December 2014

The Hilltop Review, vol 7, no 1, Winter 2014

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Notes from the Editor

I am pleased to present the winter 2014 issue of The Hilltop Review—my first as editor. For those of you who have not met me, allow me to introduce myself. My name is Rebecca Straple, and I was approved as editor of The Hilltop Review by the members of the Graduate Student Association in a General Meeting in May 2014. I’m a PhD student in the Department of English, and my research focuses on gender, the body, and sexuality in early medieval literature, particularly that of the Anglo-Saxons and Scandinavians. I have a BA in Publishing Studies and Dance Performance from Illinois State University, an MA in Medieval English Literatures from the University of York, and have experience in a variety of publishing environments. I am excited to present my first issue of The Hilltop, and look forward to continuing to work on the journal for the next three issues, giving graduate students the chance to publish their research, art work, and creative writing and to experience the review and publication process. Please feel free to contact me at gsa_hilltop@wmich.edu if you have any questions for me or if you would like more information about how to get involved with the journal.

We also have several new members of the editorial board: Roland Black, of the Medieval Institute; Cameron Manche and Hannah Pankratz, of the Department of Geosciences; Caroline Ray, of Integrative Holistic Health and Wellness; and Dani Ryskamp, of the Department of English. Joshua Berkenpas, a former editor of the journal and member of the editorial board, also continues his service to graduate research as a member of the board. My sincere thanks go out to all of them—each member of the editorial board reviewed two articles for this issue, and they also read each submission marked for publication and determined the winners of the Paper, Artwork, and Creative Writing awards for this issue.

Thanks also to the Executive Board of the Graduate Student Association, which has been rebranded this year from the Graduate Student Advisory Committee. Damon Chambers continues as President (formerly Chair) and Marcial Amaury Pineda takes over the role of Vice-President (a position formerly known as Vice-Chair). The E-Board of the GSA has worked tirelessly over the past two years to rebrand the GSA, spread awareness of the organization and the work they do, and restructure the organization to spread the duties of the E-Board over a greater number of positions and to create the Graduate Ambassadors program. I encourage all of you to attend General Meetings, as we are all automatically members of the GSA and the GSA is, as Mr. Chambers likes to say, “your voice on campus.” The members of the GSA, in fact, helped to break a tie between our two pieces of artwork in this issue that resulted from our editorial board’s votes, and chose “Autumn on the Kal-Haven Trail” as the winner of the Artwork Prize and the cover image of this issue. This is just one small example of the ways in which your voice matters as part of the GSA.

Finally, the biggest thanks of all goes out to the graduate students who submitted their work to The Hilltop Review, and to the graduate students and faculty members who served as peer and faculty reviewers for each piece submitted. The double blind reviewing process is a vital step in the publication process, and I greatly appreciate the effort and time of each of our reviewers. If you are interested in reviewing for The Hilltop, please contact me! The review process usually takes only 1-3 hours and it’s a great line on your CV.

Congratulations are in order for the winners of our various Prizes! Paper Prizes: First Place to Mark S. Barajas for “Thinking and Feeling: The Influence of Positive Emotion on Human Cognition,” for which he will receive $500; Second Place to Yi-chin Huang for “The Rhetoric about Exile in the Preaching and Teaching of the Anglo-Saxon Church: Glimpses of Cultural Ideology Revealed in the Homilies,” for which she will receive $300, and Dani Alexis Ryskamp for “Neurodiversity’s Lingua Franca?: The Wild Iris, Autobiography of Red, and the Breakdown of Cognitive Barriers Through Poetic Language,” for which she will receive $150. Artwork Prize and Cover Image: Charles Lein for “Autumn on the Kal-Haven Trail,” for which he will receive $250. Creative Writing Prize: Luke Chambers for “The Four
Seasons,” for which he will also receive $250. Congratulations to our winners! (All reviews and judging are double-blind; I do not take part in the judging process, and Dani Ryskamp did not consider her own paper in her judging.)

In this issue we have ten articles, two pieces of artwork, and four creative works that represent the best research, thinking, and creativity of Western Michigan University graduate students. This issue features articles from Counseling Education and Counseling Psychology, English, Philosophy, Sociology, Educational Leadership, Research and Technology, Computer Science, Chemical Engineering, and Engineering. Creative and art works have also been received from a wide variety of departments, including the Medieval Institute, Geosciences, Communication, Evaluation, and Anthropology.

The editorial board and I look forward to receiving and publishing more articles, art work, and creative writing by WMU graduate students. The Call for Papers for the spring issue can be found at the end of this issue or online at wmich.edu/gsa/hilltopreview. This is also the first issue of The Hilltop that was not only hosted by ScholarWorks, but for which submission, review, publication, etc., were entirely managed through ScholarWorks. We plan to continue using this resource in the future, and the process is explained in submission guidelines, available on the website and on The Hilltop Review’s homepage on ScholarWorks: http://scholarworks.wmich.edu/hilltopreview/policies.html.

The winter 2014 issue of The Hilltop Review did not have a theme; the next issue, spring 2015, will be organized around the theme of “Changes in Culture and Technology.” We believe that this theme will be an interesting way to focus the content of the journal in the next issue while remaining broad enough that students from all departments and schools could potentially submit articles that fit it (and thanks to editorial board member Cameron Manche for the suggestion!). Whether you are interested in cultural changes in modern or ancient times, changes to technology, or changes in culture brought on by changes and advancements in technology, I encourage you to submit for spring 2015. The editorial board and I look forward to reading your interpretations of next issue’s theme.

I hope you enjoy this issue, and look forward to working with you all for the next three.

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Thinking and Feeling: The Influence of Positive Emotion on Human Cognition

First Place Paper, Winter 2014

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Since at least the time of the ancient Greeks, humans have wondered about the nature of emotions and the role they play in human life. Philosophers such as Socrates, Plato, Descartes, and Kant have considered the relationship between thinking and feeling in everyday human experience and have tried to better explain how emotional and rational processes influence behavior. Some thinkers have argued that emotion, or affect, clouds human thinking and is a liability to rational, logical thought, while others have suggested that affect is an essential and adaptive component to cognition which broadens and expands rational thought (Forgas, 2008). Modern technological advances have afforded researchers from disciplines such as medicine, psychology, and physiology investigative opportunities to observe the interplay of affect and cognition in ways the ancient Greeks may have never imagined. With increased technology and more sophisticated research designs, scholars have come closer to understanding the neural correlates of affect and the ways in which different affective states influence cognition.

While there exists a broad collection of research regarding affective states, researchers have tended to focus on so-called “negative” emotions (Forgas, 2008). Consequently, relatively little research is focused on positive affect in general and even fewer researchers investigate how positive emotions may influence the therapeutic change process. Positive emotions, however, are important for clinicians to consider because of their generative and catalytic influences upon the therapeutic change process. Thus, this paper is an attempt to summarize and integrate research from cognitive, neuro, and clinical psychology such that clinicians and will have a better understanding of the role of positive emotions in the therapeutic change process. First, a brief historical overview of the consideration of affect will be presented, followed by a summary of theoretical approaches to understanding the affect – cognition relationship. Next, a theory explaining positive affect’s influence on cognition will be described and three experimental studies investigating affect, cognition, and the role of dopamine will be reviewed. Finally, practical applications of research regarding positive affective states will be discussed and suggestions for future lines of inquiry will be presented.

Theoretical Background

Historical Perspective

The emphasis and focus of psychology has changed throughout the years. During the 18th century, philosophers began to conceptualize the subject matter of psychology as concerned with three separate domains: cognition, affect, and conation (Forgas, 2008). As psychology slowly evolved, each of the domains was given attention depending on the interest of the scholar and the predominant Zeitgeist. During the formal founding of psychology in the late 19th century, researchers such as Wundt and Titchener viewed the three domains as
“inseparable, complementary aspects of human experience” (Forgas, 2008, p. 94). Although introspective experimental methods were part of the formal founding of psychology, some thinkers did not agree with the mentalist approach and instead argued that psychology should focus on observable, measurable behavior.

In the early to mid 20th century, behaviorism became the dominant force in US psychology as researchers sought to better understand behavior through precise measurements and tightly controlled experiments. Although the goal of early 20th century US behaviorism was prediction and control of behavior, there were other, more mentalist schools of thought emerging in Europe, notably Gestalt psychology. Psychologists of the mid to late 20th century began giving more attention to affective states and technological advances since the 1980’s have allowed researchers to view the brains of people actively experiencing emotions. It could be argued that psychology has come full circle and again views cognition, affect, and conation as connected parts of human existence.

Modern Theoretical Approaches

There are several modern approaches to understanding the relationship between affect and cognition. Appraisal theories “seek to explain the cognitive genesis of emotions…and the functions they serve” (Forgas, 2008, p. 96). Classic examples of appraisal theories are the James-Lange and Cannon-Bard theories of emotional arousal. These types of theories search for physiological correlates of affective states and try to incorporate an individual’s interpretation of bodily sensations when describing the subjective experience of an emotion. Another class of affect-cognition theories, known as infusion models, tries to understand how emotional states influence thinking. Some infusion theorists focus on the influence of emotional states on decision making and judgment processes, while others focus on how emotions influence information processing and the content which is stored in memory. Finally, integrative theories of affect-cognition explore how emotions influence both content and process of cognition (Forgas, 2008).

Conceptual theory of positive affect. Since about the 1980’s, many researchers have documented the influence of mild positive emotional states on a wide range of human behavior and cognitive processes (Isen, 1999). Studies have shown that subtle positive feelings elicited by simple events such as seeing a few minutes of a comedy film, receiving a small gift, or unexpectedly finding a small amount of money are enough to produce significant changes in thinking and behavior. Positive affect has been associated with greater efficiency with both fundamental and complex cognitive processes. Researchers have shown that memory and learning are enhanced when subjects are in a positive state as compared to a neutral or negative affective state. Creativity, problem solving, and risk-assessment have also been shown to be influenced by positive affective states as compared to neutral or negative affective states (Isen, 1999). In addition to cognitive tasks, subjects experiencing positive affective states have been shown to have greater motivation to exercise and engage in more pro-social behavior such as altruism and donating time or money to charity as compared to subjects experiencing neutral or negative affective states (Isen, 1999).

Within conceptual research frameworks, scholars have theorized that positive affective states give individuals access to a wider array of mental faculties that result in more efficient problem solving strategies (Isen, 1999). This idea has come to be known as the broaden-and-build theory (Fredrickson, 2001). Proponents of this theory argue that healthy individuals most often exist in a neutral or mildly positive affective state and therefore most cognitive encoding occurs during emotional states which are not negative. They theorize that when individuals must access their cognitive store, such access is most efficiently facilitated during mildly positive emotional states. When one is feeling happy, for instance, one has full access
to all mental faculties and is able to make broad connections between cognitive material which may have been stored at different times via different methods (Isen, 2000).

Research into the consequences of positive affective states on human cognition and behavior is not without criticism. Some scholars question the reliability and validity of this type of research while others criticize the correlational nature of some of the evidence indicating positive affective states influence behavior and cognition. Still other critics question how emotions can be sufficiently operationalized and whether the study of human emotions is scientifically possible. In some ways, the debate is the same that has gone on since ancient times. (Ciarrochi, Forgas, & Mayer, 2006)

Scholars investigating the influence of positive affect on human behavior and cognition use a variety of methods to enhance the validity and reliability of their research. To ensure that a desired affective state was indeed induced, researchers may use manipulation checks or triangulation methods to verify a certain feeling was experienced (Isen, 1999). Manipulation checks are usually embedded within self-report measures and are generally less desirable than triangulation methods. Regarding triangulation, investigators vary the method of affect induction and employ different measures of capturing the consequence of the induced affective states (Fredrickson, 2001). Although every individual study is open to methodological criticism, when taken as a whole, multiple studies have had similar impacts on variables such as creative thinking or problem solving, such that “the most parsimonious interpretation for their impact on the dependent measure is in terms of the one quality or factor they share, induction of happy feelings” (Isen, 1999, p. 523). Furthermore, as brain imaging, pharmacological, and genetic technologies have increased, conceptual findings are being validated by physiological measures.

Neuropsychological theory of positive affect. Although neuroscientists have historically given little attention to the idea of positive affect, there are numerous studies of topics closely associated with positive affect – most notably investigation of the neurobiology of reward (Ashby, Isen, & Turken, 1999). Psychologists seeking to understand the effects of positive emotions on human cognition and behavior frequently induce positive feelings by giving a small, unexpected reward to research participants prior to engaging some sort of task. Within neuroscience, rewards have been linked with the neurotransmitter dopamine. Researchers have shown that rewards, and even mere anticipation of rewards, spur the release of dopamine from the brain (Robbins & Everitt, 1996). It has also been shown that dopamine antagonists inhibit reward signals and reduce the effectiveness of reinforcement. Thus, this neuropsychological theory of the effects of positive affect on cognition revolves around the central role of dopamine levels in the brain. More specifically, the theory gives importance to two brain dopamine systems: the nigrostriatal system in the substantia nigra pars compacta and the mesocorticolimbic system in the ventral tegmental area (VTA; Ashby et al., 1999).

There is substantial evidence that dopamine pathways in the VTA are active during the experience of positive affect in humans and that dopamine in the nigrostriatal system is related to motor activity (Ashby et al., 1999). It has been established that dopamine is released from the VTA after presentation of rewarding stimuli, and rewards are closely associated with positive emotions in humans. Researchers have also shown that drugs which mimic the effects of dopamine (e.g., morphine) or enhance dopaminergic activity (e.g., amphetamines) are associated with elevated affective states in humans. Furthermore, dopamine antagonists may result in flattened affect (Wise, 1982). Regarding the nigrostriatal system, dopamine release is associated with motor activity and damage to the system, such as that which typically occurs in Parkinson’s disease, tends to decrease motor activity (Ashby et al., 1999). Although empirical investigations linking positive affect to increased motor activity are few, colloquial expressions such as “jumping for joy” seem to hint at such a relationship. As explained by Ashby et al., (1999) “the dopaminergic theory of positive affect argues that increased motor activity occurs with positive affect because the events
precipitating the elevation in mood lead to stimulation of the VTA, which in turn stimulates the substantia nigra” (p. 534).

In support of their theory, Ashby et al. (1999) point to several physiological processes whereby VTA dopamine influences both affect and cognition. First, the VTA’s direct relationship with the brain’s primary olfactory areas is identified by citing studies showing odors eliciting affective responses and increasing helping behaviors. Next, the well documented relationship between the VTA and the amygdala and the recall advantage for emotionally-laden material compared to neutral material is highlighted. Finally, Ashby et al. (1999) note the dopamine projection from the VTA into the anterior cingulate and cite its involvement with cognitive flexibility. Specifically, individuals who had genetic abnormalities of the anterior cingulate performed better on measures of creative problem solving after receiving injections of dopamine agonists (Ashby et al., 1999). These and other physiological processes provide evidence for the influence of dopamine on human affect and cognition.

Positive affect and therapeutic change. Recently, psychotherapists have proposed a theory of positive affect as generator of therapeutic change (Fitzpatrick & Stalikas, 2008). The theorists acknowledge that although positive emotions have long been conceptualized as indicators of therapeutic change, the view needs to be expanded to consider their generative role. Fitzpatrick and Stalikas (2008b) use Fredrickson’s (2001) broaden-and-build theory as the framework for their idea of positive affect as change agent. According to Fredrickson and Branigan (2005), positive emotions have been shown to broaden one’s scope of attention and facilitate cognitive flexibility. Within psychotherapy, the idea of broadening can be understood as a client’s ability to contemplate new ideas, reinterpret personal situations, initiate new behaviors, or develop alternate solutions to problems. As clients broaden their thinking patterns and explore new solutions, they will build lasting intellectual, physical, social, and psychological resources – thus demonstrating the build component of the theory (Fitzpatrick & Stalikas, 2008).

