

A Missing Link: Building STEAM with Literary Darwinism

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ABSTRACT

Literary Darwinism is a relatively new and controversial theory, but it capitalizes on the interdisciplinary knowledge required in our modern 21st century academe and builds upon a concept known as STEAM, the integration of the Arts into the traditional framework of Science, Technology, Engineering and Mathematics. It is, therefore, a powerful tool for both scientific and esoteric inquiry because it blurs the boundaries between disciplines, encouraging students to approach ideas of literature and evolution through creative thinking and multimodal knowledge. This article provides an introductory-level First Year Seminar (FYS) approach to teaching literary Darwinism by first building a foundational framework of key evolutionary terms, then exploring the evolution of language itself as well as literary Darwinism's relatively recent and controversial genesis within literary scholarship, and finally providing specific curricular components that facilitate synthesis of key concepts through creative thinking and interactive, STEAM-driven lessons designed to appeal to a typical FYS audience.

KEYWORDS

Literary Darwinism, STEAM, FYS

PART I: LITERARY DARWINISM AS STEAM

We've arranged a global civilization in which most critical elements profoundly depend on science and technology. We have also arranged things so that almost no one understands science and technology. This is a prescription for disaster.
--Carl Sagan

According to Sagan, 95% of Americans are scientifically illiterate. This introductory course, "A Missing Link: the Intersection of Evolution and Literature," has as its most essential goal the transformation of FYS students into a scientifically and academically literate population. As my STEAM-driven model of an FYS course

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on evolution and literature is founded on the premise that Science, Technology, Engineering, and Mathematics need story (the Arts component) in order to approach problem-solving creatively and reach a 21st century audience, students must first explore some of the evolutionary debate surrounding the possible adaptive functions of Art. Though it has been a sore subject in the evolution/intelligent design “circus” (Olson, 2009) and a talking-point strike against evolution in the classroom, the idea of “teaching the controversy” I think aptly applies when considering the relatively new field of literary criticism known as evocriticism or literary Darwinism. As one of the leading researchers in this field, Jonathan Gottschall (2012) concedes, “I don’t know for sure whether story is an evolutionary adaptation or a side effect, and neither at this point does anyone else. Science consists of repeated rounds of conjecture and refutation, and when it comes to this particular question—‘Why story?’—we are mainly in a conjectural phase” (p. 30-31). So why not engage FYS students in that conjecture while emphasizing the fine Arts in order to catalyze STEM into STEAM? By teaching the controversy, introducing students to all sides of the literary Darwinism debate, I hope to prompt critical and creative thinking, as students attempt to synthesize their own intellectual process with the story of science and then share that synthesis through the production of Art.

The thrust of the STEM to STEAM movement is sorely needed in education today. As Randy Olson (2009) argues, *On Why Scientists Need Artists*:

...science, in itself, ain’t real interesting to the broad audience. It simply isn’t enough for the general public—it’s too cold, too complex, too informational. It needs to be partnered with a more humanized element. This is why scientists need artists. The typical cynical scientist looks at the work of an artist—some sort of crazed painting or dance routine—and chuckles (...) But the work of art arouses people. It reaches down into those lower organs. Art stirs the heart, the gut, and even the loins. It motivates people. And that motivation can lead people to want to engage their brains. Which is when the scientist can go to work. Arouse and fulfill. (p. 71)

I know from personal experience as a writer that story works, story sells, and story stays, but in order to address the question of whether or not art, and story in particular, is a evolutionary adaptation or a side effect of brain development, scientists and scholars have teamed up across disciplinary lines in a STEAM-driven integrative inquiry that I will do my best to summarize here. This cutting edge research spans many disciplines, including paleoanthropological research about symbolic culture, cross-cultural ethological research of art in hunter-gatherer populations, current findings in neuroscience about how the brain processes artistic products and production, as well as current research in the fields of cognitive psychology, social psychology, childhood developmental psychology, linguistics, evolutionary psychology, and, if one goes a step further and attempts to synthesize and apply these findings directly to literature as the literary Darwinists propose, the field of literary criticism. STEAM is the pedagogical place where these disciplines meet in the general education classroom. Furthermore, STEAM requires creative

and metaphorical thinking, the highest-order process of synthesizing scientific concepts into artistic products.

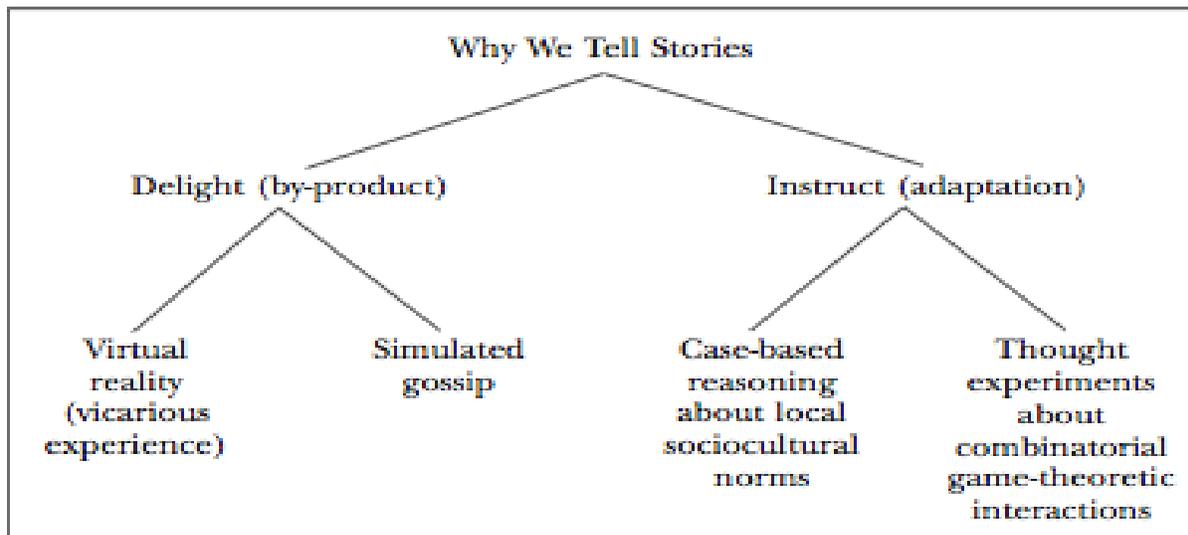
Theories abound about the possible adaptive function of literature in the context of human evolution. Stories may serve, in evolutionary terms, any, all, or none of the following adaptive functions: a means of garnering the attention of a potential mate, a way to work out possible solutions to life-sustaining problems without getting our hands dirty, an intellectual playground on which we build intellectual muscles through fun and games, a source of community-building and empathic development, a source of pleasure, an insight into the theory of mind and our shared human experience. Or stories may be a by-product of human evolution, a happy accident, or, as Steven Pinker calls it, a “cheesecake” of the mind. Or they may be a culturally constructed product of learning that serves no adaptive reproductive function whatsoever beyond the pleasure gleaned from Art for Art’s sake. In this FYS, it doesn’t really matter what theory one accepts, as long as the students in my course are engaging in the debate, thinking critically about it, and ultimately, synthesizing their understanding of evolution and adaptation through creative thinking in the Arts. In order to understand the debate, however, students must first review basic evolutionary terms (that should, in theory, be a recap of terms learned in high school biology) before being exposed to a brief overview of the adaptive function of language itself through Steven Pinker’s (1997) *The Language Instinct*, and finally establishing literary Darwinism and its various proponents and critics as the focal point of the semester’s inquiry.

According to the first official collection of scholarship in this new field, *The Literary Animal: Evolution and the Nature of Narrative* (2005), Literary Darwinists “do not see the division between the great branches of learning—the natural sciences on one side and humanities and humanistic social sciences on the other—as a fault line between two kinds of truth. They do not consider it a line at all but rather a broad expanse of mostly undiscovered phenomena awaiting cooperative exploration by scholars from both sides” (Wilson, E. O. 2005, p. vii). While this may sound promising, this relatively new field of literary Darwinism is still in its infancy, and like most early theories it is fraught with controversy, as the most recent issues of *Critical Inquiry* (Winter 2011, Winter 2012) will attest. Like the nature v. nurture and tabula rasa v. hard-wired debates of the not so distant past, this new field, an extension of those same philosophical tensions, sometimes finds itself falling prey to those most unflattering tendencies of territorialism that have impeded intellectual growth in favor of academic posturing. Theories evolve (in the popular sense of the word, at least), and as with any new field of research, each new piece of the puzzle opens more unanswered questions than it could ever hope to answer in that single, isolated moment of inquiry. However, that desire to know the unknown is the essence of scientific inquiry, and it is that desire that I seek to inculcate in the FYS classroom.