The theory of positive affect as generator of therapeutic change identifies broadening as a common factor of all successful psychotherapies. “Broadening – whether it refers to broadened schemata, broadened meanings, broadened repertoire of behavioral responses, broadened insight in relationships, or broadened experiencing – is an integral part of all intrapersonal psychotherapies” (Fitzpatrick & Stalikas, 2008, p. 143). The common factors approach to understanding psychotherapy seeks to identify core components of successful treatments in order to develop more efficient training and practice repertoires. Broadening can alter thoughts, feelings, and behaviors and thus unifies all treatment modalities and potential foci of psychotherapy.

Fitzpatrick and Stalikas (2008) argue that the idea of positive affect as change agents is combatable with all theoretical orientations to psychotherapy. Within behavioral traditions, clients are encouraged to broaden their response patterns to distressing situations and then build new behavioral repertoires based on the feedback received from experimenting with new behaviors. Psychodynamic perspectives cultivate client insight of early-life dynamics and facilitate a broad transference relationship with the clinician. Change begins when insight is realized and the client is able to build new understandings and relational patterns. Humanist psychotherapeutic traditions emphasize the role of the client-therapist relationship and recognize that relationship as a vehicle for deepening the client’s experience of life. After broadening the client’s experience within therapy, the client is supported as he goes out into the world and builds upon the successes experienced in therapy. Thus, regardless of the modern psychological tradition one follows (e.g., behavioral, psychodynamic, humanistic) psychotherapy within that tradition seems to center around broadening client experience and building upon new understandings.
Empirical Investigations

Broaden-and-Build Theory of Positive Affect

Fredrickson and Branigan (2005) conducted two experiments to test the central hypothesis of the broaden-and-build theory: whether positive emotions broaden the scope of attention, cognition, and action and widen the range of percepts, thoughts, and actions in the mind. To complete their investigation, 104 university students who were taking an introductory psychology course at a large Midwestern US university were recruited and received course credit in exchange for participation. Of the participants, 66% were women, 22% were members of an ethnic minority group, and all grew up in the United States. Participants used Emotion Report Forms to indicate the amount they experienced the following emotions: amusement, anger, anxiety, contentment, disgust, fear, happiness, sadness, and serenity. Ratings were made on a 9-point Likert scale where 0 corresponded to none and 8 corresponded to a great deal. Participants also viewed a short video clip intended to elicit an emotional response. The video clip was the independent variable and varied between five conditions: penguins, primarily eliciting feelings of amusement; nature, primarily eliciting feelings of contentment or serenity; witness, primarily eliciting feelings of anger or disgust; cliffhanger, primarily eliciting feelings of anxiety or fear; and sticks, an abstract video intended to evoke virtually no emotion.

Each student participated in two experimental trials where they were randomly assigned to watch a video clip and then complete a measure of the dependent variable. For trial 1, breadth of attention was assessed using an 8-item global versus local visual processing task in which participants were presented with a stimulus triad containing a standard figure and two comparison figures. Choosing the comparison figure which corresponded to the standard figure’s whole geometric shape is understood as evidence of global processing, while selecting the comparison figure, which is made up of shapes used in the standard but different from the standard’s overall geometric configuration, is understood as evidence of local processing (Fredrickson & Branigan, 2005). The total number of each type of processing strategy was recorded for each participant. For trial 2, participants were randomly assigned to watch a video other than the one they watched for trial 1. Breadth of momentary thought-action repertoires was assessed using an open-ended Twenty Statements Test. For this task, participants were asked to describe in a few words the strongest emotion they experienced while watching the video and then asked to:

...take a moment to imagine being in a situation yourself in which this particular emotion would arise (the one you wrote on the previous page). Concentrate on all the emotion you would feel and live it as vividly and as deeply as possible. Given this feeling, please list all the things you would like to do right now. (Fredrickson & Branigan, 2005, p. 320)

The instructions were followed by 20 blank lines that began with, “I would like to______.” The total number of statements completed was recorded with more statements indicating a larger thought-action repertoire.

Using qualitative and quantitative methods of data analysis, Fredrickson and Branigan (2005) found their hypothesis supported. Exploratory content analysis and triangulation methods were used to explore participants’ written responses while ANOVAs and two-tailed t-tests were used to analyze numerical data. Regarding trial 1, participants who viewed the video penguins or nature engaged in more global processing compared to participants who viewed sticks, witness, or cliffhanger (p = 0.042). Regarding trial 2, participants who viewed the videos intended to induce positive emotions produced larger thought-action repertoires compared to participants who viewed the videos intended to elicit neutral or negative.
emotions ($p = 0.003$). With these results, Fredrickson and Branigan concluded that individuals experiencing positive emotions exhibit broader scopes of attention and have more numerous thought-action urges than people experiencing neutral or negative emotions. Implications of this study will be discussed in the conclusion of this paper.

**Dopaminergic Theory of Positive Affect**

**Evidence for the role of dopamine in the control of task-switching.** Colzato, Waszak, Nieuwenhuis, Posthuma, and Hommel (2010) recently tested the hypothesis that more efficient use of dopamine is related to greater levels of cognitive flexibility. In this study, 100 university students from the Leiden and Rotterdam metropolitan areas of Amsterdam were recruited and received partial course credit or a small financial reward in return for their participation. Various exclusionary criteria were employed to ensure all of the participants were healthy with the final sample consisting of 53 females and 47 males. Participants’ IQs were determined by means of the Raven Standard Progressive Matrices test and their genomic DNA was extracted from saliva samples. The dependent variable for this experiment was participants’ scores on a computer aided task-switching procedure and the independent variable was participants’ genotype for the enzyme catechol-O-methyltransferase.

Colzato et al. (2010) were interested in the correlation between participants’ genotype of the enzyme catechol-O-methyltransferase (COMT) and cognitive flexibility. COMT has previously been shown to be responsible for the degradation of dopamine and a single nucleotide polymorphism has been shown to influence the activity of the enzyme at body temperature (Colzato et al., 2010). Specifically, the substitution of methionine for valine results in less efficient use of dopamine. Participants’ DNA samples were amplified using standard PCR techniques and yielded a distribution congruent with Hardy-Weinberg equilibrium (i.e., 45.6% Val/Val, 43.4% Met/Val, and 11.0% Met/Met). For statistical analysis, the homozygous Met individuals were combined with the heterozygous individuals.

Participants’ cognitive flexibility was assessed via a computer aided task-switching procedure. Each subject participated in two sets of the task where they completed 15 blocks each with 16 trials. Individual trials consisted of pairs of characters which rotated through each of the four standard 2-dimensional quadrants. Pairs of characters were made up of random combinations of one letter, number, or neutral character (e.g., G3, U%, 8A, $K$) with the position of each character randomly assigned for each trial. When the pairs were in the top quadrants, participants were to give attention to the letter; when the pairs were in the bottom quadrants, participants were to give attention to the digit. The character pairs were presented for either 150 milliseconds or 1200 milliseconds with the time remaining constant during each set of the task. Participants responded to the task by using their left index finger to indicate *even or consonant* and with their right index finger to indicate *odd or vowel* (Colzato et al., 2010).

Repeated-measures ANOVAs were used to analyze the data and yielded partial support for the researchers’ hypothesis. Specifically, there was a statistically significant difference between Val/Val individuals and Met/- individuals for the short presentation time ($p = 0.012$) but not for the long presentation time ($p = 0.432$). The researchers concluded that Val/Val individuals, who have been shown to use dopamine more efficiently, also exhibit greater cognitive flexibility when under time pressure (Colzato et al., 2010). Implications of this study will be discussed in the conclusion of this paper.

**Cognitive flexibility depends on dopamine receptor signaling.** van Holstein et al. (2011) recently tested the hypothesis that the dopamine receptor agonist bromocriptine would improve performance on set switching in individuals with low levels of baseline dopamine. For their study, 48 subjects (24 females) were selected to participate after being recruited via
university advertisements. The participants were all European Caucasians, spoke Dutch fluently, and were financially compensated for their participation. Participants’ verbal IQ was assessed with the Dutch Adult Reading Test, and each participant completed the Beck Depression Inventory, Barratt Impulsiveness Scale, and the State-Trait Anxiety Inventory. In addition to the aforementioned measures, participants’ genomic DNA was extracted from saliva samples. The dependent variable for this experiment was participants’ scores on a computer aided pre-cued task-set switching task.

van Holstein et al. (2011) were interested in how strongly participants’ genotype of the dopamine transporter (DAT) gene predicted baseline dopamine levels. Researchers have previously documented differences in baseline dopamine associated with a common polymorphism in a certain region of the DAT gene (van Holstein et al., 2011). Specifically, researchers identified a 10-repeat (10R) allele and a 9-repeat (9R) allele, with the 10R being associated with more efficient use of dopamine and lower levels of residual dopamine (van Holstein et al., 2011). Participants’ DNA samples were amplified using standard PCR techniques and revealed 27 homozygous 10R individuals, 7 homozygous 9R individuals, and 14 heterozygous individuals. For statistical analysis, the homozygous 9R individuals were combined with the heterozygous individuals.

Participants’ cognitive flexibility was assessed via a computer aided pre-cued task-set switching procedure. Each participant engaged in at least two sets of 160 trials with a 30 second break after every 32 trials. Each set took approximately 30 minutes and were separated by one week. Individual trials required participants to respond to incongruent arrow-word combinations either by responding to the direction indicated by the word (i.e., left or right) or by the direction of the arrow. The task can be compared to the more familiar Stroop Test. Before presentation of each trial, a cue appeared indicating to which stimulus, arrow or word, the participant was to respond. In addition to cuing whether to respond to the arrow or the word, reward anticipation was manipulated by presenting high and low reward cues. For the high reward condition, participants were informed they would receive 10 cents for a correct response and for the low reward condition participants were informed they would receive 1 cent for a correct response (van Holstein et al., 2011).

Supplementing the aforementioned experimental design was pharmacological manipulation. All participants were tested after taking an oral dose of the dopamine receptor agonist bromocriptine and again after taking a placebo. In addition, 14 participants received placebo or bromocriptine after pretreatment with placebo or the dopamine D2 receptor antagonist sulpiride on two testing trials. The order of administration of pharmaceuticals was randomized according to a double-blind protocol and participants engaged in the computer task approximately 4 hours after dosage to ensure optimal drug activity (van Holstein et al., 2011).

Repeated measures ANOVAs yielded strong support for the researchers’ hypothesis. Specifically, bromocriptine significantly improved the performance of individuals genetically determined to have low levels of dopamine ($p = 0.028$) but did not improve performance in individuals with high levels of dopamine ($p > 0.1$). Furthermore, analysis revealed that pretreatment with sulpiride abolished the beneficial effects of bromocriptine relative to placebo ($p = 0.034$). The authors concluded that fast, flexible switching between task-relevant representations is associated with optimal functioning of dopamine D2 receptors (van Holstein et al., 2011). Implications of this study will be discussed in the conclusion of this paper.

Empirical Summary
The three studies presented provide evidence supporting the broad-and-build theory of positive affect and the dopaminergic theory of positive affect. Fredrickson and Branigan (2005) demonstrated that positive affect is associated with broader scope of attention and more numerous thought-action repertoires compared to individuals experiencing flat or negative affect. Colzato et al., (2010) and van Holstein et al., (2011) demonstrated dopamine’s role in cognitive flexibility and showed that individuals who use dopamine more efficiently exhibit greater cognitive flexibility compared to individuals who use dopamine less efficiently. Taken together, these three studies provide strong support for the general theory that dopamine mediates the influence of positive affect on human cognitive abilities and that positive affect expands and enhances human cognitive abilities.

**Practical Applications and Implications**

There are many practical applications and implications of this research for psychology and beyond. It has previously been shown that people experiencing and expressing positive emotions cope more effectively with chronic stress (Fredrickson & Branigan, 2005). Taken with the current study, we may understand that positive emotions facilitate a broad-minded coping style which may function by increasing one’s ability to consider multiple angles or approaches to solve a problem. Teaching people in high-stress environments the skill of positive reappraisal, that is infusing ordinary events with positive meaning, may help them better cope with daily demands. Positive emotions may beget other positive emotions such that over time “people become better able to cope and experience appreciable increases in their well-being” (Fredrickson & Branigan, 2005, p. 328). For educators, being mindful of creating and maintaining a warm, positive classroom environment may enhance students’ ability to creatively problem solve. Business leaders desiring innovation may also benefit from their employees regularly experiencing positive emotions in the workplace. Considering neurological implications, it is possible that inducing positive affect could temporarily reduce symptoms of pathological conditions associated with reductions in dopamine levels. The medical community may also want to take into consideration the cognitive costs associated with dopamine antagonists and prescribe other courses of treatment. Finally, medical researchers and pharmaceutical chemists may wish to give greater consideration to genetic variation in dopamine levels when designing and prescribing drug therapies.

**Future Directions**

There are many possible directions for researchers interested in examining the mediating role of dopamine in the relationship between positive affect and cognitive flexibility. First, researchers might consider exploring the consequences of behavior associated with positive affect. Evidence showing people experiencing positive feelings more frequently engage in acts of altruism compared to individuals experiencing negative or neutral feeling has been based on quasi-experimental designs (Isen, 1999), thus, more rigorous designs using random assignment would help validate such a claim. It is also accepted that variable reinforcement schedules produce the strongest evidence of learning (Ashby et al., 1999). Expanding this line of inquiry into the domain of inducing positive affect could help understand whether there is a difference in positive emotions when one receives an expected gift compared with receiving an unexpected gift. Regarding neuroscience, a more precise understanding of the role and chemical pathways of dopamine could help produce more effective and efficient pharmaceutical treatments. The connection between olfaction and affect could also be further explored. Understanding how dopamine affects the neurobiology of the olfactory system and how scents could induce positive affect may spark innovation into creative methods of
delivering pharmaceutical interventions via the nose. Finally, better understanding the cognitive processes that underlie the broaden-and-build theory (Fredrickson & Branigan, 2005) would add substance to the theory and make it more robust. Investigating whether positive affect also enhances visual acuity, working memory, or tactile dexterity could lead to specifically designed sensory interventions. Understanding how positive emotions influence cognition, and the role that dopamine plays in the process, is an important and broad line of research which could influence several disciplines and enhance the lives of many.

Conclusion

This paper has been a review of the intersection of affect and human cognition with a focus on dopamine as a mediator of the effects of positive affect. Two theories were summarized and three empirical studies were discussed. In addition, practical applications of the research and directions for future inquiry have been suggested. The present topic holds great significance for the general population in that it casts doubt on ideas of genetic endowment and emphasis on childhood experiences as determinants of behavior and ability. Rather, it highlights the dynamic nature of human existence and the idea that people respond to their surroundings and that small positive events can facilitate changes in cognition and behavior. After reviewing the evidence, one may consider whether the key to creative problem solving, prosocial behavior, and ultimate human flourishing lies in the experience and expression of positive emotions.

References


The Rhetoric about Exile in the Preaching and Teaching of the Anglo-Saxon Church: Glimpses of Cultural Ideology Revealed in the Homilies

Second Place Paper, Winter 2014

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Resulting from Adam and Eve’s disobedience against God and their consequent punishment of being cast out of paradise, every human being lives a transitory life of exile in the earthly world, longing to return to the true home in heaven. This is not only one of the most significant theological ideas of Christianity, it also recurs in the extant Old English corpus as an essential part of the Anglo-Saxons’ worldview as revealed in their writings. Words denoting such similar ideas as exile, banishment, driving out, and even journey and pilgrimage can be found throughout the vernacular homilies, i.e., texts designed for preaching and teaching the Christian faith. These texts include the anonymous Blickling homilies and Vercelli Book homilies, and the homiletic works by Ælfric and Wulfstan, who were about a generation later than the production of the Blickling and Vercelli homilies, whose sermon collections are recognized as the peak of Anglo-Saxon vernacular prose writing. In the homiletic literature, the theme and imagery of exile are used not only to describe the Fall of Adam and Eve but also to deliver the homilists’ moral exhortations by alluding to the Fall. Such theme and imagery recur so significantly in a variety of contexts in the Old English homiletic literature that they arouse curiosity: How can we understand the rhetoric about exile and its related concepts in the discourse of preaching and teaching? In what ways do the vernacular homilies strategically employ a language about banishment, which is also a theme whose significance is also articulated in Old English poetry?

In my study, I adopt a contemporary approach of rhetoric analysis to explore the rhetoric of exile in the Old English texts of preaching. This rhetorical approach does not necessarily refer to classical definitions of oratory techniques from the Latin tradition; rather, I attempt to examine the exile motif by focusing on their texts and contexts as well as the relevant features, like figurative language, recurring images, and connected themes, including the transitoriness and mutability of the earthly life, the moral exhortation of doing good deeds and rejecting evil, and, the need of repentance for the soul’s salvation. Although the theme of exile and its related topics in Old English poetry have already been explored in the existing scholarship of Anglo-Saxon literature and some studies among them already connected this theme to the teachings in homilies, so far there has not been much scholarship with a specific focus on the persistent rhetoric of exile used in the vernacular prose homilies. In view of how the theme and imagery of exile feature in both poems and homiletic prose, and how the phenomenon of exile recurred significantly in the society of Anglo-Saxon England (as we find their in historical records), the Old English homiletic rhetoric of exile that aims to teach Christian doctrines indeed seems to be worthy of further exploration in terms of its performative and persuasive power.

As to the vernacular prose texts of Old English homiletic literature, first of all, there is a terminological issue that needs to be clarified. According to the traditional definitions of preaching texts, a homily is an exegetical text in which the preacher interprets specific scriptural passages and which is usually connected to a liturgy in Roman Catholic tradition. A
sermon, on the other hand, refers to a catechetical or hortatory discourse in which the preacher gives doctrinal instructions and moral exhortation in order to teach the congregation to right behavior. In the extant Anglo-Saxon prose preaching texts, however, there is no clear distinction between the two types, and thus in current Old English studies these texts are usually referred to as homilies.\textsuperscript{ii}

Among the four surviving collections of Old English homilies, the \textit{Blickling} manuscript and the \textit{Vercelli} book contain anonymous homilies with uncertain dates of writing and compilation. These two collections are considered to be written in around mid- or latter-tenth century, about a generation earlier than Ælfric and Wulfstan, a chronological difference that leads to differences in contents. For example, the \textit{Blickling} and \textit{Vercelli} collections show less concern about the patristic sources treat their theological themes in a more fantastic way than Ælfric and Wulfstan, whereas the latter two authors emphasized the use of canonical sources and consistent teachings.\textsuperscript{iii} Regardless of such differences, the four homiletic collections all seem to be aimed at lay congregations as their primary audience.\textsuperscript{iv} Such targeted audience as the laity—as one of the homilists’ primary concerns about their oral elucidation and delivery—may also have essential influences on the how rhetoric is used in preaching.

In the belief system of the Christian faith, human history begins with the fall of Adam and Eve. How the fall consequently makes all mankind live in this world like exiles live in a foreign land is a predominant metaphor in discourses of preaching, including those by the earliest church fathers and by the tenth-century homilists who inherited this tradition. In Homily II of the \textit{Blickling} collection, for instance, this metaphor is used in a dramatic description with the imagery of blindness:

\begin{quote}
\text{Eal þis mennisc ce wyn wæs on blindnesse, seoððan þa ærestan men asceofene waren of gæfan neorxna wanges, \& þa beorhtness forleton þæs heofonlican leohtes, \& þissse worlde þeostro \& ermða þrowodan.}
\text{. . . Forþon we habbaþ nedþearfe þæt we ongyton þa blindness ure \textit{ælpeodignesse}; we send on þisse worlde \textit{ælpeodignesse}; we synd on þísse worlde \textit{ælpeodignesse}, \& swa waren síþþon se æresta ealdor þisses menniscan cynnes Godes bebodu abræc; \& forþon gylte we wæron on þysne wærc-síþ sende, \& nu eft sceolon oþerne eþel secan, swa wíte, swa wuldor, swe we nu geearnian willaþ. (Emphasis added)}
\end{quote}

All this mankind was in blindness, since the first men were banished from the joy of Paradise, and since [they] lost the heavenly light, and endured the darknesses and miseries of this world.

\begin{quote}
\text{. . . Therefore we need to recognize the blindness of our pilgrimage [or, exile]; we are in this world of pilgrimage [or, exile]; we are in this foreign world, and were [have been] so, since the first ancestor of mankind broke God’s commandments; and for this guilt we were sent to this banishment [or, exile], and now hereafter should seek another homeland, either in torment or in glory, as we now wish to earn.}\textsuperscript{v}
\end{quote}

A similar theological idea is also seen in \textit{Vercelli} Homily XI:

\begin{quote}
\text{For þæs ærestan mannes synnum, Adam[e]s, we wurdon aworpene of neorxna wanges eðe 7 on þas wræcworuld sende, 7 we swa syndon on þyssum middangearde swa we her nænin eðel ne habbað. Be ðon Paulus se apostol cwæð: ‘\textit{Dum sumus in corpora peregrinamu[r] a domino’}. He cwæð, sanctus Paulus: ‘Penden we bioð onlichoman, we bioð [e]lþiodige fram Gode’. We magon heonon us geearnian þone eðel 7 þone soðan gefean. Ne magon we þæra ægðer her on worulde agan, ac we sculon on þære toweardan gesitten þæt us is on eðle gehealden. To hwan sculon we secan on þyssum middangerde [ge]leornesse gefean on heofenum? (Emphasis added)}\textsuperscript{vi}
\end{quote}
Because of the sins of the first man, Adam, we were cast out from the native land of Paradise and sent onto this miserable world [or, exile-world], and so we are in this middle-earth as we do not have any homeland here. About this Paul the Apostle said: “Dum sumus in corpora peregrinamur[a] domino.” He said, saint Paul: “While we are in the body, we are exiles from God.” We may henceforth earn for ourselves the eternal homeland and the true joy. We may not possess either of them here in this world, but in the future we should possess what is held for us in the homeland. For what purpose should we seek in this middle-earth the joy of departure in heaven?

The two examples represent the Christian theological ideas and moral exhortations about human life which the Old English homilies emphasize in their teaching. Through analogy, these concepts are taught powerfully in conspicuous images of a series of binary oppositions: 

1. the one true homeland of paradise or heaven as opposed to this foreign land of exile on earth;
2. the true joy in heaven the eternal homeland with true joy as opposed to the transitory human life in this world, which is filled with pains and sufferings;
3. moral virtues and obedience to God’s commands—ways to earn access to the true home in heaven—as opposed to sinful behaviors and non-conformity to the rules and teachings of the church, which leads one’s soul to eternal damnation in hell;
4. light as opposed to darkness and blindness; and,
5. the soul and the spiritual as opposed to the body and the physical.

These binaries accentuate not only the importance of following the moral, normative codes of behavior of the Christian faith, but also the misery of the opposite. So in one of Wulfstan’s sermons, *Sermo in .XL.*, he compares excommunication to the fall of Adam and Eve:

> And sume men syndon eac þe nyde sculan of cyricgemanan þas halgan tid ascadene mid rihte weorðan for healican synnan, ealswa Adam wearð of engla gemanan þa ða he forworhte þa myclan myrhðe þe he on wunode ær ðam þe he syngode.\(^{viii}\)

And there are some men also who rightly must in this holy time be expelled from the church community for high sins, just as was Adam from the community of angels when he forsook the great joy in which he dwelt before he sinned.

In the obvious simile, sinful behaviors—including disobedience to the community’s law and regulations—are considered as deserving the punishment of exclusion. The condition of banishment, as suggested in the statement, “he forsook the great joy in which he dwelt before he sinned,” is depicted as miserable, unpleasant, and undesirable. However, in a more implicit sense, the passage’s analogy between excommunication and Adam’s fall may also hint at the possibility of redemption: as long as the sinner confesses and repents, there would still be hope for this sinner to be accepted back to the community due to God’s mercy.

These concepts may not be new or original in early medieval England. As early as the first patristic authors, Saint Augustine of Hippo as a representative figure, the idea of *peregrinatio* and its allegorical and spiritual meanings were already accentuated in their works on Christian doctrines.\(^{ix}\) What seems more intriguing in these homiletic analogies about the life and afterlife of human beings, then, is how the homilists use figurative, dramatizing, and loaded language to make the spiritual concept more convincing to their lay audience. First of all, the moral teachings are conveyed clearly through binary oppositions: as the oppositional images are very close to the audience’s daily life, it appears easier for the Christian worldview and teachings to strike a responsive chord in the audience. In addition to these binary oppositions constructed in metaphors, other images and themes used to emphasize the life-as-exile analogy also contribute to the hortatory rhetoric. A noteworthy example can be seen in the transitoriness and mutability of the earthly world, a motif that appears frequently not only in the Anglo-Saxon homilies but also in Old English poems, elegies particularly.
Accompanying the concept that every mankind is living in exile in this world as merely a foreign land, the transience of earthly things is also a theme that recurs throughout the hortatory homilies. The moral instruction about this theme is, again, delivered rather straightforward: (1) heaven is the only true home of mankind, from where mankind was banished because of their sins—being deceived by the devil, disobedience, and pride; (2) Christ, because of God’s mercy and forgiveness, comes to this world to redeem mankind, making it possible for them to earn access back to the holy communion with God in paradise through repentance, virtues, and good deeds; and, (3) since the real importance lies in the soul’s coming “back” to heaven, the earthly joys and bodily pleasures should be dismissed as vanity, hindering the soul’s salvation, and therefore one should devote oneself to virtuous behaviors in accordance with the teachings of the Church. This essential Christian worldview not only demonstrates how exile becomes a significant extended metaphor in this belief system and moral instructions, but also entails a number of other relevant figurative languages in expounding this extended metaphor.

Mankind, living in exile in this transient world, should avoid being indulged in the earthly pleasures and should make efforts to redeem their sins through virtuous good deeds and fighting against evils, so as to earn for their souls the salvation in the true home in heaven. In preaching this doctrine, the motifs of _ubi sunt_ (where are they now) and of journey are employed to accentuate the transitoriness of this foreign world of exile. The _ubi sunt_ topos has its origin in early evangelical writings, such as those by Isidore of Seville and by Gregory, and this literary and theological topos was adopted widely in Anglo-Saxon homilies. Scholars have already noticed how this motif recurs significantly in Old English elegiac poems to dramatize the emotional sense of loss and grief as well as in Old English homilies to bring “affective and didactic power” to hortatory themes of penitence and eschatology (Di Sciacca 366). According to these views and to some close analyses of relevant passages in the Anglo-Saxon homilies, the _ubi sunt_ rhetorical questions appears to be particularly significant with considerations of the pattern of binary oppositions between abstract ideas, for example, those between the past and the present, between the body and the soul, the physical and the spiritual, and, of course, between the exile condition and the home.

_Blickling_ Homily X has a central theme of death, eschatology, and the transience of the world, and in this homily the _ubi sunt_ passage is used to underscore how man must give up every earthly possession in time of death, when the body and the soul must be separated:

_lo!_ what else is it without flesh after the eternal portion, which is the soul, goes away? _lo!_ what else is the remainder but the food of worms? Where are then his wealth and his feasts? Where are then his pride and his arrogance? Where are then his vain garments with which he earlier adorned his body? Where then do his will and his sinful lusts come, which he practiced here in the world? Behold! He then shall with his soul alone rightly to God Almighty compensate all that which he here in this world committed as crimes.

In this passage, the _ubi sunt_ rhetorical questions are used with a tone of reproach and with a focus on the body: i.e., this rhetoric is employed to accentuate the antithetical images of the decayable body and the soul that must face the final judgment. The homiletic _ubi sunt_ topos,
on the other hand, is also frequently deployed with a different focus on the earthly things rather than the human body. A vivid example can be seen in *Vercelli Homily X*:

For þan nis naht þysses middangeardes wlite 7 þysse worulde wela; he is hwilendlic 7 yfellic 7 forwordenlic, swa ða riċan syndon her in worulde. Hwær syndon þa caseras 7 cyningas, þa þe gio wæron, oððe þa cyningas þe we io cuðon? Hwær syndon þa ealdormen þa þe bebedu setton? Hwær is demera domstow? Hwær is hira offermetto, butan mid moldan beþehte 7 in witu gecyrred? Wa is woruldescriptum, butan hie mid rihte reccen. Niþ þam leornerum na sel þonne leornendum, butan hie mid rihte domas secen. Hwær coman middangeardes gestreon? Hwær com worulde wela? Hwær cwom foldan fægernes? Hwær coman þa geornlicost æhta tiedon 7 ððrum eft yrfe læfdon? Swa lene is sio oferlufu eorðan gestreona, emne hit bið gelice rena scurum, þonne he of heofenum swiðost dreoseð 7 eft hraðe eal toglideð—bið fæger weder 7 beorht sunne. Swa tealte syndon eaorðan dreamas, 7 swa todæleð lic 7 sawle. Þonne is us uncuð hu se dema ymb þæt gedon wylle.

Therefore, the brightness of this middle-earth and the prosperity in this world is nothing; it is transitory and poor and perishable. So are the powerful here in the world. Where are the powerful caesars and kings, those who once were, or the kings whom we once knew? Where are the aldermen, those who made commands? Where is the tribunal of judges? Where is their pride, except covered with dust and converted to torture? Woe is to confessors, unless they make decisions rightly. It is not better for the teacher than the learner, unless they seek judgments rightly. Where did the treasures of the middle-earth come? Where did the prosperity of the world come? Where did the earth’s fairness come? Those who most earnestly strived for possessions and then bequeathed heritage to other, where did they come? So transitory is the excessive love of earthly treasures, indeed it is like the showers of rains, when it falls most fiercely from heavens and afterwards all quickly glides away—it is fair weather and bright sun. Just ass the earthly joys are unstable, so body and soul separate. Then it is unknown to us how the judge will do about it.

In this passage, the focus shifts from the body, and the tone is more delighted and hopeful than the previous one from *Blickling*, but the central theme of transience of the physical beings on earth is the same. With a similar focus on the pleasant yet transient nature of the world, Ælfric also uses the *ubi sunt* motif to dramatize his preaching in a fragment, a seventy-eight-line passage added to the sermon for the First Sunday after Easter:

Hwær beoð wyrtæ blastman on winterlicre tide?
Hwær beoð ealle ofetuu of eallum treowcyne?
Hwær beoð hi gesewene on winterlicum cyle
on ænigum beame, þe ealle eft cuciað,
on wyrtum and on treowum, þurh þone écan wyrtan,
eal swa eðelice swa hī hī ær geworhte?xiii

Where are the blossoms of plants in winter’s time?
Where are all the fruits of all kinds of trees?
Where are they seen in the wintry chill
on any tree, which will all again come to life
on plants and on trees, through the eternal Maker,
all as easily as he formerly made them?