To engage in this conversation, students must be introduced to the complicated and sometimes conflicting discourse of the literary Darwinists, evolutionary biologists, and social constructivists. Some argue that story, and Art in general, is a product of sexual selection, an elaborately-penned peacock whose ultimate goal is the procurement of groupies (Geoffrey Miller, 2000), while others

such as Ellen Dissanayake (2000), Joseph Carroll (2008), and Denis Dutton (2009) all argue that the human mind's organization is enhanced by Art because they provide an emotional template for the human experience. Brian Boyd (2009) sees story as a mental jungle gym, a place where one might flex and tone brain muscles in a no-holds-barred, risk-free "playground for the mind" that enhances pattern recognition, while others such as Jonathan Gottschall (2012) argue that story is also an integral part of our shared humanity and a distinct evolutionary advantage because stories are more than just play; they function as a place for hypothetical practice, a virtual space where we can work out theories and possible solutions without having to risk our lives to experience those myriad outcomes in the real world. Furthermore, he sees stories as a social bond, the "social glue that brings people together around common values" (Gottschall, 2012, p. 28). "If the evolutionary function of fiction is—at least in part—to stimulate the big dilemmas of life, people who consume a lot of fiction should be more capable social operators" (p. 66). He goes on to cite recent psychological research that supports such a stance, and neurological research that has proven the existence of "mirror neurons" that allow consumers of stories to mirror the emotional and psychological effects they perceive in the story's characters. As an extenuation of this mirroring aspect of story, some see story as an enhancement of empathy, giving us a chance to see and feel the world from another person's perspective, and by so doing, create a shared social identity that enhances our ability to survive (Dissanayake, 2000). Even among these theoretical ramifications of the evolutionary advantages of story, scholars find even more shades of nuance. Boyd (2009) argues that the key ingredient in Art and fiction is *attention*, while Gottschall (2012) argues that it is *trouble*, though both agree on the basic premise of Art as adaptation. Literary scholar Michelle Scalise Sugiyama (2005) attempts to reverse engineer narrative into its respective parts, tracing it all the way back to its hunter-gatherer roots, and, as Steven Pinker points out in his review of her work, she "emphasizes the "instruct" function, pointing to the ways in which fiction allows audiences to acquire information, rehearse strategies, and refine skills relevant to resolving human goals in conflict. She (...) systematically brings research in cognitive science to the table, including story grammars (the rules of narrative structure) and theory of mind (the way people think as intuitive psychologists) and (...) point(s) out that the medium of literature is language; (...) for that reason, she notes, an analysis of linguistic processes is also essential to a full understanding of the psychology of fiction" (p. 174).

Steven Pinker ultimately finds the most reasonable middle ground in this theoretical minefield, for he posits that BOTH theories of Art could be correct and that they aren't, in fact, mutually exclusive, as represented in this handy graphic (2007, p. 173):



As Frederick Crews (2005) points out: “Darwin conducted himself like a member of a disciplinary community held together by a common regard for truth. We can do the same” (p. xv). My goal as an FYS instructor is not to take sides. The jury, as they say, is still out. From a writer’s perspective, I go with my gut. I have faith that story matters. For me, there’s no question that it’s hard-wired, as integral to my daily life as my opposable thumbs. I hear stories, I tell stories, I read stories, I watch stories, I interpret stories, I act out stories, I construct elaborate stories even as I sleep. If language is hard-wired, as Chomsky’s (1965) theory of universal grammar and the discovery of the “language gene” FOXP2 (Wade, 2003) would have me believe, then why all the territorial posturing over literature, the written form of the oral tradition that cave paintings and creation myths from our earliest documented ancestry have already established? Science says we need more evidence, more proof, to avoid the logical trap of my own “just-so” story. But how would one test the adaptive function of story? To deprive any experimental group of story in its many forms seems both unethical and impossible, for how would you deprive a human being of imagination, the ability to create stories in our minds without any outward evidence of their existence?

To me it matters not whether literature is adaptive, culturally constructed, or a by-product of alien invasion. I’m here to engage college freshman in the necessary intellectual development of a 21st century discourse.

While evolutionary theory does indeed contain at its essence *the* human component, students often come to science with the knee-jerk reaction of boredom. As Olson explains, “Science, like art and most other professions, requires a mixture of two elements—creativity and discipline. Science without at least a little bit of creativity is just plodding detail that does not expand our understanding of the world” (p. 132). I freely admit that Art can be stuffy and off-putting too. It can present an insular, abstract view of the world that distances itself from its audience rather than inviting them in. Indeed many modernists believed this was the goal of true Art, Art for Art’s sake, as in W. H. Auden’s “In Memory of W. B. Yeats” in which he claims

that “poetry makes nothing happen,” or Archibald MacLeish’s “Ars Poetica,” in which “A poem should be equal to: / Not true.” Artists are as culpable as scientists in this self-promoting production of monotony. That’s also why a blending of Art and science can be so profound. It captures the synthesis of scientific substance into artistic style. For in that blurred boundary lies art that *does* make something happen. It’s Art that synthesizes profound truths of our world and incites *action and reaction* among its audience. It’s that revelatory moment that matters in all writing, and as Michael Bérubé argues in his review of Boyd’s (2009) work, “The Play’s the Thing,” “Whether one prefers to say, with Emily Dickinson, “If I feel physically as if the top of my head were taken off, I know that is poetry,” or, with Boyd, “Neurons in the substantia nigra and the ventral tegmental areas of the brain secrete dopamine in reaction to the surprising but not to the expected,” is surely a matter of taste.”

PART II: WHY DYSTOPIC LITERATURE?

The following course texts were chosen to accommodate University FYS Learning Outcome 4, as follows:

- Develop a critical understanding of how literary arts (and at least one other art form, visual or performing) define and reflect human experience

The reading list for this course includes several modern dystopic novels for discussion through the lens of evolution and literary Darwinism. Dystopic fiction responds to the “utopian” counterpart with its opposing futuristic perspective, often a post-apocalyptic landscape with eerie similarities to our own. As Gottschall (2012) acknowledges, “the future is a probabilistic simulation we run in our heads in order to help shape the world we want to live in” (p. 169), so the choice of dystopic novels seems apropos. The creation of a dystopia allows readers to envision a future realistically removed from the happily ever after fairy tale, and asks a reader if that nightmarish future could theoretically be avoided, and if so, offers a reader a chance to speculate on how. These particular works were chosen for several reasons, one of which includes consideration of Steven Pinker’s (2007) critique that literary Darwinists often choose works that appeal to academics, ignoring the works consumed by the rest of the population at large. He states that:

the seldom-analyzed difference between high culture on the one hand and low and middlebrow culture is something of an embarrassment for research in the psychology of the arts. For one thing, though Darwinian literary critics aspire to invoke human universals to explain the arts, their professional standards and their personal tastes may lead them to study forms of art that appeal to 1% of the population (people like themselves) and to ignore the forms that appeal to 99%. Also, since highbrow and avant-garde genres often define themselves in defiant opposition to low- and middlebrow culture, and to the high culture of a previous period, they are bound to refute just about any generalization of the nature of art that anyone will ever make. Psychologically-oriented scholars of literature will have to get used to some

slumming, or at least give some attention to the variables that differentiate forms of literature with different levels of popularity and prestige, if for no other reason than to eliminate a source of uncontrolled variance in the phenomena they are studying. (Pinker, p. 176)

The titles I have chosen for this FYS have popular appeal to undergraduate students (see the latest *Hunger Games* craze or any of the myriad reality TV series' obsession with *Survivor*-like traits and sexual selection) and also share common elements that are particularly conducive to discussions organized around evolutionary themes: sexual selection, mutation, natural selection, adaptation, theory of mind, multilevel selection, parental investment, selective pressures, the Red Queen hypothesis, and game theory. Furthermore, the fact that these stories predict a future world allows students to put their own creative, critical, abstract and speculative thinking skills to the test as they posit the "future" of humanity and our evolutionary story.

The following provides brief plot synopses and explication of Darwinian themes in the following dystopic novels: *Galapagos* (1985), *Oryx and Crake* (2003), *The Year of the Flood* (2009), *The Road* (2006), and *X-Men: God Loves, Man Kills* (1983):

Galapagos: In Kurt Vonnegut's postmodern satire, he gives us a glimpse into the future, a million years into the future, where he posits that our big brains have been selected out of the human genome in favor of flippers, fur, smaller streamlined heads with smaller streamlined brains, and teeth that are now more adept at catching fish than conversing. Vonnegut argues that our big brains are the source of the environmental, political, and social destruction of our world, and we'd be better off without them. "That, in my opinion, was the most diabolical aspect of those old-time big brains: They would tell their owners, in effect, 'Here is a crazy thing we could actually do, probably, but we would never do it, of course. It's just fun to think about.' And then, as though in trances, the people would really do it" (p. 291). So, thanks to a genetic mutation spawned by the atomic bombs of World War II, a small group of lucky/unlucky tourists find themselves shipwrecked on the fictional island Santa Rosalia in the Galapagos, an island known for vampire finches, where this unlikely band of misfits avoid the self-inflicted extinction of the rest of the big-brained human race in World War III and give birth to a furry little infant who becomes the mother of the new human race of seal-like fisherfolk. This text is particular fodder for discussion in light of the social constructivist postmodern theoretical camp from which the author hails, and the tension that arises between that belief in chaos, chance, and social free will upheld by the narrator of the story even in the face of the obvious biological determinism enacted by the characters who repopulate the earth (or at least the Galapagos Islands) after World War III.

Oryx and Crake and *The Year of the Flood*: In parts one and two of Margaret Atwood's recent Maddaddam Trilogy, Atwood establishes an imaginary American society in the near future where genetically altered species such as pigoons and wolwogs have broken free of their scientist's labs and run wild, and a genetically

engineered line of new and improved humans called the Children of Crake are poised to repopulate the earth after biological terrorism lays waste to the majority of humanity. The heroes of these novels must exhibit those traits that led to human survival and evolution in the first place: cooperation, adaptation, and ingenuity. These novels also bring to light some interesting connections with Gottschall's theory of story's adaptive function, for Art, poetry and music seem as integral to the collective survival of Atwood's hypothetical humanity as food and shelter.

The Road: In Cormac McCarthy's barren landscape of a possible nuclear winter, we see a world devoid of life, save for a few scattered human survivors. In spare language and haunting imagery that parallels the sparse and silent ecosystem, McCarthy follows a boy and his father as they struggle onward through the "scabland," fighting against starvation in search of other "good guys." With the Darwinian themes of basic hunter and gatherer survival, parental investment, and the competing forces of selfishness versus altruism that fuel a constant internal battle of cost/benefit analysis in the mind of the man who carries his son's fate in his hands, *The Road* unspools before the reader in a heart-wrenching narrative of human need in an all too real dystopic future. In fiercely poetic prose, McCarthy captures it: "Perhaps in the world's destruction it would be possible at last to see how it was made. Oceans, mountains. The ponderous counterspectacle of things ceasing to be. The sweeping waste, hydroptic and coldly secular. The silence" (p. 274). But it isn't only basic physical need that makes this novel so compelling, but also the spiritual, emotional, and intellectual needs of hope and human touch, of childhood play, stories, dreams, and colors. "The world shrinking down about a raw core of parsible entities. The names of things slowly following those things into oblivion. Colors. The names of birds. Things to eat. Finally the names of things one believed to be true. More fragile than he would have thought. How much was gone already? The sacred idiom shorn of its referents and so of its reality. Drawing down like something trying to preserve heat" (p. 89).

X-Men: God Loves, Man Kills: In this groundbreaking installment of the X-Men saga, Chris Claremont and Brent Anderson's themes of multilevel selection, mutation, biological determinism and altruism hover in the subtext of a graphic novel in which enemies must band together to stop the genocide of "Muties" by the Stryker Crusade and its devout leader. Stunning visuals capture a uniquely retro futurescape that bears a striking resemblance to 1983 New York, and through universal human emotions of fight and flight, this graphic novel asks complicated questions about the cultural evolution of morality, religion, and altruism in a world where Mutants symbolize much more than fantasy superheroes.

Part III: CURRICULAR COMPONENTS

The following course assignments were designed to accommodate FYS Learning Outcomes with course instructional goals in the following cognitive areas of professional and academic development:

- Critical Thinking
- Creative Thinking
- Collaborative Learning
- Interdisciplinary Communication

The following assignments assess student progress in relation to FYS Learning Outcomes 1-4:

1. The ability to communicate effectively in writing
2. The ability to find, retrieve, analyze, and use information effectively
3. Develop a critical understanding of how literary arts (and at least one other art form, visual or performing) define and reflect human experience
4. Apply knowledge and skills to the issues and problems of contemporary American society and the world

To assess any STEM or STEAM curriculum, Ostler points out that integrative learning occurs when “students ask questions, design experiments, create products, test results, and evaluate conclusions...not just take tests” (p. 32). The following projects attempt to do just that. The University’s FYS Learning Outcomes have multilayered goals designed to prepare students for other general education courses as well as upper-division discipline-specific coursework by creating an intellectual foundation for critical thinking, reading, and writing that provides scaffolding for lifelong learning and professional careers beyond undergraduate educational experiences. Upon completion of this FYS course, students should be able to: effectively employ analytical, critical, and creative thinking skills and information technology to find, interpret, and evaluate information discerningly; demonstrate effective critical thinking, reading, and writing skills through written, oral, and visual communication in diverse settings and groups; effectively synthesize related ideas and concepts across disciplines; work collaboratively with diverse groups of peers to implement research projects of their own design, then translate their findings into interdisciplinary artistic products; develop a critical understanding of how literary Darwinism defines and reflects human experience through literature and the fine Arts.

By blurring the boundaries between disciplines, students begin to see that creative problem-solving requires multimodal knowledge. The integration of one discipline’s skill set to another uncovers new ways of thinking about and interacting with our intellectual world. Creative problem-solving, collaboration, and analytical reasoning skills are applicable in all disciplines, and as 21st century citizens face a society more technologically evolved and culturally diverse than any before, the ability to effectively communicate one’s ideas to an ever-changing audience could be considered the most sought-after trait among college graduates today.

ASSIGNMENT 1: *LOST IN TRANSLATION**

(Originally conceived as a BEACON module for a grant project led by Dr. Randall Hayes at North Carolina A&T State University, 2010-2011)

Man has an instinctive tendency to speak.
--Charles Darwin, *The Descent of Man*

This assignment begins with an essential question: If language evolves, what traits are gained and lost along the way? This introductory exercise is designed to get students thinking about evolution outside of the biological realm, using online technology including the *Google Translator* tool and the *Google Ngram* tool to reflect on the changes in language over time. Students will choose words and phrases that fall into the categories of aphorisms (ex. the early bird catches the worm), euphemisms (ex. pushing up daisies), clichés (ex. trials and tribulations), and scripture (ex. “my Father who art in heaven, hallowed be thy Name”) to compile a wiki web of language that tracks the evolution of such phrases over time and across languages, dialects and cultures. Students must also take into account the various stages of the English language as it evolved from Old English to our modern tongue, and consider the implications of meaning as a dynamic concept, capable of *variation*, *adaptation*, and *selection*, rather than a static and unchanging entity.

The assignment is built upon a playful linguistic foundation begun on the first day of class with a “Euphemism Game” played by students in collaborative teams; this playfulness continues with the *Lost in Translation* assignment and this premise for class discussion:

Imagine that you are about to embark on a semester abroad. Are you fluent in the language spoken by the majority of the population there? Even if you are, do you think you will find communication in this non-native language smooth and easy from day one? Whether we realize it or not, we speak a multitude of languages every day, even if our only language is English. Think about it: though it’s all “English,” we vary vocabulary, syntax, inflection, and levels of formality to meet the needs of a particular audience at a particular time and place. Do you write a Facebook status update the same way you write an email to a potential employer? Do you use the same language at a party on Thursday night that you use in chapel on Sunday morning? When you call home to ask for money, do you approach the conversation differently if Mom answers the phone than you would if Dad answered? I thought so! In this project we will explore the ways in which language evolves by first investigating various words and phrases through the use of modern-day technological tools. Then we will synthesize our findings within a broader discussion of language as a dynamic entity, capable of change due to the external pressures of the environment and the internal pressures of our own rhetorical cleverness: devices such as nuance, sarcasm, subtext, euphemism, metaphor, and irony that can often leave us

lost in translation. (A. Walker FYS 1000 *Lost in Translation* Assignment Prompt Premise)

The overall goals of this project include:

- Crafting a “revelatory thesis” that attempts to “radically re-see” language through the lens of evolution
- Analyzing particular phrases that are particularly problematic in translation because of their social, cultural, historical, and idiosyncratic contexts
- Engaging in an intellectual discussion of the evolution of language through mechanisms of variation, adaptation, selection, and inheritance
- Utilizing electronic resources to substantiate a rhetorical argument
- Communicating those results effectively in writing

After translating their chosen words and phrases across multiple languages with Google Translate, and then tracking those words and phrases over time with the Google Ngram Viewer, students compose a wiki entry that analyzes their chosen phrases, addressing how and why they might be particularly problematic in translation because of their social, cultural, historical, and idiosyncratic contexts. In this response, students engage in an intellectual discussion of the evolution of language through evolutionary mechanisms by reflecting on the similarities and/or differences in the phrase across language barriers and time periods after it has been translated a number of times and imported/exported across cultures. They must also take into consideration the difficulty a human being would have when trying to “learn” a language and interpret meaning if he or she were only given limited contextual clues (like a time period) and denotative meanings (like a dictionary) rather than the additional context and subtext provided by body language, facial expression, inflection, and knowledge of the social and cultural customs of the speaker. Finally, they must apply their newfound understanding of language by situating their findings within a broader evolutionary context; considering the various stages of the English language as it evolved from Old English to our current modern tongue, students are asked to predict language’s evolutionary future.

This project is assessed with the FYS 1000 Critical Thinking Rubric (see Appendix), which evaluates the student work based on five essential criteria: explanation of issues, evidence, influence of contexts, student’s position, and implications and consequences. These criteria are assessed according to the following levels of achievement: underdeveloped, developing, competent, and masterful.

To demonstrate student success and mastery of the established criteria for critical thinking, see the Appendix for a student example of the *Lost in Translation* assignment that explores the evolutionary etymological roots of the following phrases: karma is a bitch; absence makes the heart grow fonder; batting for the other side; and keep up prayer in the two parts of the day and in the first hours of the night; surely good deeds take away evil deeds this is a reminder to the mindful (The Holy Prophet 11.114 *Koran*).

ASSIGNMENT 2: STEAM SHUFFLE

Give me steam
And how you feel to make it real
Real as anything you've seen
Get a life with this dreamer's dream
--Peter Gabriel, "Steam"

This assignment begins with an essential question: If this class were a song, what would it sound like? As Gottschall (2012) admits in *The Storytelling Animal: How Story Makes Us Human*, "The idea for this book came to me with a song" (p. xiv). Clearly this is yet another example of STEAM, a moment in a scholar's life when Art enables creative scientific thought and leads to a new and unexpected "aha!" moment. He notes that one silly country song, a genre he doesn't even typically listen to or like, "had melted me—a grown man, and not a weeper—into sheer helplessness. How odd it is, I thought, that story can sneak up on us (...) alter the way we imagine ourselves and our world. (...) The story maker penetrates our skulls and seizes control of our brains" (p. xv). This project collaboratively constructs a musical map of the semester and the topics students read, see, and talk about each week by effectively summarizing and interpreting a major Darwinian theme of an assigned text and then synthesizing its meaning through music. Any time students have an epiphany sparked by an assigned reading, they are asked to make a musical connection from that textual reference to a familiar song track. This will help them remember what they've read, explore the connection between emotion, narrative, music and memory, enable discussion of whether or not the Arts (including story and music) are adaptations, and also encourage other students to make the story/music connection too. By the end of the semester, the class will have a soundtrack of the course to download to their own mobile music device, and a collaboratively constructed academic analysis of each track's significance as a signpost at the intersection of assigned readings, music lyrics, and evolutionary concepts.