While many other instances of *ubi sunt* passages occur throughout Old English homilies, these examples quoted above represent some typical contexts and didactic purposes

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underlying or accompanying the use of these rhetorical questions. Although the focuses may be different—that on the human body as opposed to that on the material objects or phenomena in this world, for example—the hortatory themes of the *ubi sunt* passages seem to resemble each other: namely, how transitory the earthly things and human bodies are, and how worthless it would be for a person to value them. Through the use of *ubi sunt* topos, this doctrine of focusing on and working for the soul and afterlife becomes dramatized and hence appears to be more convincing to a lay audience. The rhetorical power of such dramatization, moreover, lies primarily in the emotional resonance that would be invoked by a sense of antithesis: i.e., this present, transitory world filled with sufferings, as opposed to the future, eternal world after life that is filled with blessings and bliss. With this rather straightforward imagery, the connotation of the *ubi sunt* passages is that human condition in this world is like a condition of in-betweenness. The general humanity might still be attached—physically and/or emotionally—to the earthly pleasures, especially in view of Germanic warrior culture that places so much value on worldly fame, exploits, and companionship in the warrior band. Such attachment, however, cannot guarantee what they value most can last long and therefore the feeling of loss and nostalgia expressed through the *ubi sunt* topos can resonate powerfully with the homilies’ lay audience and thus seem especially convincing for them to pursue another end of the antithetical binary: i.e., the ideal true homeland afterlife to be reached by virtues and spiritual merits.

Related with the topoi of *ubi sunt*, of transient earthly delights, and, eventually, of human life as exile in this world, another noteworthy homiletic rhetoric is the motif of journey. At first glance, the journey motif appears to feature only in Old English poems but does not seem to recur as frequently and conspicuously in the vernacular prose homilies as other motifs that I have discussed so far. In a more implicit way, however, the motif of making journeys, both literal and figurative, is significant for the homiletic rhetoric of exile and moral injunction. A noteworthy example can be found in the *Vercelli Homily XVI*:

> Ac utan we gemunan hu ure yldran, þa ærestan men, þurh hwylc þing he ða eadelican life forworhton on neorxnawange, ða dryhten he ærest æt frymðe in gesette. Efene hie wæron þurh oferhygndnesse 7 þurh ungehyrsunnesse 7 þurh ða gitsunge 7 þurh ða wilnume þara gesynelicra þinga 7 þurh þone æt þæs beweredan treowes 7 þurh heora unnytan lusas, 7 þurh þas þing ða ærestan men wurdon ascofene 7 aworpene of neorxnawanges gefean. 7 nu se man se de þæt þencðe, þæt he of þysses gehorenlican worulde þone heofonlican rice begite, he ðonne sceall eallinga oðerne weg gefaran 7 ðdrum ðædum don.

> But let us remember how our parents [*lit. elders*], the first men, through what things they ruined the blessed life in Paradise, where the Lord first placed them in the beginning. Indeed they were through pride, through disobedience, through greed, through desire of secret things, through the food of the forbidden tree, through vain desires, and through those things that the first men were driven out and expelled from the joys of Paradise. And now the one who thinks that he may attain the heavenly kingdom from this perishable world, then he shall travel entirely another way and act with other deeds.

A comparison between this passage and other homiletic passages containing the theme of human life as exile may reveal that metaphorical ideas of life-as-exile and of life-as-journey are already connected implicitly and are considered as nearly the same. Even though the term *exile* (*wrecce*) by definition simply refers to a state of being cast out from one’s native land and may include possibilities of either static or dynamic conditions, in the homilies’ usage—intentionally or unintentionally—exile becomes automatically conceptualized as necessarily entailing a sense of movement, i.e., of journey.
This automatic merging of two meanings and motifs, therefore, is one of the most intriguing aspects that reveal more about rhetoric about exile and/or about journey that the homilists employ for their hortatory purpose. Just as the condition of in-betweenness is accentuated and dramatized through the *ubi sunt* motif, as discussed above, so here the motif of exile-journey can also be understood in a similar perspective: not only that human life is defined as in a liminal state (which may or may not be the same as an exile state), but that very liminality is then arbitrarily conceptualized as dynamic; the possibility of static in-betweenness seems to be ruled out. Moreover, as the ideas of exile and journey become unconsciously identified in the Anglo-Saxon vernacular homilies, this conceptual merging finds verbal expression in some common Old English words, such as *wrecsif*, a compound word meaning “exile-journey”, and *ælpeodignes*, which literally means “foreignness” but is often used in Old English to refer to pilgrimage, following the *peregrinatio* in Latin patristic tradition.

The processes of how the different denotations of exile, journey, and pilgrimage become connected and merged see intriguing, for such process give us a glimpse of how these concepts and terms are used in Old English homilies as rhetoric to serve the didactic aims. As I have discussed above, the binary oppositions, with one side conceived of as superior and preferable to the other, prevail in the exhortations of Old English homilies. Based on the life-as-exile analogy, the homilies teach their audience (1) that heaven is preferable to this earthly life (which entails much more pain than transient delights), not to mention hell (where one will go because of his/her sins); (2) that virtuous deeds are preferable to behaviors not conformed to Christian values, for the former is the only way for one to return to heaven after death; and, (3) that the soul is preferable to the body, since it is the soul that has the chance to return to heaven through salvation.

With the rhetoric about the exile metaphor, therefore, the homilies are able to accentuate not only these antithetical concepts but also how mankind is *progressing*—not just situated—in-between these binaries. Omitting the possibility of staying statically and merging the concepts of exile and journey, the homilies highlight the motion of progressing towards salvation as the best possible human condition, and this hortatory depiction is made possible through the rhetorical device of exile and its concomitant liminal and dynamic connotations. This rhetoric of exile, moreover, also shows how the preachers make efforts to accommodate the Christian doctrines and worldview to the Anglo-Saxon society, particularly the frequent occurrences of banishment due to feuds and socio-political turmoil. With the subtly arbitrary identification of the two ideas, exile and journey, the homiletic rhetoric seem able to work effectively and make the life-as-exile metaphor logically convincing. In this way, this rhetoric does not simply contributes positively to moral exhortation and doctrinal instruction, but it even appears to blur the boundary between the figurative and the literal, i.e., making the audience accept the life-as-exile concept as a literal reality, and not just a metaphor. In this view, this may be one of the most successful examples of rhetoric.

References

Among the large number of studies of Anglo-Saxon homiletic texts, Mary Clayton’s “Homilaries and Preaching in Anglo-Saxon England,” *Peritia* 4 (1985): 207-42, provides an examination of the vernacular homiletic writings found in the *Blickling* and *Vercelli* manuscripts, and those by Ælfric and Wulfstan, which type of preaching text and collection they belong to, and how they reveal the preaching practice in Anglo-Saxon England. In addition to Clayton’s detailed and thorough study, Fulk, Cain, and Anderson, among other scholars, also offer a brief explanation regarding how to define the extant Old English homilies.
The Rhetoric of Exile in Old English Homilies

Fulk, Cain, and Anderson, History of Old English Literature, 72; Milon McC. Gatch, Preaching and Theology in Anglo-Saxon England: Ælfric and Wulfstan (Toronto: U of Toronto P, 1977), 120.

For observations and discussions with regard to whether the Old English homilies were aimed at preaching to a lay congregation or for monks’ or laity’s own private devotional reading, see Clayton’s article and Samantha Zacher, Preaching the Converted: The Style and Rhetoric of the Vercelli Book Homilies (U of Toronto P, 2009).


Similar teachings can be found in Ælfric and Wulfstan. See Ælfric’s Catholic Homilies I, 7 and Wulfstan’s Homily XV, ll. 18-26.


Peregrinatio literally means travel, exile, or pilgrimage. Originally in Roman law it referred to the state of being away from one’s homeland, and later the Church Fathers, in particular St. Augustine, used this word to advocate the idea that Christians should live a life of peregrinatio in the material world while awaiting the Kingdom of God; this idea spread widely throughout the Christian church. For a detailed analysis of Augustine’s concept of peregrinatio and its influences, see Manuela Brito-Martins’s article, “The Concept of peregrinatio in Saint Augustine and Its Influences,” in Exile in the Middle Age edited by Laura Napran and Elisabeth van Houts (Turnhout: Brepols, 2004), 83-94.


xiii For example, Patrick McBrine offers a study that is specifically focused on the motif of journey in the Christian poems in the Vercelli Book (2009).

xiv Scragg, 177-86.

*Third Place Paper, Winter 2014*

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In “Fractioned Idiom: Poetry and the Language of Autism,” Kristina Chew suggests a distinctive link between poetic language and neuroatypical language, particularly that of autistic individuals. By better understanding the poetic elements of neurodivergent language, she argues, we may be better suited both to understand “the 'random utterances' of those whose words may be few indeed” and to respond meaningfully. In “Toward a Postcolonial Neurology: Autism, Tito Mukhopadhyay, and a New Geo-poetics of the Body,” Ralph James Savarese argues that the “alternative embodiment” of neurotypical poets—such as Mukhopadhyay, who is autistic—“gives rise to both a different sense of relation and a different way with words,” one marked by the use and expression of metaphoric and metonymic associations, a “persistent animism,” and a “radical synesthesia.” Such experiences, argues Savarese, “arm” their neurotypical writer “in a world that is often quite hostile to the neurological other.” These poetic forms also offer an entry for neurotypical readers into a world of cognitive and emotional difference that must be experienced to be understood. It is a world often shunned by the “normal,” within which merely to exist is to be found “monstrous” and in which what is meant is often expressed only in the “white space” of what is not said. In Louise Glück's *The Wild Iris,* neurodivergence as depression is introduced but just as soon disavowed; throughout the poem, Glück distances her human speaker from the very poetic forms that mark neurodivergence by placing these forms in the “mouths” of the flowering plants that populate the human speaker's garden. In Anne Carson's *Autobiography of Red,* however, these same forms are attributed immediately and un-self-consciously to the main character, Geryon. By mapping neurodivergent poetic landscapes of animism, metaphoric and metonymic associations, and synesthesia in two different ways—one far, one near—these two poetic works suggest ways in which communication between the neurotypical and the neuroatypical might be not only possible, but practiced.

“It is impossible to overstate the impact of an alternative neurology,” notes Savarese, citing cognitive scientist George Lakoff’s assertion that the mind-body connection is so powerful that we can think “only what our embodied brains permit” (275, 280). In fact, the neurotypical brain may be limited even further. Savarese quotes an argument made by Julie Kane in “Poetry as Right-Hemispheric Language,” in which Kane points out that literacy, not neurotypicality per se, precipitates the shift from right-brain-dominant thinking and communication to left-brain-dominant, language-based communication:

If left-hemispheric dominance for language is not the 'natural' condition of human beings aged eight and older, but rather, a side effect of print literacy, then it stands to reason that the *qualitative changes in consciousness* between oral and print cultures—from community identity, “magical thinking,” pervasive animist spirituality, and poetry to individualism, science, and rationalism, faith-based religion or agnosticism/atheism, and prose—may be the outward signs of a fundamental shift from right- to left-
hemispheric structuring of conscious thought processes and memories. (qtd in R.J. Savarese 285)

Similarly, studies of brain activity and emotional response have found that when left-hemisphere activity inhibits right-hemisphere activity, affected individuals show a marked decrease in “actual felt empathy” and other emotional processes (E.J. Savarese 102). Or, as the human speaker of The Wild Iris notes in the sixth of the ten “Vespers” poems: “You thought we didn’t know. But we knew once, / children know these things” (44).

In addition to its association with poetic language, a dominant right brain is associated with a number of cognitive and mood disorders, including autism and depression (E.T. Savarese 102; Hecht 77). Thus poetic language may provide access to a right-brain-dominant world, even when neither the author nor the reader meets any diagnostic criteria for a disorder characterized by right-brain dominance. It is a world populated by figures of animism, metonym, metaphor, and synesthesia.

“Retreating Light”: The Wild Iris

The Wild Iris offers a “persistent animism” in its placement of key thematic concerns in the voices of plants, and it brings its readers into a world of neuroatypicality expressed in poetic language almost immediately. In the first of the seven poems titled “Matins,” the speaker alludes to and claims a “depressive” stance and establishes the credibility of the “plant voicing” begun in the preceding poem:

...Noah says
depressives hate the spring, imbalance
between the inner and the outer world. I make
another case – being depressed, yes, but in a sense passionately
attached to the living tree, my body actually curled in the split trunk, almost at peace....

...Noah says this is
an error of depressives, identifying
with a tree, whereas the happy heart
wanders the garden like a falling leaf, a figure for
the part, not the whole.

(Gluck 2)

This first “Matins” is preceded in the work as a whole by a poem titled, and voiced by, “The Wild Iris,” a piece that reads simultaneously as the (re)birth of a flower and the (re)turn from the depths of depression or the brink of suicide. Indeed, it is difficult to shake the sense of foreboding imposed by the lines of “The Wild Iris” as one enters “Matins” - and while this may be another “error of depressives,” it is also key to understanding the work as a whole.

In the postmodern era, animism that “voices” plants faces the risk of being reduced to or dismissed as “mere” pathetic fallacy. This is particularly true if, as Savarese explores, the connection between an animistic understanding of the world and poetry is essentially a right-brained one, most accessible to neurotypical individuals during the pre-literate years of life—that is, in a state of childishness (285). The first “Matins,” however, meets this concern head-on by dismissing both the speaker's depression and the reader's sense of foreboding in Noah's “breezy analysis”: “Instead of ontology, the garden's resident ironist discerns psychology; instead of tragic insight, the symptomatic “presentation” of temperament or disease” (Gregerson 117). By anticipating the “left-brained” response, the poem builds an affinity between the speaker's emotional response and the reader's residual foreboding – a foreboding cleverly built by the very animism the argument of “Matins” underscores (117).
What is this animism? *The Wild Iris* begins with a poem of the same name, in which the speaker is the growing iris plant itself. Its topic is death and rebirth; but, in its treatment of this theme, the poem addresses the very anxieties that arise from the logical/emotional conflict:

It is terrible to survive
as consciousness
buried in the dark earth.

Then it was over: that which you fear, being
a soul and unable
to speak, ending abruptly, the stiff earth
bending a little. And what I took to be
birds darting in low shrubs.

“Whatever/returns from oblivion/returns/to find a voice,” the wild iris reassures us. But we are not reassured. The terror of “surviv[ing]/as consciousness/buried in the dark earth” lingers. Rather than depression, we are left with an extraordinary anxiety. The first “Matins” justifies the intense mood only after the fact; for the time it takes to turn the page, at least, we occupy a right-brain-dominant world.

In this context, the speaker's retreat to the trunk of the “living tree” in the first “Matins” comes to the reader as a relief. It becomes even harder to take seriously the logic-bound, left-brained analysis that “identifying/with a tree” is “an error of depressives” (Glück 2). But is it true that “the happy heart/wanders the garden like a falling leaf, a figure for/the part, not the whole” (2)?

“For a Pathetic Fallacy to cause much emotional reverberation,” Empson writes, “it must be imposed upon the reader by an ambiguity” (40). That is, the pathetic fallacy and the animistic spirit that imbues it should not be immediately obvious to the reader; according to Empson, such animism should be an effect the reader “falls into” rather than one the reader sees coming (40). Although there seems to be no attempt to conceal the “pathetic fallacy,” there is little attempt to reveal it, either; the title of “The Wild Iris” and the other plant-voiced poems that follow it. What results is an effect that does not so much surprise the reader into a pathetic fallacy than lead the reader into an understanding of the poems on their own emotional, fundamentally right-brained terms.

In “Two Aspects of Language and Two Types of Aphasic Disturbances,” Roman Jakobson asserts that the two fundamental modes of communicating meaning are metaphor and metonymy (qtd in Chew). In the former, an association is made on the basis of a shared quality between the two things associated; the example Chew gives is the metaphor “Achilles is a lion,” which intends to link the two named entities on the basis of shared strength, courage, or ferocity. In the latter, an association is made on the basis of a shared contiguity between the two named entities; in Chew's example, the association of Achilles with Brad Pitt, because the latter was cast to portray the former in the film version of the *Iliad*.

Both metaphor and metonymy can be used to explain, organize, or illustrate the world by resolving two or more meanings into a single statement (Empson 48). Both, however, impose some level of ambiguity, as does all figurative language. This ambiguity, and thus the field of things encompassed in the association that are not stated, increases when the words used to build a metaphoric or metonymic association can be understood both in their associated sense and “simply as words in their acquired sense” (2). It looms largest when the intended association between the two named entities is not stated. Instead, “two statements are made as if they were connected, and the reader is forced to consider their relations for himself” (Empson 25). By equating two concepts, metaphor and metonymy confront the reader with an objective relation, rather than by presenting an analysis or a direct statement (2).
Metaphor and metonymy provide a means of organizing one's world and of communicating one's place in the world to others (R.J. Savarese 275). Yet when the ambiguity imposed by the stated-but-not-explained relationship is too great, the reader is left bewildered. Such is the case in the third of the seven “Matins” poems in The Wild Iris:

...I cannot love
what I can't conceive, and you disclose
virtually nothing: are you like the hawthorn tree,
always the same thing in the same place,
or are you more the foxglove, inconsistent, first springing up
a pink spike on the slope behind the daisies,
and the next year, purple in the rose garden? You must see
it is useless to us, this silence that promotes belief
you must be all things, the foxglove and the hawthorn tree,
the vulnerable rose and tough daisy – we are left to think
you couldn't possibly exist....

(Glück 12)

Here, the reader of the poem is not left baffled by the author's associations; rather, the speaker of the poem is left baffled by the call to associate the flowers in the garden with an absent God, one who confronts the speaker with an apparent objective relations, the existence of flowers, without bothering to analyze or explain. The ambiguity, in the speaker's mind, is absolute. Although she feels there ought to be a connection, that “the garden cannot simply be, the garden must mean,” there is nothing but the facts of the flowers to indicate there actually is a meaning (Davis 121). Are we to heed the call of the left brain not to see associations where they are not analyzed or explained, “to think/you couldn't possibly exist”? Or do we return to the right-brained, animistic, associative “faith”?

If the God of The Wild Iris is incomprehensible through metaphor, he is equally unapproachable via metonymy. In the first of the ten poems titled “Vespers,” the speaker attempts to establish an association via contiguity:

Once I believed in you; I planted a fig tree.
Here, in Vermont, country
of no summer. It was a test: if the tree lived,
it would mean you existed.

(Glück 36)

Here, the speaker is not attempting to see God in the fig tree on the basis of some shared quality, the way she once attempted to divine God's qualities via the staidness of the hawthorn tree or the inconsistency of the foxglove. Instead, she links the life of the tree to the existence of God via a third means: “you exist/exclusively in warmer climates” (36). The “part” of a useful summer crop represented by the fig tree comes to stand in for the “whole” that is the divine presence. “Perhaps/they see your face in Sicily,” laments the speaker; “here, we barely see/the hem of your garment” (36).

In The Wild Iris, metaphor and metonymy do not contribute to the narrative of the poem so much as to their argument. Actual examples of metaphor and metonymy are relatively rare, although a sample appears in the fifth of the ten “Vespers” poems: “...until the twilight makes/lamps of the first lilies” (Glück 42). Although the use of associations as a rhetorical device imposes a particularly dense ambiguity on the reader, it is an ambiguity that is psychologically meaningful to the understanding of the poems. By experiencing the attempts and failures to “join up” two parts of an association, the reader not only encounters the human speaker's theological difficulties and the despair they invoke, but actually feels it – a situation
that implies a powerful potential for poetic language to serve as an entry into neuroatypical modes of thought.

Metaphors may be described as “the synesthesia of several units of observation into one commanding image” (Empson 2). Synesthesia occurs when “apprehension in terms of one of the senses is described in terms of, or compared with, one of the others” (Empson 13). In neurology, the name refers to a condition in which sensory input which would seem to be accessible only to one of the senses is actually perceived by two or more senses at once (Spector and Maurer 108). The most commonly-reported form is “color-grapheme” synesthesia, in which letters or numbers are perceived as having specific colors; however, associations between any two or three other senses have also been reported (108). Although experiences of synesthesia are not linked to any one form of neuroatypicality, incidences of synesthesia appear to be higher in certain neurodiverse populations, including in persons with autism and depression (108). Poetically, synesthesia operates to conflate sensory modes, intensifying meaning in a single word or phrase while also imposing an ambiguous space in which meaning may dwell without disclosure.

In The Wild Iris, the plants serve as the primary synesthetes, connecting sensory details to bodily experience in a number of ways. “Trillium” opens by connecting the visual sensation of light to the tactile:

When I woke up I was in a forest. The dark seemed natural, the sky through the pine trees thick with many lights.

Later in the same poem, the trillium connects visual and auditory experiences more subtly:

I think if I speak long enough
I will answer that question, I will see whatever they see, a ladder
reaching through the firs, whatever
calls them to exchange their lives--
(Glück 4).

Here, the auditory experience of speaking, of hearing “whatever/calls,” is intertwined with sight. If the trillium “speak[s] long enough,” it will “see/whatever they see” - a sight with sound, one that “calls.”

Immediately following the sight/sound and sight/tactile associations constructed by the trillium, the voice of the lamium sets up one of the most vivid and most synesthetic similes in the entire work:

...I feel it glinting through the leaves, erratic, like someone hitting the side of a glass with a metal spoon.
(Glück 5).

The initial sensory experience of the sunlight is tactile, one that the lamium “feel[s].” This tactile experience is consistent both with the opening of the poem, which describes the lamium's “cold heart” and “trailling over cool rock,” as well as with the lamium's own comment that it rarely sees the sun: “leaves grow over it, completely hiding it” (5). The lamium instead feels the sunlight “gliming,” a visual descriptor, and “hitting the side of a glass with a metal spoon,” a jarring image that is at once auditory and tactile.
Just as associative thinking functions rhetorically in *The Wild Iris*, so does sensory experience – in at least one case. In the second poem titled “Matins,” the human speaker opens with these lines:

Unreachable father, when we were first
exiled from heaven, you made
a replica, a place in one sense
different from heaven, being
designed to teach a lesson....
(Glück 3)(emphasis added).

The use of the word “sense” here imposes an ambiguity. In context, it may be read both as “in one meaning” and “in one mode of sensation” - here, primarily visual, as the poem relies heavily on this theme, mentioning not only “darkness,” “dark red,” and “flesh colored” but also “the first tears/filling our eyes” (3).

Empson says of synesthesia, “It throws back the reader upon the undifferentiated affective states which are all that such sensations have in common...and may actually induce a sort of rudimentary disorder into his modes of sensation” (13). Although Empson describes poetic synesthesia, his statement implies a potentially useful mode for the synesthetic: one that can recreate a fundamentally neurological experience in the mind of the reader.

“Justice is Pure”: *Autobiography of Red*

Like *The Wild Iris*, Anne Carson's *Autobiography of Red* relies on a number of sensory and perceptive shifts, developed via language, to telegraph both what is said in the text and what cannot be said but only meant. A revoicing of the Geryoneis (the Geryon Matter) of Stesichoros, *Autobiography of Red* in fact opens with a line from Gertrude Stein: “I like the feeling of words doing as they want to do and as they have to do” (Carson 3). Through the use of the same poetic figures that populate *The Wild Iris*, *Autobiography of Red* does as it wants to do and as it has to do: the text draws the reader into an alternate sensory world.

While *The Wild Iris* handles animism, the “voicing” of flowering plants, with a careful distance that remains mindful of the accusation of pathetic fallacy, *Autobiography of Red* pulls the reader into a living world with no apparent consciousness that there's anything questionable about it. In Chapter I, “Justice,” we are introduced to a young Geryon for whom living objects are just as real as living people, or perhaps more:

...he studied stones as he trotted along behind.
So many different kinds of stones,
the sober and the uncanny, lying side by side in the red dirt.
(Carson 23).

Throughout his childhood, Geryon continues to occupy a world in which everything lives. The “new ending” to his first written autobiography, which originally ended with Geryon's death, does not mention either Geryon or Herakles at all. Instead, this new, “happy” ending notes only that “All over the world the beautiful red breezes went on blowing hand/in hand” (38). As Geryon begins to create his photographic autobiography, however, his animistic world begins to drop away. This transition, fittingly, is summed up by a description of a photograph in which animistic behavior plays a key role, in “Mitwelt”:

The last page of his project
was a photograph of his mother's rosebush under the kitchen window.
Four of the roses were on fire.
They stood up straight and pure on the stalk, gripping the dark like prophets.
and howling colossal intimacies from the back of their fused throats.... (Carson 84).

At this moment, Geryon's animistic world and his passion for photography fuse; he is lost in the memory of both, jarred back to reality only by the feeling of “something solid/land[ing] against his back” (84).

The memory of the roses also provides one of the most overt instances of synesthesia in Autobiography of Red. The seventh-grade science project that results in the photograph of the howling roses begins when Geryon “began to wonder about the noise that colors make”:
Roses came roaring across the garden at him.
He lay on his bed at night listening to the silver light of stars crashing against
the window screen. Most
of those he interviewed for the science project had to admit they did not hear
the cries of the roses
being burned alive in the noonday sun. Like horses, Geryon would say helpfully, like horses in war. No, they shook their heads.
Why is grass called blades? he asked them. Isn't it because of the clicking?
They stared at him. You should be interviewing roses not people, said the science teacher. Geryon liked this idea. (Carson 84).

Savarese notes that, for many neuroatypical writers, maintaining this kind of animistic perception works as a “refusal to allow language, in the words of [Dawn] Prince, to “cut up the world” or “cut groups of people from one another” (284). Rather than ordering the world into “self” and “other” through “a process of condescending classification,” writing that insists on including animistic and synesthetic views of the world insists on preserving a pre-literacy experience of language that “does not congeal or colonize” (R.J. Savarese 284).

Unlike in The Wild Iris, where both animism and synesthesia are deployed carefully and separately from the voice of the human speaker herself, in Autobiography of Red both are integrated wholly into Geryon's experience from the start. It is not until Geryon begins school that “justice” appears and “the world drops away,” signaling to Geryon once again that his experience of the world is not shared by others. It is a signal that recalls the production of Geryon's first written autobiography, in which his mother and teacher lament that he cannot seem to tell a story with a happy ending. Geryon's alternate ending for the written autobiography persists in capturing his animistic and synesthetic view of the world, but it is not a conventional happy ending in any sense (Carson 37-8). When language and the rationality of science refuse to produce a common ground for Geryon and others to connect, he resorts to photography, in an attempt to tell his story more clearly.

For many neuroatypical individuals, “language is stripped down to its essentials, to nouns and verbs and adjectives”; it is “a continuous difficult poem steeped in metaphors, verbal echoes, word play” (Chew). This does not mean that it is difficult for neuroatypical individuals to master. Rather, it opens language in a different direction, suggesting possibilities in meaning, placement, and play that do not always make themselves recognizable in a more conventional context.

This experience of language permeates Autobiography of Red. Indeed, the book's proemium, “Red Meat: What Difference did Stesichoros Make?” warns the reader that this is precisely the case – although like many of the functions of the text, this one does not become clear until after the fact and perhaps even while read “in reverse,” the way we may or may not meet Stesichoros “on our way back” through the logic of Appendix C.
In the proemium, we are introduced to Stesichoros, who “came after Homer and before Gertrude Stein, a difficult interval for a poet” (Carson 4). But scarcely is Stesichoros introduced than we are thrown into a discussion of adjectives that echoes Chew's description of neuroatypical language: “Nouns name the world. Verbs activate the names. Adjectives come from somewhere else.... They are the latches of being” (4).

Before Stesichoros, we are told, adjectives were firmly “latched” to their various nouns. By way of example, the passage describes Homer's consistent use of adjectives in metaphor: blood is “black,” women are “neat-ankled,” and death is simply “bad” (4). Homer's metaphors constitute a “fixed diction,” in which the code (language) is more important than the substance it carries (meaning). Stesichoros, however, is said to have switched the direction of these priorities.

While the world before Stesichoros was clearly metaphoric, the “unlatched” world in which “all the substances in the world went floating up” is metonymic and synesthetic. Horses become “hollow-hooved,” children are “bruiseless,” and killings are “cream black,” adopting simultaneously a visual element, a tactile element, and an olfactory/gustatory element. (5)

Unlatched adjectives float throughout Autobiography of Red, reinforcing the synesthetic element through a constant interplay of metaphor and metonymy. In the school where Geryon attends kindergarten, the main corridor “was/a hundred thousand miles/of thunder tunnels and indoor neon sky slammed open by giants” (24). When Geryon is left to navigate this expanse of bright lights and percussive sound, the connections between the space and his proprioceptive understanding of it become too intense to bear:

Main Door rose before him. Perhaps-
peering hard Geryon made his way through the fires in his mind to where
the map should be.
In place of a map of the school corridor lay a deep glowing blank.
Geryon's anger was total.
The blank caught fire and burned to baseline. Geryon ran.
After that Geryon went to school alone.
He did not approach Main Door at all.
(Carson 24)

One has difficulty imagining Homer, or another classical poet in his vein, describing an “indoor neon sky slammed open by giants” or a “deep glowing blank” in one's memory, much less one that would “burn to baseline.” It is only in this world of free-floating adjectives, unlatched from their classical forms, in which Geryon's experience can begin to be transmitted.

Just as there is “nothing to interfere” in this world with the free association of adjectives and the nouns they describe in Stesichoros's “unlatched” world, there is also nothing to interfere with the flexibility of prepositions to “remap” the perceived world. To Stesichoros, insomniacs are not only sleepless; they are “outside the joy” (5). In the next section, “Red Meat: Fragments of Stesichoros,” this alternate ordering of the world indicated by freer preposition use continues into the first fragment with “Geryon's dream began red then slipped out of the vat and ran/Upsail broke silver shot up through his roots like a pup” (9)(emphasis added). Similar “remappings” of space and body appear throughout the central text of Autobiography of Red; one example appears in the chapter titled “Walls,” in which Geryon notes that “up on the overpass/the night was wide open/and blowing headlights like a sea” (55).
“Or If Not Not”: Ambiguity

The results of these sensory and perceptive shifts in Autobiography of Red are best summed up in the unfolding of Appendix C, “Clearing Up the Question of Stesichoros’ Blinding by Helen” (Carson 18). Appendix C adopts the language and format of logic by presenting its premises in a numbered, “if-then” format. At first, this format looks comfortably left-brained:

1. Either Stesichoros was a blind man or he was not.

2. If Stesichoros was a blind man either his blindness was a temporary condition or it was permanent.

3. If Stesichoros' blindness was a temporary condition this condition either had a contingent cause or it had none.

(App Carson 18).