The assignment is built upon a musical and philosophical foundation begun with aesthetic philosopher Denis Dutton's critically acclaimed interdisciplinary exploration of *The Art Instinct* and Margaret Atwood's *Year of the Flood*, which includes "hymns" sung by the cult known as "God's Gardeners" that blur the boundaries between biological science and religious doctrine. (See <http://www.yearoftheflood.com/us/music/> for more information regarding these audio recordings by Margaret Atwood and Orville Stoeber). This conversation continues with the *STEAM Shuffle* assignment and this premise for class discussion:

How many songs do you know by heart? 100? 1,000? 10,000? Perhaps it began with "Twinkle, Twinkle Little Star" before you could even walk, and now it extends to your latest musical obsession. And your amazing retention of songs and lyrics isn't even limited to only songs you like! Just admit it, you know every word to "Call Me Maybe." Unless you've been living under a rock somewhere for the past year, you've found yourself singing along to this

infuriatingly catchy tune at some point. So if we can recall, word for word, the tunes and lyrics to songs we heard last night as easily as we recall those we haven't heard in years, regardless of whether or not we even *like* the song, why can't we remember what we read last night? This project will attempt to solve that problem. Some scientists believe that music is hard-wired from birth, as instinctual as baby talk or a sweet tooth. It's clear that music makes our brains light up in multiple regions, and this biological reaction to musical stimulation varies drastically from the reaction of our brains to textual stimulation. Music is tied to emotion and memory, and in this project we will attempt to map our collective learning process with music, creating a shared neural pathway to aid recall and enjoyment of the concepts we discuss in class and read about in the assigned texts. This STEAM-driven playlist will enhance our understanding of evolution, challenge our interpretive abilities, and encourage us to share our insights with others. (A. Walker FYS 1000 *STEAM Shuffle* Assignment Premise)

The overall goals of this project include:

- Crafting a “revelatory thesis” that attempts to “radically re-see” an assigned reading through the lens of musical and evolutionary theory
- Effectively summarizing and interpreting a major evolutionary theme of a text and then synthesizing its meaning through music
- Utilizing print and electronic resources to substantiate a rhetorical argument
- Communicating those results effectively in writing

Students must connect the interdisciplinary dots in order to make this assignment work. Before they can apply the aesthetic interpretation of a song to an evolutionary context within an assigned course reading, they must be able to effectively analyze both the chosen reading and the chosen song lyrics for symbolism, imagery, rhythm, voice, and other literary values. In addition to that textual analysis, students must also engage with the sonic aesthetics of the chosen song. To do so, they might incorporate research from current music theory or other scientific findings about auditory mechanisms, processes, and responses, or even anthropological and historical case studies of world music cultures. They might consider questions such as these: How might one Art form inform another? How does a song's sound (tone, mood, rhythm, pitch, dynamics, etc.) influence the listener's experience? Does the sound support the meaning of the lyrics, or does it stand in contrast to them? Once students have accumulated evidence in support of their interdisciplinary argument, they share this connection with the class in an online wiki forum. At the end of the semester, I burn the song tracks as a course playlist and distribute them to the class as a creative take away, ensuring that they will always remember our collaborative STEAM-driven musical connections.

This project is assessed with the FYS 1000 Critical Reading Rubric (see Appendix), which evaluates student work based on six essential criteria: comprehension, interdisciplinarity, relationship to text, analysis, interpretation, and

reader's voice. These criteria are assessed according to the following levels of achievement: underdeveloped, developing, competent, and masterful.

To demonstrate student success and mastery of the established criteria for critical thinking, see the Appendix for a student example of the *STEAM Shuffle* assignment.

ASSIGNMENT 3: HUNTER AND GATHERER POETRY

Any healthy man can go without food for two days - but not without poetry.
--Charles Baudelaire

This assignment begins with an essential question: How might poetry enhance our appreciation of evolution? Overall, this project is designed to collaboratively construct a poetic map of the semester by interpreting, in lyric form, major Darwinian themes, tones, scenes, characterizations, and dialogues presented in our assigned readings. A found poem is a collage of words that the author borrows from a published text and then shapes into a poem. These inquiries are guided by a main idea, story, character, theme, motif, or setting chosen by the student that connects to the common Darwinian themes discussed throughout the course; as a hunter and gatherer of language, the student then highlights words or phrases that relate to that topic, and afterward pulls significant words or phrases out of the highlighted prose and reconstitutes them in poetic form, shaping a poem that conveys a message through sensory detail and uses the tools of poetry (line breaks, meter, rhythm, repetition, imagery, metaphor, syntax, persona, diction, etc.) to reinvent the original text in a new artistic mode. In this way the student's own artistic intentions converse with those of the original author to create a new literary aesthetic that honors the integrity of the first text and also adds a layer of scientific artistry to it, enabling the student's synthesis of a selected Darwinian theme through an artistic representation of it.

The assignment is built upon a poetic foundation begun with Denis Dutton's *The Art Instinct*, Margaret Atwood's *Year of the Flood*, and Cormac McCarthy's stunning prose style in *The Road*. This conversation continues with the *Hunter & Gatherer Poetry* assignment and this premise for class discussion:

Imagine the life of a hunter and gatherer of the Pleistocene era: survival depends on your ability to glean sustenance from the environment that surrounds you, to collaborate with your group to reach shared physical, emotional, and social goals, and to use your own creative intellect to solve the problems of daily life. This project will attempt to do the same, metaphorically speaking. First, you will collect the vital sustenance from a text we read in this course. You may wish to highlight bits and pieces of prose that catch your eye as you read. Then you will organize them into a **found poem** and share that with the rest of the group through our Class Blog link. This project will require your creative intellect to solve the myriad problems of adaptation—the artificial selection of the “genetic material” that will comprise your poem, the translation of one art form into another, the

ethical tensions that arise from creative sampling, and the social implications of audience perception—in order to succeed as a poem.

The overall goals of this project include:

- Collecting evidence of an evolutionary concept from an assigned course reading
- Engaging in an intellectual and artistic endeavor that translates that evolutionary concept into poetic form
- Honoring the integrity of the original text with responsible source attribution, while adding a unique artistic voice to the conversation
- Communicating those results effectively using poetic devices and tools

Students must connect the interdisciplinary dots in order to make this assignment work. Before they can apply an aesthetic interpretation of an assigned reading to an evolutionary context, they must be able to effectively analyze both the chosen reading and the potential product, their found poem, for symbolism, imagery, rhythm, voice, and other literary values as well as the big picture scientific values gleaned through the lens of literary Darwinism and evolutionary theory. In addition to that close reading and meta-textual analysis, students must also engage with their own aesthetic choices as they translate one Art form into another.

This project is assessed with the FYS 1000 Creative Thinking Rubric (see Appendix), which evaluates student work based on six essential criteria: acquiring competencies, taking risks, solving problems, embracing contradictions, revelatory thinking, and synthesis. These criteria are assessed according to the following levels of achievement: underdeveloped, developing, competent, and masterful.

To demonstrate student success and mastery of the established criteria for creative thinking, see the student examples of the *Hunter & Gatherer Poetry* Assignment below.

Student Example: *Where All is Burnt to Ash*

Love and protection have been a part of evolution since the beginning of time. It's that basic substance of parental investment. A parent's love for their child is one of the strongest bonds formed, for human offspring stay with their parents longer than any other species. This is one of the contributing factors to our growth as a species. We are a social species that relies on one another for survival; it is a selective pressure and an evolutionary advantage. This is explained by Game Theory; we are grouped into communities of people, such as a family, and rely on that family for security. This poem is about the love a father has for his son, even in death.

Where All is Burnt to Ash

What would you do if I died?
To take your life
Is like no sound, a dull sun
He kept the boy close to his side

EvoS Journal: The Journal of the Evolutionary Studies Consortium
ISSN: 1944-1932 - <http://evostudies.org/evos-journal/about-the-journal/>
2013, Volume 5(1), pp. 15-50.

What would you do if I died?
The boy clung to him crying
His arms out-held he caught him
Issues resolved into nothingness

What would you do if I died?
Arm-load of fire blackened wood
In a fine mist of grey snow
Their feet wet and cold

What would you do if I died?
He held the boy shivering against him
Cold and growing colder
He built a fire in the floor

What would you do if I died?
He pulled the blanket over him
Leaving the boy sleeping
Keeping constant watch

What would you do if I died?
He dreamt of walking in a flowery wood
All of it slowly fading from memory
Like the dying world the newly blind

What would you do if I died
He leaned his nose in
Tolling in the silence of the earth
Counting each frail breath in the blackness

What would you do if I died?
I would want to die too
The boy stared into the light
With eyes dead white and sightless

What would you do if I died?
Looking for anything of color
Any movement.
He took the pistol from his belt

What would you do if I died?
I would be with you
Motionless and precise
Ghostly pale, the fire faded

—found poem excerpted from *The Road*, by Cormac McCarthy.

Student Example 2: *Warmth of Hope*

The coevolution of man and fire has created a unique and important bond between the two. Our primal attraction to fire derives from its ability to warm us, feed us, entertain us and protect us. As destructive as fire can be, it can also burn a path for new life to exist. In the book *The Road* by Cormac McCarthy, fire plays a crucial part in the survival of the father and his son. The consistent fires that the father makes every night to sleep by instill the sense of safety and warmth that fire provides. The relationship that the father, son and fire share provides a perfect example of how fire can inspire hope, whether the fire is keeping them warm, defining them as the "good guys", cooking food or protecting them from enemies. In this post-apocalyptic world deprived of color, the red and orange flame draws attention and respect. We see that just as fire can change the circumstances of survival, hope will too. The metaphor of carrying the fire, the hope, is something that the father teaches his child in order to survive. This hope will keep him alive, and pass the fire on to the dark corners of their ash-covered world.

Warmth of Hope

The ashes of the late world
Carried on the bleak and temporal winds
The cold and the silence
Old dreams encroached upon the waking world
Everything too wet to make a fire
Wrapped in the blankets
The nameless dark comes to enshroud them
Don't let it get cold
We have to have a fire
The shapes of the small tree limbs
Burning incandescent orange in the coals
The red spark rose in a shutter
A fading light
Died in the blackness overhead
He blew the flames to life
It's inside you
Don't lose heart
You have to carry the fire
Warm at last
It was always there

—found poem excerpted from *The Road*, by Cormac McCarthy.

Student Example 3: *Motions of Life: Uncounted & Uncalendared*

The goal of this found poem connects with many Darwinian themes, but the main ones I wanted to highlight were Dutton's universal literary plots of "overcoming the monster" and "rebirth." I also wanted to share both the father and the son's perspectives, therefore in the first stanza, although the language is more mature

than the boy's commentary in the book, it shows him reminiscing about his father. Then in the second stanza the voice shifts to the father until the end of the third stanza where the final lines begin with the boy. It displays rebirth very well because the poem could act as a cycle, since death is inevitable, the son is reminiscing about his father, the son later becomes a father and he aims to protect his son, but ultimately he will die, leaving this son to reminisce about him. And so on, and so on. If the poem is read twice, jumping directly from the final line to the third one in the first stanza, the words continuously flow as a cycle. "Rebirth" is shown with the construction of the poem and "overcoming the monster" is shown in the language within the poem. The story won't always be the same, but it is likely that the cycle will remain, especially if humans were stuck (for many years) in a situation similar to the one presented in *The Road*. The poem also shows "basic subsistence" and "Pleistocene instincts" by highlighting the father's goal to protect his son and the goal to procure food.

Motions of Life: Uncounted & Uncalendared

You said you would never leave me
The days sloughed past uncounted and uncalendared
[But] you said you would never leave me
[We] went to the top of the hill
Where the road crested
Where [we] could see out over the darkening
Ate cold rice and cold beans
Ruins of [towns] took the road south
Frozen mud like formations
Dead trees standing out of the gray
The ground was trembling
Papa
I'm really scared
Papa
I'm really hungry
Raw
Naked
Filthy
Starving
[Under] the crushing black vacuum of the universe
Shoals of ash
Billows of ash
How long do you think people can go without food?

We don't eat people
We sit
Starved and threadbare
[Kicking] through the trash in the aisle of a foodmarket

We have to keep going
Sooner or later they will catch us
And they will kill us
Eat us
There's a lot of them,
The bad guys,
[They] eat people

[We] scavenged
Whatever we can find
Handfuls of some grain
Cocoa scavenged weeks before
Cans of vegetables and of fruit
The boy was all that stood between [me]
And death
[I] woke in the black and freezing waste
Out of softly colored worlds
The songs of birds
The sun
So rich in color
Just a dream
Good dreams are not a good sign
[I'm] going to die
Like the dying world
I can't hold my son dead in my arms
He needs to go on
Crying
And weak
Carrying the fire
[But] you said you would never leave me
The days sloughed past
Uncounted
And uncalendared

- found poem excerpted from *The Road*, by Cormac McCarthy.

Student Example 4: *The Spark Created by Life; The Flame Extinguished by Humans*

A three foot by four foot section of turf.
This small area of land bursts at the seams with more life than one can imagine!
Eight orders
Eighteen genera
Twenty species of plants

All of these genera innumerate into more and more species
 Sparking more and more life
 Adding to the rolodex of species.
 This growth happening exponentially
 turning exponentially more beautiful!
Then the human enters, taking control, making his own spark of life
Limiting the traits of desire to the fastest, most powerful, most useful
 All for himself.
 Nature does not care who is more useful!
It cares about moving forward to help the species grow and become better adapted.
 It cares about survival.
 Perhaps not more important than the nature of the spark...
 [but] the nature of the flame.

—found poem excerpted from *The Origin of Species*, by Charles Darwin.

ASSIGNMENT 4: EVOLUTION REVOLUTION

Whoever is lead to believe that species are mutable, will do good service by conscientiously expressing his conviction, for only thus can the load of prejudice by which this subject is overwhelmed, be removed.

--Charles Darwin, *The Origin of Species*

This capstone assignment begins with two essential questions: Can you survive 48 hours without an essential human adaptation? And if you translated that 48-hour experience into Art, what would it look or sound like? Overall, this collaborative team research project includes scientific observation, research, self-experimentation and an Artistic rendering of the team's findings supported by an academic introduction that explains the adaptive function chosen by their team for further study. After reviewing the metaphor of evolution and Darwinian themes analyzed in literature from the interdisciplinary perspective established over the course of the semester, teams pick an aspect of "adaptation" they are all willing to adopt or sacrifice over a 48-hour period. All of the team must agree on the choice. Before completing 48 hours of self-experimentation, students observe the University campus population and reflect on the ways in which their chosen aspect of adaptation influences behaviors, social interactions, and ultimately, the survival of the "college student" species. Once all members have completed their 48 hours of self-experimentation, they work together to compile a report of the findings. Finally, the team collaborates on an Artistic rendering of those findings and a written introduction to this work of Art that establishes the specific adaptive function of their chosen adaptation as well as an explanation of their chosen Artistic mode and its possible overall adaptive function for humanity. Teams may choose any mode of Art (dance, drama, film, poetry, visual/studio art, sculpture, etc.).

The overall goals of this project include:

- Crafting a “revelatory” hypothesis that attempts to “radically re-see” an evolutionary adaptation through the lens of art
- Analyzing an adaptation through scientific observation, self-experimentation, academic research, and artistic expression
- Engaging in an academic analysis of the adaptation that utilizes electronic and print resources to substantiate a rhetorical argument
- Communicating those results effectively in an artistic rendering of the results that includes a written academic introduction

This assignment is broken down into two parts, with Part 1 involving the self-experimentation 48-hour project, and Part 2 the creation of an artistic product that renders the experimental findings into a concrete, STEAM-driven work of Art that is situated within a literary Darwinist framework and defended successfully by a collaboratively written academic introduction or literature review. To begin, students are divided into teams. Ideally, each team consists of about five individuals, though I’ve had success with this project in groups as small as three or as large as ten. Teams are asked to review the course literature regarding literary Darwinism and pick an adaptation that they are willing and able to sacrifice for 48 hours. Before they can make a decision, students must first discuss the term “adaptation” to determine what sorts of things qualify. This usually includes a heated semantic debate about the variations in meaning biologically, socially, and culturally. Some examples chosen by students include: opposable thumbs, fire, the wheel, small group cooperation, eye contact, binocular vision, the hunter and gatherer diet, teeth, eating utensils, shoes, music, verbal communication, and written communication. All of the team must agree on the choice, and no adaptation may be chosen that causes undue physical or emotional discomfort to any individual. Should a team member feel excessive discomfort, he or she must discontinue the experiment immediately without fear of retribution or penalty and reflect on the implications of this experience in his or her observation notes. While teammates should provide moral support for one another during the 48 hours, the experiment must be completed on an individual basis. Teams are allowed to choose synchronous or asynchronous implementation of the 48-hour experiment, and both logistical time frames have resulted in successful outcomes. It is important, however, to stress that students tell friends and family about this assignment in advance so they don't hurt anyone's feelings or have their behavior misunderstood. Ultimately, it's an Honor System, so only the students can know for sure if they followed through for the full 48 hours. The collaborative team dynamic of the course tends to work as an effective selective pressure for this project, though our relatively small size as a University (3,689 undergraduate students, with 99% of the 2012 Freshman class living on campus) does mean that these students are often quite visible to the University community at large if they choose to complete the 48 hours synchronously on campus (see the Appendix for a detailed statistical breakdown of the 2012 Freshman class demographics at this particular private Liberal Arts institution).

Once teams have completed the 48-hour experimentation process, they are then asked to reflect on that experience collectively and analyze their findings from

a point of critical and scientific distance. Then they must synthesize those findings through an artistic medium of their choice. The first part of the project, the 48-hour self-experiment, asks students to apply their knowledge outside the classroom and engage with course concepts in the real world setting of their own daily lives, while the second part, the artistic rendering and academic introduction, requires the most in-depth interdisciplinary scholarly research and critical analysis of the semester in the form of a Literature Review. This literature review sets the teams' chosen 48-hour experiment and artistic rendering in a broader intellectual context. The review must bring readers up to date on the main premise of literary Darwinism chosen by the team and then synthesize those ideas and findings from prominent evolutionary scholars and literary figures into their own rhetorical argument by applying them to their artistically-derived product. Teams must explore the theoretical background of their art form, and explain the academic evolutionary foundation upon which the team built this shared artistic vision.

This capstone project concludes with an "Evolution Revolution Art Show" in which all teams present their works of Art to the class and the broader University community in a moderated gallery exhibition. Here are a few examples from the Fall 2012 semester:

Student Example 1: *Utensils as a Cultural Adaptation*



EvoS Journal: The Journal of the Evolutionary Studies Consortium
ISSN: 1944-1932 - <http://evostudies.org/evos-journal/about-the-journal/>
2013, Volume 5(1), pp. 15-50.

Student Abstract:

Utensils have culturally adapted alongside the human race, from our primitive utensil-lacking ancestors to the modern utensils we employ on a daily basis. This process can be labeled as a co-evolution of sorts, and through the forty-eight hour experiment without utensils (and subsequent art project) our team has determined several conclusions about the history, use, and cultural evolution of utensils as a whole, a transformation that occurred in tandem with that of human food and society. All of these changes, the shift toward a more advanced and well-mannered society as well as the shift to a diet of more diverse and complex culinary tastes, promulgated the necessity of utensils.

Student Example 2: *Life Without Opposable Thumbs*



EvoS Journal: The Journal of the Evolutionary Studies Consortium
ISSN: 1944-1932 - <http://evostudies.org/evos-journal/about-the-journal/>
2013, Volume 5(1), pp. 15-50.

Student Excerpt in response to this project:

Living forty-eight hours with a simulated lack of thumbs was more than just inconvenient, uncomfortable and restraining. It allowed me to experience a different perspective on our evolutionary history. I observed that society has culturally evolved to meet the needs of biological adaptations, such as opposable thumbs, that occurred long ago. Specifically, not being able to use my thumbs for two days taught me that even the most mundane technology of today, such as forks, spoons, and cell phones, would be rendered virtually useless without our opposable thumbs. This experience allowed me to see first-hand the relationship between cultural and biological evolution, and also allowed me to gain an enormous amount of respect and empathy for those whose physical conditions might turn the seemingly positive technological developments of our era into a physical burden that undermines their quality of life.