Appendix C continues to reason in the same if-then format, arguing that Stesichoros may have made a “strong remark about Helen's sexual misconduct,” leading to his being blinded by Helen, and “either this remark was a lie or it was not” (19). But then the reasoning takes a noticeably odd turn:

10. If we are now in reverse and by continuing to reason in this way are likely to arrive back at the beginning of the question of the blinding of Stesichoros either we will go along without incident or we will meet Stesichoros on our way back.

... 13. If Stesichoros lies either we will know at once that he is lying or we will be fooled because now that we are in reverse the whole landscape looks inside out.

(App Carson 19).

If this line of “reasoning” begins to feel like the inside of Alice's Looking-Glass, it is by design (or it is not). The same distortions in sensory perception that affect reasoning in Lewis Carroll's imaginary world are at play here, with similar results. The “altered” language of the poem induces an altered and expanded sense of reality, language, and logic. If we are in fact “in reverse,” the placement of Appendix C before the “Novel in Verse” that situates us within the “whole landscape [that] looks inside out,” rather than after it, makes an odd sense.

“The question of Stesichoros' blinding by Helen” is never cleared up at all – at least, not in the lockstep logical sense in which the enterprise claims to begin. Instead, we are left with a deep sense of ambiguity about the whole thing. Appendix C ends with the confident assertion “If Stesichoros is a blind man we will lie or if not not,” but the reader has no such confidence: is Stesichoros a blind man? Does it matter, since the “logic” of the final assertion demands a denial of Stesichoros' blindness in either case? But if the final assertion demands a denial of Stesichoros' blindness in either case, have we “cleared up” anything at all?

In The Wild Iris, the human speaker is similarly full of questions. In the second “Matins,” she notes that while she, John, and Noah at least have been given “beauty/without alternative,” “we didn't know what was the lesson” (Glück 3). In the third “Matins,” the speaker's sense of absence and lapses in logic resolves itself into a question:

...we are left to think
you couldn't possibly exist. Is this
what you mean us to think, does this explain
the silence of the morning,
the crickets not yet rubbing their wings, the cats
not fighting in the yard?
Neurodiversity’s Lingua Franca

The fifth “Matins” begins and ends with a question: “You want to know how I spend my time? ...Or was the point always/to continue without a sign?” (25)

By the time the “Vespers” cycle begins, the speaker has abandoned questions in favor of assumptions without logic. In the first of the ten “Vespers” poems, the speaker plants a fig tree “Here, in Vermont, country/of no summer” (36). It is a test, phrased in the same if/then format that characterizes Appendix C: “if the tree lived,/it would mean you existed.” When the speaker notes that “By this logic, you do not exist,” the unspoken conclusion is that the tree did not survive. Yet even this “logic” cannot resolve the speaker’s uncertainties; after noting the conclusion of the fig tree experiment, the speaker goes on to contemplate the possibility that God does exist “exclusively in warmer climates,” where fig trees can thrive (36). Like the question of Stesichoros’s blinding by Helen, the question of whether God exists cannot be answered, and attempting to approach it by logical gateways only deposits the logician back where she started.

If Glück’s human speaker is unable to approach certainty, the God of The Wild Iris seems even less able to do so. “I cannot go on/restricting myself to images,” he declares at the end of his first appearance in The Wild Iris, “Clear Morning”: “I am prepared now to force/clarity upon you” (8). Yet the human denizens of the garden never achieve this clarity. In “Retreating Light,” the God-speaker approaches the limitations of language as a way of explanation:

...I told you, write your own story.

After all those years of listening,
I thought you’d know
what a story was.

...Then I realized you couldn’t think
with any real boldness or passion;
you hadn’t had your own lives yet,
your own tragedies.
So I gave you lives, I gave you tragedies,
because apparently tools alone weren’t enough.

(Glük 50). Yet even God finds himself limited. The humans he has provided with tools and tragedies do not actually develop into independent tale-tellers:

You will never know how deeply
it pleases me to see you sitting there
like independent beings,
to see you dreaming by the open window,
holding the pencils I gave you....

And I am free to do as I please now,
to attend to other things, in confidence
you have no need of me anymore.
(Glük 50-1).

The betrayal is contained entirely in the word “like.” As Gregerson notes, “Those who achieve authentic independence require no 'like’” (118). Here, the pencils as tools of written language stand in for language itself, but the separating, categorizing, and compartmentalizing nature of language remains. Just as Autobiography of Red captures Geryon’s apprehension of
the limitations of language and its inability to connect him with others, here the humans with their pencils are equally incapable of connecting via language to God, who pats himself on the back for having provided the “tools,” “lives,” and “tragedies” necessary to tale-telling without realizing that his creations are simply modeling independence: they have produced no named creation, and it appears this God would miss it if they did.

“Being a Soul and Unable to Speak”: Poetry as Communication

_The Wild Iris_ and _Autobiography of Red_ present two distinct approaches to neurodivergence. The former displaces the experience of neurotypicality, while the latter embraces it. _The Wild Iris_ seems to embrace depression, but the ironic voice also displaces it; throughout the cycle, the reader is encouraged to sympathize with the human speaker in the garden but not necessarily to empathize with her. _Autobiography of Red_, on the other hand, places the reader directly in the head of its “monstrous” protagonist, encouraging not only empathy but identification with Geryon and the poetic language that comprises his experience.

The nascent “neurodiversity” movement understands neurological differences merely as normal human variation and seeks to embrace the differing experiences and perspectives on the world that various types of neuroatypicality produce (E.T. Savarese 101). Emily Thornton Savarese writes, “With an understanding of neurodiversity, strengths can be accentuated, and the world can be altered to naturally support a full range of neurologies” (101). Kristina Chew argues that understanding neurodivergent language poetically may open the door to greater understanding and communication. Ralph James Savarese goes even further, arguing that poetic, neurodivergent language creates “a kind of political or ethical proprioception that not only contests typical arrangements of power and identity but reconfigures them as well” (R.J. Savarese 283). In the play of animistic perception, synesthesia, metaphor, and metonymy in Tito Mukhopadhyay’s _The Mind Tree_, Savarese sees a staunch refusal to allow language to “cut up the world” or “cut groups of people from one another,” in the words of autistic anthropologist Dawn Prince-Hughes (284). This language maps a new relationship to the world and among individuals even as it resists “a process of condescending classification” (283). “With Tito,” Savarese writes, again quoting _The Mind Tree_, “language steps lightly, provisionally; it neither masters nor replaces the object it names” (286). By using the language as a guide to destabilizing and ultimately dissolving boundaries between “self” and “other,” poetry may offer a guide to neuroatypicality that embraces rather than pathologizes difference.

To many neuroatypical writers, “language is written about as a thing foreign and external, separated and broken off, from the subject” (Chew). It is an “alien being” that must nevertheless be mastered if there is to be any connection, any interface, between the writer and the world. In this “torn-away” space, lyric becomes not only an expedient, but a necessity; it becomes a means to communicate with, and within, “a world that is often quite hostile to the neurological other” (R.J. Savarese 276). In _The Wild Iris_, the human speaker resorts to lyric introspection to deal with the pervasive disquiet of her situation, “imbalance/between the inner and the outer world” (Glück 2). It is an imperfect dealing, dealing “in a sense,” “almost”; regardless of her longing, the speaker remains consigned to a narrative, one for which she has been given no “map” to meaning (2). The plants in the garden exist almost exclusively in a lyric mode, and while the human speaker attempts to join them, her sense of separation remains profound. In _Autobiography of Red_, lyric navigates a similar space between the need for a mapped narrative and the terror of it that pulls the protagonist into a lyric space: the young Geryon, unable to create a mental “map” of his school that would allow him to navigate its imposing front doors and impossible hallways, nevertheless finds a moment of respite in the lyric final lines of “Justice,” “while the first snows of winter/floated down on his eyelashes and covered the branches around him and...
silenced/all trace of the world” (Carson 25). Unable either to come to left-brained, neurotypical terms with the demands of narrative or to surrender wholly to the wordless predawn of lyric, The Wild Iris end with a lullaby; Autobiography of Red, in photographs.

References

Does the Harm Principle Justify Criminal Drug Statutes Against Drug Use?

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According to a recent article published in the British Medical Journal Open, the efforts attempting to control the global illegal drug market are failing. Over the past decades in the U.S., drugs such as cocaine, heroin, and cannabis have decreased in their inflation-adjusted price while the purity of such drugs have increased. What is more, the U.S. spends billions of dollars annually attempting to reduce drug use and its negative consequences. In fiscal year 2015, President Obama has requested $25.4 billion for such purposes, of which $9.2 billion will be spent on domestic law enforcement. Nevertheless, in recent years—for example between 2002-2007—there was only a .2% drop in users who depend on, or abuse, illegal drugs. In addition, in 2010 of the 1,362,028 prisoners sentenced under state jurisdiction, 237,000 (or approximately 17%) were convicted for drug offenses; of the 197,050 prisoners sentenced under federal jurisdiction, 94,600 (or approximately 48%) were convicted for drug offenses.

These facts provide motivation, I believe, to enquire into a fundamental question with respect to illegal drugs: Why is recreational drug use a crime? We should be careful to note here at the outset that this question is not concerned with the prohibitions involving drug manufacturers or drug sellers; rather, the question centers upon the drug user: Why do we consider the act of using certain drugs as a form of criminal conduct?

Arguments put forth to justify criminal statutes against drug use are numerous and generally fall into three main categories: Moral perfectionism, harm to self, and harm to others. I believe harm to others is the strongest rationale of the trio capable of justifying the criminal statutes. I will, therefore, focus solely on the arguments put forth that drug use should be illegal because it harms others. I will adopt the Harm Principle, first articulated by John Stuart Mill, as the framework to approach this question. The first part of this paper will briefly characterize the Harm Principle and some of the difficulties in using this principle. Next, I will look at what I believe are some of the strongest arguments which the Harm Principle can put forth to justify the illicit status of drugs. In particular, I will claim that increased risks of harm to others and societal harm are the strongest arguments. Increased risks of harm will primarily be approached drawing upon the work of Douglas Husak and several criteria which he puts forth as possible methods of evaluating when risks of harm can be justifiably proscribed. Societal harm will be approached using Joel Feinberg’s model of aggregate harm. I will argue that both of these models fail to provide a sufficient rationale to justify the entire scope of the current criminal statutes against drug use.

The Harm Principle

The Harm Principle was formulated by John Stuart Mill in his work On Liberty. Mill described his work as examining “the nature and limits of the power which can be legitimately exercised by society over the individual.” For Mill, a fundamental problem with law hinged upon the tension between liberty and authority. In order to protect liberty while at the same time justifying the coercive nature of law, Mill formulated one, crucial principle: “the sole end for which mankind are warranted, individually or collectively in interfering with the liberty of action of any of their number, is self-protection. That the only purpose for which
power can be rightfully exercised over any member of a civilized community, against his will, is to prevent harm to others.”

Perhaps we should first get clear on who, exactly, the “others” are which the community is protecting. Mill seems to suggest that, at the very least, the others are members of the civilized community in question. For our intents and purposes, this would apply to any U.S. citizen living under U.S. jurisdiction. We might raise questions here about the status of non-U.S. citizens living in the United States, U.S. citizens living abroad, as well as non-U.S. citizens living outside of the United Stated; however, I think this restricted notion of the other will allow us to investigate the question at hand without seriously affecting the argument of this paper. We might also be concerned with the status of those whom the others are being protected against (i.e. those who harm the others); however, from Mill’s definition above, we can see that he is only concerned with members of the community in question (“any of their number”). Thus, in our case, we can again restrict this group to U.S. citizens living under U.S. jurisdiction.

We should also note some other major obstacles which face this principle before proceeding. Perhaps the most notable difficulty is to discern whether an action affects only the actor doing the action or society and others. After all, it would seem almost every action of an individual affects society in some manner. Mill was not insensitive to this difficulty. He asked, “How…can any part of the conduct of a member of society be a matter of indifference to other members? No person is an entirely isolated being; it is impossible for a person to do anything seriously or permanently hurtful to himself, without mischief reaching at least to his near connections.” In response, Mill argued that only when there is definite damage, or definite risks of damage, does liberty reach its bounds. Mill provides an example to demonstrate his point. He held that that “If…a man, through intemperance or extravagance, becomes unable to pay his debts, or, having undertaken the moral responsibility of a family, becomes from the same cause incapable of supporting or educating them, he is deservedly reprobated, and might be justly punished; but it is for the breach of duty to his family or creditors, not for the extravagance.” What Mill seems to be suggesting is that actions too remote on the causal chain cannot warrant proscription. We will deal with this conception and related problems in more detail below.

Another difficulty faced by those seeking to employ the Harm Principle is to give a clear definition of what constitutes as harm. This has proved exceedingly difficult. Of notable interest, Joel Feinberg has attempted to give an adequate formulation, arguing that harm is a setback to interest. Generally speaking, the idea is that when someone is harmed, they are worse off than they would have been otherwise. This formulation also has its problems which are beyond the scope of this paper. For our intents and purposes, using a putative conception of harm will suffice. In other words, we will recognize harm when we see it. Thus, although giving a precise definition of harm might be difficult, when we look at a particular case involving drug use and harm to others, we should be able to recognize whether the case in question constitutes as involving harm to others.

A final difficulty in using the Harm Principle, and of notable importance for the purposes of this paper, is to establish how much harm, or how much risk of harm, is sufficient to justify criminalizing an action. This problem is perhaps the most manageable of the three. Joel Feinberg noted two important factors involved in assessing when this is the case: the magnitude of harm and the likelihood that the action will result in harm. The relationship between the magnitude and likelihood of harm and the justification for criminalizing a conduct is spelled out by Feinberg: “the greater the probability of harm, the less grave the harm need be to justify coercion; the greater the gravity of the envisioned harm, the less probable it need be.” Feinberg refers to the combination of the likelihood and the magnitude of harm as risk, which is how I will employ the term for the remainder of this paper. To better see the relationship of risk with respect to the likelihood of harm and the magnitude of harm,
consider the following cases which both carry significant risk: (1) Driving 80 mph down a
country road at night carries a relatively low probability of causing harm to some other
person; however, should a harm occur, the magnitude would be great. (2) Second hand smoke
has a high probability of causing harm to others, but the magnitude is relatively low.
Attempting to quantify the exact level of risk needed to criminalize harm is beyond the scope
of this paper; rather, I will use a comparative approach and examine actions which carry a
similar risk to use of illicit drugs.

The Harm Principle and Drug Use

We are now in a position to apply the Harm Principle to test whether drug use causes
sufficient harm to others or poses a risk of harm to others significant enough to warrant the
current statutes. What is immediately apparent is that in most all cases of drug use there is not
direct harm to others. In other words, it is not the case that as a direct consequence of using
drug [x] another person [y] is harmed. For instance, in only a few exceptions is it the case that
a heroin user, by consuming or injecting heroin, causes direct harm to another person. Husak
helps explain: “One possible way to describe this distinction is to say that drug use is
indirectly harmful to others, whereas these other crimes are directly harmful to others. These
labels draw the following distinction. Every act of burglary or rape is harmful to others…By
contrast, not every act of drug use is harmful to others.”

One notable exception involves

pregnant women. We should note that this seems to fall outside of the scope of “others”
with respect to our definition above. Yet even if we do consider a fetus as an “other”, I do not
think this is what most people have in mind when they attempt to justify the criminal drug
statutes. Should cases such as pregnancy be a major concern, a law specifically oriented
towards pregnant mothers using drugs would seem more appropriate than criminalizing the
conduct in general.