The first part of this project is assessed with the FYS 1000 Creative Thinking Rubric (see Appendix), which evaluates student work based on six essential criteria: acquiring competencies, taking risks, solving problems, embracing contradictions, revelatory thinking, and synthesis. These criteria are assessed according to the following levels of achievement: underdeveloped, developing, competent, and masterful. The second part of this project is assessed with the FYS 1000 Critical Thinking Rubric (see Appendix), which evaluates the student work based on five essential criteria: explanation of issues, evidence, influence of contexts, student's position, and implications and consequences. These criteria are assessed according to the following levels of achievement: underdeveloped, developing, competent, and masterful.

CONCLUSION

As Joseph Carroll states in a blog post response to Jeff Turpin:

We have all had moments in which some song, story, or play, some film, piece of music, or painting, has transfigured our vision of the world, broadened our minds, deepened our emotional understanding, or given us new insight into human experience. Working out from this common observation to a hypothesis about the adaptive function of literature requires no great speculative leap. Literature and the other arts help us live our lives. That is why the arts are human universals. In all known cultures, the arts enter profoundly into normal childhood development, connect individuals to their culture, and help people get oriented to the world, emotionally, morally, and conceptually.

Even if such "evidence" is still circumstantial and difficult to quantify with the hard evidence required by the rigors of the scientific method, under the banner of STEAM, this FYS approaches evolution through an exciting new mode of creative thinking that seeks to integrate the Arts and Humanities into the realm of scientific

inquiry by applying evolutionary theory to the realm of literary criticism. By introducing the theory of literary Darwinism beyond basic biology as a metaphorical lens through which one can view language and literature, students gain a new perspective on this dynamic, interdisciplinary field. The course concludes with a collaborative experiment in which students produce a multimodal collection of *STEAM*, bridging the gap between Science and Art and sharing their findings with a broad populace.

Randy Olson sees this sort of integrative storytelling as the new priority for science communication in the 21st century because a prominent segment of our population dismisses or devalues scientific knowledge. He echoes Carl Sagan's dire warning when he states: "An entire anti-science movement has emerged that truly does threaten our quality of life. (...) In the midst of this conflict, communication is not just one element in the struggle to make science relevant. It is *the* central element. Because if you gather scientific knowledge but are unable to convey it to others in a correct and compelling form, you might as well not have bothered to gather the information" (p. 9).

In the context of this FYS, the formation of effective critical reading, writing, and speaking skills enables students to engage with the learning process by blurring the boundaries between disciplines. Students begin to see that creative problem solving requires multimodal knowledge; this integration of one discipline's skill set to another uncovers new ways of thinking about and interacting with our intellectual world. Creative problem-solving, collaboration, and analytical reasoning skills are applicable in all disciplines, and the ability to effectively communicate one's ideas to a diverse and ever-changing audience through multiple modes and media could be seen as the most sought-after trait among the 21st century graduates of today. With this newfound STEAM, students will enter a workforce more technologically advanced and culturally diverse than any that have come before, armed with the intellectual tools necessary to communicate their work to a mainstream audience, and, hopefully, make them care.

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REFERENCES

AAC&U VALUE Rubrics <http://www.aacu.org/value/rubrics/index.cfm>
Atwood, M. (2003). *Oryx and Crake*. New York: Anchor Books.
Atwood, M. (2009). *The year of the flood*. New York: Anchor Books.

EvoS Journal: The Journal of the Evolutionary Studies Consortium
ISSN: 1944-1932 - <http://evostudies.org/evos-journal/about-the-journal/>
2013, Volume 5(1), pp. 15-50.

- Auden, W. H. (1939). In memory of W. B. Yeats. Retrieved from <http://www.poets.org/viewmedia.php/prmMID/15544>
- Baudelaire, C. (nd). Retrieved from <http://www.brainyquote.com/quotes/quotes/c/charlesbau100770.html>
- Bérubé, M. (2010). The play's the thing. *American Scientist*. January-February 2010.
- Boyd, B. (2009). *On the origin of stories: Evolution, cognition, and fiction*. Cambridge: Harvard University Press.
- Boyd, B. (2005). Evolutionary theories of art. In J. Gottschall & D. S. Wilson (Eds.). *The Literary Animal: Evolution and the nature of narrative*. (pp. 147-176). Buffalo, NY: Northwestern University Press.
- Bryson, B. (1990). *The mother tongue*. New York: Harper Perennial.
- Carroll, J. (2009) RE: [CogLAs] [biopoet] Bérubé review Boyd. Post to Yahoo Groups: Biopoet-Biopoetics. Retrieved from <http://groups.yahoo.com/group/biopoet/message/618>
- Chomsky, N. (1965). *Aspects of the theory of syntax*. Boston: Massachusetts Institute of Technology.
- Claremont, C. & Anderson, B. A. (1983 & 2011). *X-men: God loves, man kills*. New York: The Marvel Comic Group.
- Crews, F. (2005). Foreword from the literary side. In J. Gottschall & D. S. Wilson (Eds.). *The Literary Animal: Evolution and the nature of narrative*. (pp. xiii xv). Buffalo, NY: Northwestern University Press.
- Darwin, C. (1871). *The descent of man*. New York: D. Appleton and Company.
- Darwin, C. (1991). *The origin of species*. Buffalo, NY: Prometheus Books.
- Dissanayake, E. (2000). *Art and intimacy: How the arts began*. Seattle: University of Washington Press.
- Dutton, D. (2005). Afterword. In J. Gottschall & D. S. Wilson (Eds.). *The Literary Animal: Evolution and the nature of narrative*. (pp. 259-264). Buffalo, NY: Northwestern University Press.
- Dutton, D. (2009). *The art instinct: Beauty, pleasure, and human evolution*. New York: Bloomsbury Press.
- Evolution 101*. Glossary. (2012). Berkeley University. Retrieved from http://evolution.berkeley.edu/evosite/glossary/glossary_browse.shtml
- Gabriel, P. (1992). *Steam. Us*. UK: Real World Records, Ltd. (CD).
- Gottschall, J. & Wilson, D. S., Eds. (2005). *The literary animal: Evolution and the nature of narrative*. Evanston, IL: Northwestern University Press.
- Gottschall, J. (2012). *The storytelling animal: How stories make us human*. New York: Houghton Mifflin Harcourt.
- Gottschall, J. (2005). Quantitative literary study: A modest manifesto and testing the hypothesis of feminist fairy tale studies. In J. Gottschall & D. S. Wilson (Eds.). *The Literary Animal: Evolution and the nature of narrative*. (pp. 199 224). Buffalo, NY: Northwestern University Press.
- Harpham, G. G. (2010). Afterword. In E. Slingerland & M. Collard (Eds.), *Creating Consilience: Toward a second wave*. Oxford: Oxford University Press.
- Kramnick, J. (2011). Against literary Darwinism. *Critical Inquiry*, Vol. 37, No. 2, 315

347.

- Kruger, D. J., Fisher, M., & Jobling, I. (2005). Proper hero dads and dark hero cads: Alternate mating strategies exemplified in British romantic literature. In J. Gottschall & D. S. Wilson (Eds.). *The Literary Animal: Evolution and the nature of narrative*. (pp. 225-243). Buffalo, NY: Northwestern University Press.
- MacLeish, A. (1962). *Ars poetica*. Retrieved from <http://www.poets.org/viewmedia.php/prmMID/15222>
- McCarthy, C. (2006). *The road*. New York: Vintage International.
- Miller, G. (2000). *The Mating Mind*. New York: Doubleday.
- Olson, R. (2009). *Don't be such a scientist: talking substance in an age of style*. Washington, DC: Island Press.
- Oxford English Dictionary*. (2012). Retrieved from <http://www.oed.com/>
- Ostler, E. (2012). 21st century STEM education: A tactical model for long-range success. *International Journal of Applied Science and Technology*. 2(1),28-33.
- Palmer, B. (2006). Arts essential to multidisciplinary research, teaching. *Stanford Report*. Retrieved from <http://news.stanford.edu/news/2006/april26/arttalk042606.html>
- Pinker, S. (2007). Critical discussion: Toward a consilient study of literature. *Philosophy and Literature*. 31. 161-177.
- Pinker, S. (1997). *How the mind works*. New York: W. W. Norton & Company.
- Pinker, S. (2007). *The language instinct: PS*. New York: Harper Perennial Classics.
- Robelen, E. (2011). STEAM: Experts make case for adding arts to STEM. *Education Week*. Retrieved from http://www.edweek.org/ew/articles/2011/12/01/13steam_ep.h31.html
- Root-Bernstein, R., et al. (2008). Arts foster scientific success: Avocations of Nobel, National Academy, Royal Society, and Sigma Xi members. *Journal of Science and Technology*, 1(2). 51-63. DOI: 10.1891/1939-7054.1.2.51
- Sagan, C. (nd). Retrieved from <http://www.brainyquote.com/quotes/quotes/c/carlsagan164459.html>
- Scalise-Sugiyama, M. (2005). Reverse-engineering narrative: Evidence of special design. In J. Gottschall & D. S. Wilson (Eds.). *The Literary Animal: Evolution and the nature of narrative*. (pp. 177-196). Buffalo, NY: Northwestern University Press.
- Schopf, J. W., ed. *Evolution!: Facts and Fallacies*. (1999). San Diego: Academic Press.
- Vonnegut, K. (1985). *Galapagos*. New York: Dial Press.
- Wade, N. Early voices: The leap to language. *New York Times*: 15 July, 2003.
- Wilson, D. S. (2005). Evolutionary social constructivism. In J. Gottschall & D. S. Wilson (Eds.). *The Literary Animal: Evolution and the nature of narrative*. (pp. 20-37). Buffalo, NY: Northwestern University Press.
- Wilson, E. O. (2005). Foreword from the scientific side. In J. Gottschall & D. S. Wilson (Eds.). *The Literary Animal: Evolution and the nature of narrative*. (pp. vii-xi). Buffalo, NY: Northwestern University Press.

APPENDIX

Key Terms

*FYS: acronym for FYS, an introductory general education course designed to educate incoming undergraduates through academic inquiry into a current field of interdisciplinary study.

*Literary Darwinism: a field of literary criticism wherein scholars explore literature in the context of evolution.

*STEAM: acronym for Science, Technology, Engineering, Arts, Mathematics.

Rubrics

For more information regarding the AAC&U VALUE Rubrics used to design assessment tools for this FYS course, see:

<http://www.aacu.org/value/rubrics/index.cfm>

(*For specific FYS RUBRICS used in this course, please contact the author: awalker@highpoint.edu).

Student example of Assignment 1: *Lost in Translation*

Words of Choice:

a cliché: karma is a bitch

an aphorism: absence makes the heart grow fonder

a euphemism: batting for the other side

a quote of scripture: And keep up prayer in the two parts of the day and in the first hours of the night; surely good deeds take away evil deeds this is a reminder to the mindful. (The Holy Prophet 11.114) Koran

Throughout history, words have transformed the way we see the world. Words are the most powerful tool for creating change, and have forged a new world order. Words help us to explain the inexplicable, they capture the hearts of millions, they incite riots and inject fear into the hearts of men. Words are undoubtedly one of the most powerful tools man has ever wielded. Denis Dutton, one of the foremost 'evolutionary adapted language' thinkers cites language as having three main purposes, these are: "the communicative/descriptive function, the imaginary function and the fitness indicator function" (Art Instinct, Dutton.) Language serves these, and other functions in our daily lives, and has done so since its earliest development in our Pleistocene ancestors. Languages are virtually a skill in our modern world, the more you know the better off you are and the more powerful your words can be. However, no language comes without nuances or idiosyncrasies that make their understanding and translation just that much more difficult. As Steven Pinker points

out, though we may share a common ancestor we do not in fact share a common language. There are thousands on dialects and languages spoken around to world, so it is nearly impossible for any one term to be universal in its meaning, from past to present or across languages. Thus, much is often lost in translation.

The cliché 'karma is a bitch' is composed of two distinctly different words with separate histories and quite different evolutions. The word Karma, for example has its roots in Sanskrit and was an established term long before several of our modern languages were in existence. Thus karma translates easily from one language to another, with almost no confusion. While bitch is used as 'puta' in Spanish or 'cagna' in Italian, its meanings are almost universal. Bitch has been used to describe a female dog, or more crudely the female offspring of an animal since the early 1500's in English, with an earlier transition from Spanish and Italian. This word could easily have been spread throughout the world during the colonial and imperial era, to this end we see it originate fair earlier in languages from known conquering countries such as Spain. When put together however, in the phrase we hear regularly in America 'karma is a bitch', there is quite a bit lost in translation. As the word bitch shifted during the mid 1800's, when women were low in society and thought of as a whore-ish gender, often exploited, it began to take on new meaning. The word bitch then became known as a derogatory word for women. Today, it can also be used as a verb, meaning to constantly whine and complain. Even as I type this my MacBook is trying to correct 'bitch' to gripe, complain or criticize, clearly the contextual clues are vital to interpreting the meaning of the word. As would be observing someone as they say it in order to further determine how they are using the term.

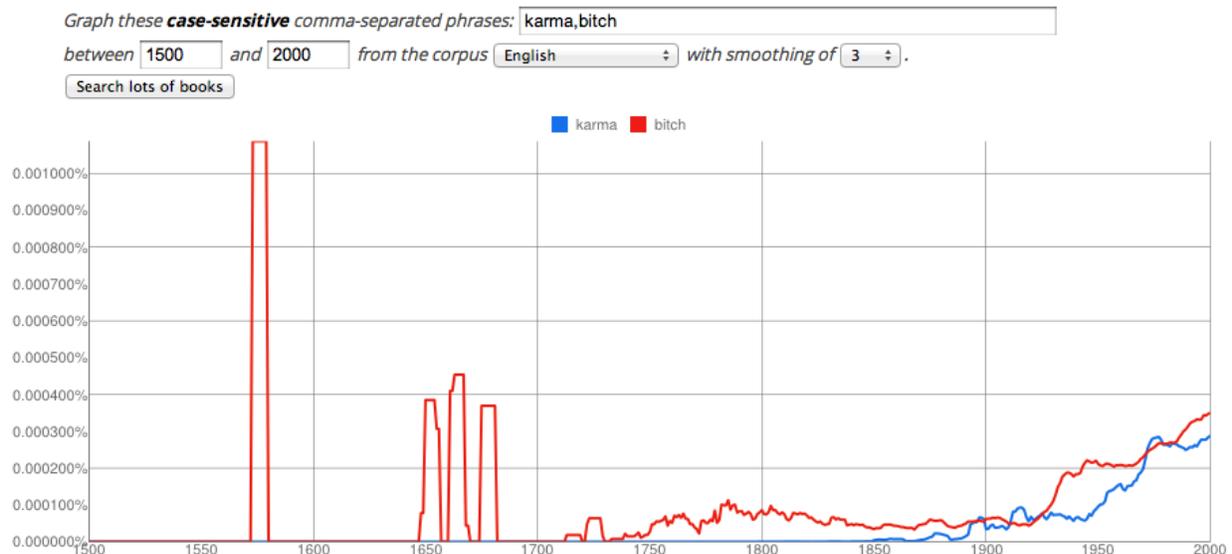
While compiling the history of the phrase 'karma is a bitch' ,I encountered a forum called 'WordReference' in which people post questions about linguistics and phrases. There was must question about what this phrase meant from French and German people, who attempted to compare it to 'you reap what you sow' but lacked any equivalent phrase in their language. While the meaning of each word separately is quite clear, when put together this phrase takes on a new meaning. It uses karma as a subject capable of being a 'bitch,' which becomes an adjective in a different form than usual. Nuances like this make language acquisition all the more difficult. While one may have mastered the phrases karma, and even potentially the several meanings of bitch, the phrase karma is a bitch is not as universal as its parts and could easily cause confusion.

Though the word absence did not appear in the English language until the mid 17th century, the aphorism 'absence makes the heart grow fonder' is essentially an English term. Its use and translatability are limited to the romance languages, from which the words absence and heart both derive their Latin roots. While each word taken on their own has singular meaning, when put together those meanings do not entirely change. Absence out of any of the words is the most versatile. Its roots are from early Christian era Europe (OED, Absence), and though it was originally meant as a deficiency of some sort, one would not often pair them as synonyms today. The two terms are not quite as interchangeable as their early histories would believe them to be. The words themselves contribute equally to the meaning of the aphorism in general, making this one of the easiest phrases to

translate cross culture. This, unlike most of the other phrases I examined uses words as they are usually used, and this makes the translation a rather simple one.

However the other phrases I chose: *batting for the other side*, which is commonly used as a reference to being gay, without actually acknowledging this fact, and a quote from the Muslim scripture, the Koran, are not so easily translated. It seems that both of their meanings are more socially constructed, especially in the case of the *batting for the other side* euphemism. This comes from the idea that women and men are different 'teams' and is an analogy to *batting for another team*, a baseball reference. This is a heavily Americanized term that has only recently begun to pick up in other countries such as England and Spain. Similarly, the Koran is written in Arabic, which is thought to be one of the hardest languages to learn and

Google books Ngram Viewer



translate because of its extreme differences in formatting and structure from most other languages, especially those of the Western world. Not only is learning these languages, like Arabic and Russian, extremely difficult, but translating phrases that exist in them to English and back is almost futile most often.

Languages, like culture and people, adapt and change over time. Just as our linguistic skills adapted from very basic and rudimentary story telling and warning signs of our ancestors. Now language is one of the most beautiful and important aspects of the human race. However, the nuances exist, and the evolution of language along side human evolution makes learning languages even more of a challenge. Words have meaning just as humans have traits, and these meanings shift, alter and change over time. They take on new definitions and they are not always linked across culture. Thus the adaptations of new languages take time, and learning requires advanced skill and often lacks perfection. It seems that the

evolution of language is much like the Darwinian evolution of humans and animals, creating an even more definitive answer for the question of language as an evolutionary adaptation.

cliché (ex. trials and tribulations)

karma is a bitch

in Russian Karma is the baba? a word that doesn't exist in English

Italian is perfect.

an aphorism (ex. the early bird catches the worm)

absence makes the heart grow fonder

in Japanese The Resistance to recruit

in Swedish There is no will to heart is growing fund

a euphemism (ex. pushing up daisies)

batting for the other side

in Czech Launch on the other side

in Korean Another Blow

a quote of scripture (ex. from King James, Torah, Qur'an, etc.)

And keep up prayer in the two parts of the day and in the first hours of the night;

surely good deeds take away evil deeds this is a reminder to the mindful. (The Holy Prophet 11.114) Koran

in French mindful= reflect, in Spanish and French the two parts = both

in German The salad and the two parties of the day and in the first hours of the night, the sure good actions take precedence over wrong actions is a note for those who think.

in Hindi In praying and in two parts of day and night hours before, certainly conscious holy for 257 bad deeds.

in Icelandic And keep up prayer in the two parts of the day and for the first time last night, surely good deeds off evil works this is a reminder to mind.

Works Cited

"Discover the Story of English More than 600,000 Words, over a Thousand Years." Home: Oxford English Dictionary. N.p., n.d. Web. 27 Sept. 2012.

<<http://www.oed.com/view/blue/class/118453>>.

Dutton, Denis. *The Art Instinct: Beauty, Pleasure, & Human Evolution*. New York: Bloomsbury, 2009. Print.

"Google Ngram Viewer." Google Ngram Viewer. N.p., n.d. Web. 25 Sept. 2012.

<<http://books.google.com/ngrams>>.

"Google Translate." Google Translate. N.p., n.d. Web. 23 Sept.

2012. <<http://translate.google.com/>>.