It seems, then, the strongest arguments which can be brought forth using the Harm
Principle must involve risks of harm, where the act of using a certain drug is not in itself
harmful, but it raises the likelihood that some other harmful act occurs. In order to approach
this rationale, we will look at two general types of harm to others laid out by Feinberg: risks
of harm to private persons and risks of harm to the public, society, or state.

Risks of Harm to Others (Private Persons)

Using the Harm Principle, one can argue that certain activities carry a risk of harm to others
which should be criminalized by law. Generally speaking, of the two factors involved in risk,
it is the likelihood that some harmful event obtains which is the significant factor in question.
Husak helps us spell out this rationale. He holds that such laws “prohibit some conduct x
because it impermissibly increases the likelihood of harm y. Conduct x does not invariably
harm anyone, but it impermissibly increases the likelihood that a harm y…will occur.”
Husak proceeds to describe how this might occur: “Sometimes the probability of y is raised
because the agent who performs x is more likely to commit a subsequent harmful act.”

Some clear examples of current criminal statutes which prohibit activities based upon the
increased risk of harm include drinking and driving and speeding. For instance, drinking and
driving increases the likelihood of a subsequent harmful act (e.g. a car accident). Although the
likelihood of a car accident still might remain relatively low at certain blood alcohol content
levels, car accidents carry a significant magnitude of harm. Thus, even a slight increase in
likelihood might raise the risk of harm to such an extent we deem the action should be
prohibited.

Increased risks of harm are some of the most common arguments evoked against drug
use, such as the connections made between drug use and crime. For example, we might put
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forth the argument that someone who takes drug \( x \) is more likely to commit some harmful crime \( y \); thus, we can say there is an increased risk of harm from taking drug \( x \). As Husak notes, however, the scope of when it is justifiable to criminalize activities which create increased risks of harm has not been clearly defined. In response to this difficulty, Husak has put forth four principles which he argues should be requirements to justify making certain conducts criminal based upon their capacity to increase the likelihood of some harm. Although I take these to be prima facie principles insofar as they may have exceptions, I believe they offer a meaningful framework for evaluating risks of harm created by drug use.

The first principle Husak refers to as the “Inchoate Principle.” According to Husak, “Conduct \( x \) should not be criminalized on the ground that it increases the likelihood of harm \( y \) unless conduct that directly and deliberately causes \( y \) should also be prohibited.”\(^{xxii} \) The idea seems most fitting in cases where some act \( x \) increases the likelihood of a harm \( y \) indirectly through some other conduct \( z \). Suppose, for instance, that we deem drinking and driving \( x \) as unacceptably increasing the likelihood of a terrible car accident \( y \). Often, this risk is indirect; for instance, alcohol can create a certain disposition to drive recklessly \( z \). Reckless driving directly causes terrible car accidents. Thus, it would be strange indeed if we prohibited drinking and driving but not reckless driving.\(^{xxiii} \) With respect to drug use, such reasoning is prevalent. For example, Husak points out that many argue drug use causes an increased likelihood that people become unproductive and lazy, which in turn carries a risk that they might harm society through a reduction of productivity towards the common good. However, neither being unproductive nor lazy are forms of criminal conduct themselves, despite the fact that they directly cause the loss of productivity for the common good.

There may be exceptions to this principle that relate to drug use. For example, having a mental disorder is not criminal, yet it might be the direct cause of many harmful acts. Supposing there to be a drug which throws someone into this state of mind, we might think this qualifies as a reason to criminalize the drug but not the mental disorder itself. This reasoning carries weight and may very well hold for some drugs; however, I am not sure it will hold in most cases under further scrutiny. I think the burden of proof lies upon those attempting to uphold the prohibitions to demonstrate this is the case. There are at least two conditions which should be met for such cases: First, whatever the mental disorder, it would need to carry a significant risk of harm to others. Second, the drug itself would need to carry a certain likelihood that people who use it develop the mental disorder. What is more, by looking at alcohol as a comparative example, I think we have reason to be hesitant that the above objection will work in most cases of illegal drugs. Some rationale must be provided, then, as to why we deem such risks associated with alcohol consumption as falling outside the bounds of criminal law while those of the well-known illicit drugs fall within its scope.

The second principle is the “Triviality Principle.” Husak holds that “[c]onduct \( x \) should not be criminalized on the ground that it increases the likelihood of harm \( y \) unless \( y \) is a substantial harm.”\(^{xxiv} \) By substantial, I take Husak to be referring to the magnitude of the harm. In other words, if the magnitude of the harm is relatively low, then even under conditions where there is a high likelihood of harm, its risk would not warrant criminalizing the conduct. Thus, for example, consider a lazy drug user: Suppose we have the tools to calculate that using drug \( x \) will significantly increase the likelihood of a loss of productivity \( z \) which causes \( y \) amount of harm in each instance. Even if the likelihood of harm is high, it would seem in such cases that the magnitude of harm is significantly low—too low, perhaps, to criminalize the conduct.

This principle faces a significant challenge. It may be argued that, although it is true each individual instance carries a small amount of harm, taken as a whole, the aggregate is quite substantial. Much the same reasoning can be applied to littering: An individual case of
littering does not cause much harm to the environment, but taken as the whole the harm can be quite substantial. I will not deal extensively with this challenge here, as it will fall under “societal harm” and be dealt with in the next section.

The final two principles deal with causation. Husak’s third principle is the “Remoteness Principle.” He argues “[c]onduct x should not be criminalized on the ground that it increases the likelihood of harm y unless x and y are sufficiently proximate.”xxv In other words, if an action [x] is quite distant in the causal chain connecting the action with the end harm, this might be a good reason to deny that action [x] should be criminalized. Generally speaking, to see if some action is the proximate cause of some effect, a foreseeability test is used where we would ask the question: Could harm [y] have been reasonably predicted given action [x]? Determining whether some action can be considered the proximate cause of an event has caused a considerable amount of debate in jurisprudence. This issue is beyond the scope of this paper; however, a few brief comments should suffice for our purposes: First, we should note that concerns with proximate causation are not the same as those which are concerned with the “cause in fact”, also known as the “but-for” cause. In many cases, we may want to say that had a person not taken a certain drug [x], harm [y] would not have happened. This would pass the “but-for” test, meaning that without action [x], harm [y] could not have occurred, but this does not necessitate that it is a proximate cause of the event (i.e. that it was foreseeable). By and large, I think most of the harms which are connected with drug use are too remote on the causal chain to warrant the criminal statutes under this principle. Rather, I think what most people have in mind when they evoke a causation argument is that using drug [x] was the “but-for” cause of harm [y]. For instance, suppose someone takes drug [x]. This causes an addiction, which in turn causes numerous other events to take place, such as the user losing his job and money. At the end of the causal chain, the user commits a robbery and thereby causes harm [y]. We might say that drug use was the “but-for” cause of the harm (which will be dealt with more in the next principle): however, in terms of proximity, the use of the drug is quite remote from the actual harmful event.xxvi I think it would be a hard case to make that the harm in question was foreseeable, thereby providing a justification for the prohibition against use of the drug. Thus, it seems this principle will come of short of being convincing in most cases.

The fourth principle Husak terms the “Empirical Principle.” He holds “[c]onduct x should not be criminalized on the ground that it increases the likelihood of harm y unless there is an established causal connection between x and y in a reasonably high percentage of cases.”xxvii The concern here is not how close action [x] lies to harm [y] on the causal chain, but whether there is a strong causal connection between the two. This is perhaps the most powerful argument brought against drug use in favor of its criminalization, and I think it is what most people have in mind when they say that the use of a certain drug was the “but-for” cause behind some harm. Most commonly, this occurs in the form of arguing that drug use increases the likelihood of criminal behavior. There is certainly a strong correlation between drug use and crime. With respect to violent crime, according to the Bureau of Justice Statistics (BJS), “about 26% of the victims of violence reported that the offender was using drugs or alcohol.”xxviii In addition, Norman Miller and Sara Spratt, examining legal issues concerning drug and alcohol addiction, note that more than 50% of murderers were using alcohol, drugs, or both, at the time of their crime.xxx With respect to prisoners, the BJS notes “In the 2004 Survey of Inmates in State and Federal Correctional Facilities, 32% of state prisoners and 26% of federal prisoners said they had committed their current offense while under the influence of drugs.”xxx

At face value, these statistics make it seem reasonable to argue that, indeed, there is an established causal connection between drug use and criminal activity in a high percent of cases. Nevertheless, looking further into the issue, I think there are substantial objections against this argument. The first important point to call into consideration is what Husak refers
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The Hilltop Review, Winter 2014


to as the “systemic” effect of drug use leading to crime. According to Husak, this category includes “offenses within dealing hierarchies to enforce normative codes, retaliate for real or imagined crimes of competitors or informers, resolve disputes involving territory or possession of drugs, punish customers who fail to pay debts, and so on.” Thus, part of the problem in obtaining reliable statistic between drug use and crime is that many of the crimes might be drug related in the sense that, if there were not legal statutes making drugs illegal in the first place, such crimes would have never taken place. In addition, the fact that someone involved with drugs happened to be using drugs in a drug-related crime should not come as a surprise. For instance, if a drug dealer commits assault against a client who does not pay, the correlation that the dealer was on drugs at the time of the crime does not necessarily imply causation (that drug use was the culprit causing the crime) or at any rate that drug use was the “root cause”: i.e. that the drug was the fundamental cause or initiator of the criminal act.

Another reason to doubt that drug use, itself, is a significant causal agent in creating an increased likelihood of crime involves what Husak referred to as an “economic effect.” The basic argument here is that the correlation between drug use and crime can to a large extent be explained as resulting from the fact that drug users turn to crime in order to support their expensive drugs habits. Thus, it is not drug use per se that causes the criminal activity but rather the limited supply and high costs. These factors—caused largely by the legal sanctions placed upon drugs—result in drug users becoming poor and desperate to continue their habit. For instance, one could imagine that if alcohol were made illegal, there would be alcoholics who would commit crimes to get their drink. That drug users commit crimes in order to raise money for their drug habits is strongly corroborated by the BJS: “In 2004, 17% of state prisoners and 18% of federal inmates said they committed their current offense to obtain money for drugs.”

A third and perhaps most significant reason why we might call into doubt the causal connection is that, even supposing that drug use was a significant causal factor in crimes committed under the influence of drugs, there is a low likelihood that drug users actually commit crimes. Husak explains:

Therorists who believe that drugs cause crime must explain why relatively few users of recreational drugs become criminals. Although the majority of criminals may be drug users, the majority of drug users are not (otherwise) criminals. Continued criminality is more predictive of drug use than continued drug use is predictive of criminality. Approximately 14.5 million people use an illicit drug each month. Only a tiny fraction is arrested for crimes, although no one knows how many commit offenses that are undetected. The fact that only a small minority of drug users resort to criminality raises a serious difficulty for those who conclude that LAD [laws against drugs] satisfies the conditions for justified anticipatory legislation.

Thus, taking into consideration the factors noted above, I believe we have reason to doubt that this principle sufficiently establishes a justification for the drug statutes.

Using the four principles outlined by Husak help develop an account for when it is justifiable to criminalize actions which cause substantial risks of harm. As we can see, however, this argument faces considerable challenges if we are to be convinced. Nevertheless, there remains a strong case to be made that it is actually harm to society in general which justifies laws against drugs.

Societal Harm

According to Husak’s triviality principle, we should not criminalize risks of harm when the individual harm of each act is insignificant. Nevertheless, should we add each individual act
together, the aggregate harm to society can be quite significant. Thus, perhaps societal harm
provides a convincing rationale to criminalize the risks of harm created by drug use.

Societal harm, as argued by Feinberg, is a harm of public interest. Feinberg defines
public interest as “a ‘common,’ or widely shared, specific interest.” It is a common interest
which nearly all members of society have, for example, avoiding epidemic sicknesses,
providing a sustainable environment in which one can live, and having economic prosperity.
Acts can be considered harmful to society even if an individual act is relatively harmless
itself. For instance, a single act of littering causes little harm. Nonetheless, the sum total of
harm caused by all the individual acts in a given time might end up being quite substantial. If
the aggregate of the harms push us past a certain unacceptable level, then we have a strong
reason to prohibit such acts. Feinberg refers to these types of harm as “aggregate-harm.” Thus,
in the case of drugs, one might argue that although each individual use of a certain drug
causes a small amount of harm, the aggregate is substantial enough to warrant the criminal
statute.

Since we are dealing with drugs already proscribed, it is not enough to merely take
current aggregate to see whether we are past the unacceptable threshold. If one were to argue
that even with the current proscriptions we are past the threshold, this would not be
problematic, as this person would certainly not argue we should remove the prohibitions;
however, even if we think that the current aggregate is below the threshold, we must ask a
further question: What would happen to the aggregate level should we lift the prohibition on
drugs? This involves that we make a prediction about how many people would participate in
the activity (taking the drug in question) and project the change in the level of aggregate
harm. We should take careful note here, then, that the current level of aggregate harm need
not be past the threshold to justify proscribing an activity. For instance, for many illicit drugs,
we might say that currently the aggregate harm is lower than the threshold required to justify
proscription; however, should the drug in question be made legal, the aggregate might swell
to an unacceptable level. Therefore, one seeking to justify the criminal status of drugs
according to societal harm must convincingly argue that either drugs currently cause an
unacceptable level of aggregate harm or would cause an unacceptable level if not proscribed.
The later argument is what one might call the ‘epidemic scenario.’ The argument runs that if
drugs were to be decriminalized or legalized, it would result in an epidemic of societal harm.

Overall, societal harm seems to carry some weight at first glance; however, as we shall
see, I believe it faces significant challenges. First, since there is no objective threshold which
determines when there is enough societal harm to justify criminal sanctions, we must rely on
comparative cases. Such cases do exist, and I think they leave us open to doubt the aggregate
level is high enough to warrant proscription. In addition, I believe there is also reason to doubt
an epidemic scenario on a scale which would push us past the aggregate threshold would
occur.

First, let us examine the argument that the current aggregate level of harm created by
illicit drug use warrants its criminal status. This claim is open to doubt primarily on the
grounds that there exists other activities which cause a greater aggregate harm which are not
themselves proscribed. Most notably, this is the case with alcohol, which is interesting given
its affinity with drug use and crime. It seems fairly uncontroversial that the amount of
aggregate harm caused by alcohol is higher than that of most illicit drugs. Even if we assume
that alcohol causes considerably less harm on average per user than most illicit drugs, the
aggregate must still be far greater given that more people use and abuse alcohol than any
illegal drug. But what is more, there is evidence that alcohol is one of the most socially
harmful drugs in widespread use. For instance, recent research attempting to quantify the
harm to society from substance abuse was conducted in Scotland. The study found that
“[t]here was no stepped categorical distinction in harm between the different legal and illegal
substances.” On a scale of 0-3, the researchers averaged the scores of all users. The social
harm of alcohol was averaged at 2.70 coming in second only to heroin at 2.72. Other notable drugs included cocaine, which had a social harm score of 2.33, and cannabis which scored at 1.61, second to last behind magic mushrooms which had a score of 1.60.  