"Language Forums." Karma Is a Bitch. N.p., n.d. Web. 27 Sept. 2012.

<<http://forum.wordreference.com/showthread.php?t=629672>>.

Student example of Assignment 2: *STEAM Shuffle*

What would you call them?

EvoS Journal: The Journal of the Evolutionary Studies Consortium

ISSN: 1944-1932 - <http://evostudies.org/evos-journal/about-the-journal/>

2013, Volume 5(1), pp. 15-50.

Can you think back to a time when you connected a song to a particular memory or experience? If the answer is yes, the cognitivist theory gives a brief explanation. Cognitivist theory believes that the experience or interpretation of a musical sound is a result of a conscious process of inference (Ben Ushedo). This means that music has expressive properties that listeners recognize. Jennifer Robinson agrees by saying, "Music can make me feel tense or relaxed; it can disturb, unsettle me, and startle me; it can calm excite or me down me..." While reading *The Road* by Cormac McCarthy, I immediately turned on my iPod and began to play "Keep Holding On" by Avril Lavigne. At first I did not understand why I had done this but after researching about music, emotion, and experience I quickly realized the reason. Not only did I focus on the emotion of the book and the song, I also focused on the literary Darwinian theme of parental investment. Through these two mediums of art I could directly connect ideas and relate them to the literary Darwinian theme of parental investment. Along with this theme we can further understand the emotion behind both mediums and how it can connect to the ways in which our brain functions.

Have you noticed that we tend to put on a sad song when we are emotionally upset or an upbeat energetic song when we are happy? This is what happened every time I finished reading parts of *The Road*. Not only did the lyrics make me feel sad, the tone and rhythm of the song definitely emphasized this feeling. *The Road* is about a man and a boy living in a post apocalyptic world. The only path they have to take in this journey is the road. Every step of the way is depressing and life threatening. In some parts of the book the little boy says things that most young children would not quite understand. This could be due to the horrific things the boy has seen throughout his entire life. By reading only the first couple of pages you get this sense of sadness. This is the reason why I connected *The Road* to the song Keep Holding On. "Keep Holding On" by Avril Lavigne is a very depressing and sad song. Just like *The Road*, "Keep Holding On" brings an emotional feeling right from the start of the song. In both the book and song there seems to be a continuous feeling of sadness. Although the man tries to establish a sense of hope and faith, deep down inside he knows that the end is coming. This can also be seen in the song I chose. The lyrics say, "Before it's too late, this could all disappear, before the doors close, and it comes to an end." These few lyrics give you an idea of how sad this song is. Through emotion I was able to connect these two mediums of art together. After connecting the emotion I felt from the book and the song, I then took the connection to another level and related the song and book to a Darwinian theme.

Even though several literary Darwinian themes are present in *The Road*, I decided to focus strictly on parental investment. Parental investment is any parental expenditure (time, energy, etc.) that benefits one offspring at a cost to parents' ability to invest in other components of fitness (Clutton-Brock 1991: 9; Trivers 1972). This Darwinian theme can be found throughout the entire book and song. Each example of parental investment from *The Road* can be automatically connected to lyrics from Keep Holding On. Through the entirety of this book we see two important sentences. Both sentences are short and simple, but are extremely important. The first sentence that the man says to the boy is, "We're not going to die." The second

sentence seen throughout *The Road* is again something the man says to the boy, “I won’t leave you.” Within the contexts of what the man and boy are talking about, the man is trying to enforce the idea that there is hope and they are in it together. When looking at the parental investment aspect of it, the man is trying his hardest to make the boy believe he can survive and that he will be protected from whatever bad there is in the world. These sentences were the main reason I chose Keep Holding On. The title of the song explains this idea of hope and survival. In the first few lines it says, “You’re not alone, together we stand, I’ll be by your side, you know I’ll take you hand.” Avril Lavigne is trying to emphasize the importance of believing that you are not alone in this world. Also, throughout the whole song the words, “Keep holding on, ‘Cause you know we’ll make it though, we’ll make it through, Just stay strong, ‘Cause you know I’m here for you, I’m here for you. The book and song are extremely similar in this aspect because the chorus above gets repeated throughout the whole song and in the novel the man comforts the boy and makes him believe they are going to end up okay every step of the way. Another part of parental investment that is valuable for survival is protection. On page 65 he tells the “bad” guy, “If you look at him again I’ll shoot you.” In the end the man shot the “bad” guy because he held a knife up to the boy. Also, on page 77 after the shooting the bad guy the man says to the boy, “My job is to take care of you. I was appointed to do that by God. I will kill anyone who touches you.” When relating this example back to the song we see the lyrics... “With you by my side I will fight and defend.” Through this similarity, protection is the utmost important aspect of this Darwinian theme. Speaking in evolutionary terms, protecting one’s offspring allows genes to survive and be passed on through generations, this is the particular reason protection is so important to species. Along with the protection comes risking one’s own life for their offspring. On page 113, the man and boy run from the house that sheltered the slaves in the basement because they saw the “bad” guys. When hiding in the woods, the man tells the boy, “I was going to run. To try and lead them away.” This action gives you a brief example of how important parental investment truly is to each species. Lastly, on page 101 the boy finally realizes that his father is lying to him about death. The man asks, “But you think I might lie to you about dying.” The boy answers, “Yes.” The reason I chose this particular conversation is because it connects to the Keep Holding On. It also relates to parental investment in that there is a time when the “offspring” must start to grow up and learn the reality of the world or else they will not survive. At the end of the book the boy finally realizes that death is inevitable, and can also be seen at the end of the song. The end lyrics are, “There’s nothing you could say, nothing you could do, there’s no other way when it comes to the truth.” We can look at these lyrics as if the boy is talking to his father and telling him he understands, giving him no reason to lie anymore. Overall, this book and song go hand and hand with each other allowing one to completely understand the concepts of parental investment.

Emotion, as well as every Darwinian theme is apart of our every day life. Doesn’t it make sense that I could easily feel emotion and find Darwinian themes in *The Road* and Keep Holding On? Humans are genetically wired to feel emotion and most often create art in terms of Darwinian themes. Although some completely disagree with Literary Darwinism, one could easily find the Darwinian themes in any

medium of art whether it be a novel, painting, movie, etc. If you actually sit down and think about it, what would life be like if there were no emotions? Would we even be considered humans or just a non-living thing? This question allows you to see how important it is to have emotion and how it must be encoded somewhere in our genes. There is a reason emotion has brought us this far. Along with emotion come the Darwinian themes. We use these themes in art and in our everyday life because we are hard wired to. We cannot control the unconditional love we have for our children and the immense protection we have towards them as seen in *The Road*, we cannot control the fact that we would rather pick a painting that has the environment allowing one to survive as seen in *The Art Instinct*, and we cannot control the competition we have to survive. Just by listing these three Literary Darwinian themes you get the idea that they are somewhere in our genes and we do these things to survive. Maybe these themes should not even be called themes, but instincts. What would you call them?

Works Cited

- "AVRIL LAVIGNE LYRICS - Keep Holding On." *A-Z Lyrics Universe*. A-Z Lyrics, n.d. Web. 27 Sept. 2012. <<http://www.azlyrics.com/lyrics/avrilavigne/>>.
- Clutton-Brock, T.H. 1991. *The Evolution of Parental Care*. Princeton, NJ: Princeton U. Press.
- Trivers, R.L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man, 1871-1971* (pp. 136–179).
- Ushedo, Ben . "Music & Emotion | Issue 57 | Philosophy Now." *Philosophy Now | a magazine of ideas*. Philosophy Now, n.d. Web. 1 Oct. 2012. <<http://philosophynow.org/issues/57/Music>>.

University Demographics: High Point University Class of 2012

http://www2.highpoint.edu/admissions.php?id=2371&active_accordion=0

Applications and Acceptances

Total Applications Received: **8,200**

Acceptance Rate: **61%**

Freshman Enrolled: **1333**

78% of this year's freshmen applied Early Decision or Early Action

Mid-range SAT scores for entering freshmen: **1010-1190**

Mean SAT score (CR & Math) for entering freshmen: **1106**

Mean ACT Composite score for entering freshmen: **24**

80% of the students in this year's class ranked in the top half of their graduating classes.

Average GPA on a 4.0 scale: **3.33 unweighted**

Geographic Breakdown

- Students in the Class of 2015 represent 41 states (including Washington, DC) and 9 countries
- Top 10 states by percent of enrolled freshmen: **(1)** North Carolina **(2)** Maryland **(3)** New Jersey **(4)** Massachusetts **(5)** New York **(6)** Pennsylvania **(7)** Connecticut **(8)** Virginia **(9)** Ohio **(10)** Florida

Ethnic Diversity

African American: **5.8%**
American Indian or Alaskan Native: **5.7%**
Asian or Asian American: **1.5%**
Caucasian: **74%**
Hispanic or Latin American: **2.6%**
Other: **1.4%**
Unknown/Not Reported: **9%**

Top 10 Intended Majors

1. Business Administration
2. Communication
3. Undecided
4. Education
5. Biology
6. Exercise Science
7. Psychology
8. Criminal Justice
9. Interior Design
10. Human Relations

Gender: 44% Male 56% Female

99% of freshmen live on campus. High Point University's on-campus accommodations include 13 residence halls, including 5 apartment and townhouse communities.

Interesting Facts About the Freshmen Class

- There are 40 National Merit Scholars, Valedictorians, Salutatorians and High School Student Government Presidents.
- 416 students in the entering class have Advanced Placement Courses from high school, earning over 2819 credit hours.
- 30 students have earned the distinction of Eagle Scout or Gold Award recipient.

- 40 students have a family member who attended HPU, 7 have a current sibling who is attending HPU and there are 5 sets of twins in the class of 2016.
- There are 14 languages spoken fluently among the class.

Received 5/30/12; Resubmission 1 10/27/12; Resubmission 2 12/19/12; Accepted 1/4/13