Three responses might be available to continue justifying the illicit status of drugs as a societal harm. First, one could argue that alcohol should, in fact, be illegal. I will not deal with this response as I do not believe most people actually hold it. If one were to use this line of reasoning, the issue would hinge upon the grey area of when there is sufficient harm to criminalize an activity. Second, one could argue that lifting the prohibitions on drug use would push us past the acceptable level of aggregate harm. I will deal with this criticism shortly. Finally, George Sher put forth the following argument, noting the parallels between illegal drugs and alcohol and stating that the arguments for criminalization of the two seem to stand or fall together: “the reason drugs take us past the threshold [referring to the permissible level of aggregate harm] is that alcohol has already gotten us part of the way there. It may be the case, in other words, that either alcohol or the use of drugs by itself would not produce more harms or bads than a reasonable society can tolerate, but that in combination they would produce harms and bads that surpass the threshold.” Ultimately, I think this argument stands or falls with the “epidemic scenario”, since this argument implies that should illicit drugs be decriminalized or legalized, then we would pass the harm threshold.

This brings us to the final argument we will examine in favor of the laws against drug use. It is a common argument in defense of the prohibitions: If drug prohibitions are removed (the argument is also commonly applied to decriminalization policies as well), the aggregate level of harm will exceed the acceptable threshold. In other words, by legalizing drug use, there will be a surge in the number of users which will significantly increase the aggregate harm. This argument, however, faces a significant challenge. Husak argues that there is simply no empirical data supporting the idea that should proscriptions be removed, a large amount of people would turn to drug use. He references a work by Robert MacCoun and Peter Reuter, which found that few people said they abstained from drugs, or quit after using drugs, for legal reasons. If this is true, it implies that we should not expect a significant change in drug use should the prohibitions be lifted. In turn, we should not expect a substantial increase in the current level of aggregate harm.

Part of the problem with the argument noted above is a lack of empirical evidence to support one side or the other. A recent case, however, corroborating the argument that use levels would not significantly change can be seen by looking at a decriminalization policy implemented by Portugal. A brief word about the policy: It is not a policy of legalization. Furthermore, drug trafficking is still criminalized. Possessing “for one’s own consumption” any of the well-known illicit drugs constitutes as an administrative offense, not a criminal offense. Administrative offenses can result in a fine between 25 euros and the minimum national wage; however, Glen Greenwald, reviewing the policy, notes “but such fines are expressly declared to be a last resort. Indeed, in the absence of evidence of addiction or repeated violations, the imposition of a fine is to be suspended.” Thus, despite not being legalized, users do not face harsh legal penalties. The effect on usage rates has been surprising and gives us reason to doubt what most supporters of criminalization argue. From 2001 (when the policy was implemented) to 2007, those aged 15-19 saw a slight decrease (2-3%) while those aged 20-24 saw a slight to mild increase (8-9%) in terms of their lifetime prevalence rates (how many people have consumed a certain drug over the course of their lifetime). Overall, then, there was only a slight increase in drug use by those aged 15-24. Granted, this policy was one of decriminalization and not of legalization; however, the “epidemic scenario” argument is commonly applied to both policies. This is not to say that if the argument fails with respect to decriminalization, then it also must fail with respect to legalization, but I believe this data gives us reason to doubt that an epidemic scenario would take place should drug use prohibitions be lifted altogether.
Conclusion

This paper sought to investigate whether the Harm Principle could provide a sufficient rationale to justify the current drug proscriptions. A few points are worth reviewing: Increased risks of harm are one of the most significant arguments used to justify the proscriptions against drug use. Using several principles laid down by Husak, I believe it evident that it is difficult to construct a wholly convincing argument that drug users create a risk of harm significant enough to justify the criminal statutes. Furthermore, the argument that drug users create enough social harm to justify the prohibitions also faces severe challenges. Thus, the Harm Principle does not provide a conclusive argument that drug users should face criminal sanctions.

References


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v The term recreational is employed chiefly to avoid the debate over whether or not drug use can be justified in terms of certain health benefits or as vehicles of self-discovery, religious experience and the like. The “health benefits” argument is most exemplary in drugs such as marijuana, in which medicinal purposes, such as mitigating the effects of glaucoma or treating certain forms of epilepsy, are argued for. The argument that drugs can be vehicles of self-discovery or religious experience has been employed particularly in reference to psychedelic drugs such as LSD. Such arguments, if true, certainly carry more force than does the recreational case, which is precisely why I think it germane to examine the legal status of drugs in light of this argument: if the argument holds for recreational purposes, it certainly holds for the others. This approach was also used by Douglas Husak. See, Douglas N. Husák, *Drugs and Rights,* (New York: Cambridge University Press, 1992).

vi It is worth pointing out that federal drug proscriptions in the United States are relatively new statutes. Before the Food and Drug Act of 1906 and the Harrison Act of 1914, no federal laws existed regulating the use or sale of drugs. Although it was by no means the case that drug use was a condoned act, there were no criminal prohibitions. To give an idea of how accessible certain drugs were, James Inciardi, reviewing the history of drug laws in the U.S., noted “in the 1904 Sears catalog…heroin, barbiturates, and necessary injection paraphernalia were all advertised.” See James Inciardi, “Alternative Perspectives on the Drug Policy Debate,” in *The Drug Legalization Debate,* James A. Inciardi, Ed, 2nd ed, (Thousand Oaks, California: Sage Publications, 1999) 11. For a brief overview of the history of drug laws in the United States, also see David A.J Richards, *Sex, Drugs, Death and the Law: An Essay on Human Rights and Overcriminalization.* (New Jersey: Rowman and Littlefield, 1982) 158-165.

vii For more, see George Sher, “On the Decriminalization of Drugs,” *Criminal Justice Ethics* 22.1 (Winter 2003) 30-31. Sher refers to these as: the perfectionist argument, the paternalistic argument, and the protective argument. For a summary of the moralist argument see Richards, 168-177. For an overview of the paternalist (harm to self) argument, see Husak, *Drugs and Rights,* 71-144 and Richards, 182-185.

viii Moral-perfectionists tend to focus on worries such as the loss of self-control and the erosion of the moral character with respect to drug use. Although I believe these are significant worries, they often collapse into a concern about harm to others. For example, a lack of self-control seems problematic largely because of certain harmful consequences which seem more likely given that an agent lacks self-control. Somewhat related, the harm to self model is generally concerned with detrimental effects which
certain drugs have upon a drug user, such as the user’s well-being. However, here too, I think these worries often collapse into a concern about harm to others. For instance, it could be held that someone who harms their own health by drug use also harms society by requiring medical resources which they would not have needed otherwise. This discussion is merely meant to motivate why I selected the harm to others model. It might very well turn out that the moral-perfectionist model or the harm to self model can produce stronger arguments in favor of the criminalization of drugs with respect to the drug user. Nonetheless, even if this should turn out to be true, I do not believe it significantly affects the thesis of this work since the concern is solely whether a harm to others model provides a rationale for the statutes. A few legal cases also corroborate the idea that harm to others is the strongest rationale. For instance, State v. Kantner involved the constitutionality of a law prohibiting possession of marijuana. Justice Levinson’s dissent provides support for the idea that drug prohibitions are justified because drug use causes harm to others. In fact, he seems to support the adoption of the Harm Principle as the sole justification for any criminal statute. Levinson held “This principle that the State’s power to restrain private conduct is limited by the need to show social injury was recognized by this court in State v. Lee, 51 Haw. 516, 521, 456 P.2d 573, 577 (1970): ‘[W]here an individual’ conduct, or a class of individuals’ conduct, does not directly harm others the public interest is not affected and is not properly the subject of the police power of the legislature.” See State v. Kantner, 493 P.2d 315 (Supreme Court of Hawaii 1972) (Levinson J., dissenting).
I think it is also important to attempt to take into account the harms caused by proscriptions with respect to drug use and balance these against the harms caused by drug use in any aggregate mode.
On the Current State of Sociology

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Sociology today, much like other social sciences, is still alive and well but its actual place and purpose in contemporary society lacks much admiration. I suppose a legitimate question here is – is sociology really making a difference in society? Granted, the many practitioners and writers within the ambit of sociology, as a discipline, may find great pleasure in doing what they do (e.g., research and writing). But is that all there is to sociology – research, teaching and writing? Is the general US public, for instance, aware of any inroads made by sociology, if we can suggest that inroads and public progress is being made? Though sociology has come a long way since the days of its early pioneers, we’re still not too far removed from the vision of early sociologists like Émile Durkheim and his hope for the ability of sociology to be able to resolve real social issues. In other words, it is not enough to simply address social issues, like rampant inequality (economic and otherwise), but actually making a difference in terms of achieving resolution seems to be a goal that is constantly outpacing, if not eluding, sociology altogether.

In looking at the current state of sociology overall, then, one ought to take into consideration its historical trajectory – its rise, progress, or lack thereof. As such, one can argue that while sociology has burgeoned in research and writing on an array of subject matter - as in family sociology (Farrell et al., 2012), much is left to be desired of such progress in the public sphere (i.e., for the benefit of the masses), or even for the people themselves upon whom research is done. In other words are the research subjects themselves, for instance, benefiting from the research in any adequate measure? If so, how?

It can be thus be construed as gross exploitation for sociologists to continue to simply collect data from the poor and underprivileged, etc., without realizing or even purposely aiming toward real change in the lives of these ‘subjects.’ Thus, as is quite often the case, sociology becomes too embroiled in sociopolitical conceits (cf. Beliaev and Burtorin, 1982), or ethnocentric malaise. This suggests that in its study of society, sociology should also be concerned with the public’s benefit, as well as the public’s reception of sociology. In looking at sociology as the study of social relations and society, one observer, for instance, considers that it is also important for sociology to pay attention to its public reception (Smelser, 2003). In other words how is the general public understanding what sociologists have to say? If sociology is to be meaningful (to benefit as many as possible), then interaction or interface with various issues and the public, becomes critically important. After all, sociology should not just be for sociologists but rather a dialogue that spans an array of topics and be made relevant to a wide variety of people.

But in taking a look at part of the heart of the issue, i.e., addressing where the discipline is going substantively, methodologically, and politically, it is rather crucial that we now step back a bit and actually define the term sociology. In a broad but accurate sense, sociology can be seen as “the scientific study of social relations, groups, institutions, and society” (Smelser 2003:6). This suggests that sociology addresses both the one-on-one (micro perspective) as well as larger structures or groups (macro level) in its attempt to study society in an empirical and systematic way. But aside from that sociology also attempts to address the many social ills in society (such as socio-economic inequality or victims of drug abuse) as seen in applied sociology, for instance (cf. Zajdow, 2005). The critical part here is seen in the ‘attempt.’ In other words, many sociological practitioners attempt to address social ills and human suffering, while not necessarily offering any solution to these pressing social problems.
On the Current State of Sociology

Others, however, in their visions for sociology are committed to a more rigid scientific structure, remaining dispassionate and ‘objective’ in the process (Smelser, 2003). The point here is that in terms of where the discipline is going in the substantive sense, various sociologists think and operate differently in their vision quest. As such, although there are overarching methods and theories, etc., one would certainly not find every sociologist thinking alike in terms of their view of society and what that should be. Another way of looking at it is that some may place a heavier emphasis on maintenance of social structure, while others stress social change, and still others may pay more attention to the arts and aesthetics.

When it comes to the methodological sense, there is no one particular method that all sociologists use. In a more general sense, while the scientific method impacts both the founding of sociology as well as contemporary sociology (in terms of empirical outlook, etc.), various sociologists stress a variety of qualitative methods, quantitative, and mixed methods in their professional approach. In qualitative methods, for example, some emphasize the need for in-depth interviews for better understanding certain social issues (such as understanding Christian views on poverty and inequality). While it is true that quantitative analysis usually entails larger numbers (i.e., bigger samples) than qualitative analysis, it all has to do with the objective as well, for carrying out a particular research project. Thus, if a researcher’s goal is getting more at the rich information and thick description, then qualitative research is a more likely path to follow. However, it is also fair to say that multi-method approaches are not altogether shunned in the discipline (White et al., 2012). In terms of where the discipline is going methodologically, then, it all depends on the objective and research design of the sociologist.

Granted, more quantitative research attracts bigger amounts in terms of funding, and that also amounts to more publications. This seems to be a general trend that American sociology is following presently (i.e., leaning heavily toward quantitative research). In spite of that, some sociologists still see the benefit of engaging research ‘subjects’ in a one-on-one fashion, going in-depth to really get to the heart of an issue. But then again some practitioners will always find alternative ways to engage sociology in the real world. One sociologist did just that, as she saw herself more as a public intellectual, as opposed to one entrapped by the (sociological) institution (Gaines, 1998). From that standpoint, her (i.e. Donna Gaines) way of engaging sociology was by first finding that optimal freedom to engage; so that she wrote and spoke about social and cultural issues that were important to her—which she found as really stirring her passion in and about the real world (Ibid.). No doubt, her experience having to address a suicide pact of four teenagers also impacted her worldview (Ibid.) and sociological methods as well.

This is very crucial in gaining a broader scope of where sociology is heading methodologically, seeing that one can still find sociologists who break away from the norm of having their goals and priorities set by the institution. From somewhat of an opposite angle, another sociologist – Lynn Smith-Lovin, offers her perspective on the type of life that the discipline should take on. She argues that the more similar sociologists are in areas like their basic assumptions, core concepts and methodological techniques, the more likely the association between them and the bonds strengthened (Smith-Lovin, 1999). This is from the standpoint of sharing a common work agenda, whereby allowing communication to be more fruitful. While this seems to be sentiments shared largely within the sociological enterprise, one should be mindful of what Gaines refers to as ‘insider trading’ (1998: 457). This refers to the notion of talking to each other while ignoring the masses; e.g. not writing so that the public could understand.

In terms of where the discipline is going politically, it seems as though there is pressure for sociologists to conform to the boundaries set by mainstream journals, since individual and departmental rankings are also based on that (Calhoun and Duster, 2005). Sociologists from

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that standpoint are very careful not to upset the status quo. In other words, the idea is to toe the line so that acceptance can be gained within the institution. This is also the case since sociologists, like other professionals, depend largely on funding from outside sources, foundations, private donors, etc. And to receive funding also implies to go along with the established rules of the funding source. Unlike following the ‘mainstream’ for political reasons (such as funding, etc.), however, Burawoy shows how in the march of history, certain sociologists and social activists (like W.E.B. DuBois and Jane Addams) have left their definite mark both on society’s imagination and social awareness (Burawoy, 2007). This is making the point that in its pioneering and historical trajectory, some figures stand out for following their conscience (whether or not it meant going against the mainstream) and have been noticed by the sociological enterprise for their outstanding courage.

Through it all, in my opinion, sociology is sending mixed messages to the public and is not transparent enough. By this I mean that on the one hand you find a handful of sociologists who are willing to be relevant, to adapt their research orientation and method to suit a particular social issue. But on the other hand, many practitioners in the discipline are not willing to go against the norm or expected boundaries of the (sociological) institution. This can be seen as contributing to a great lapse or perhaps more of an immense lack of reflexive sociology, which is actually desperately needed in order for the discipline to earnestly engage society. In other words, to gain wider recognition by fellow practitioners, to keep in lock step with the rules of funding, or to simply follow the mainstream in order to maintain identity, many are willing to sacrifice originality, creativity, intuition and conscience for the sake of walking the straight line of institutional expectations. The very few who dare to deviate from that line are considered to be taking risks and may or may not be rewarded for it in the end. But it is well worth it to grab the reins of sociology and take the risk if by that, some greater good is intended and realized; and that means the public benefiting in a real tangible sense because someone cared. From that standpoint, a sociologist shouldn’t feel guilty for going the extra mile to see some burden alleviated to a great degree; for instance, helping single unemployed parents to get jobs to sustain themselves and their families. At the end of the day, then, sociology should be able to take an introspective look and feel good because someone walked the walk and not simply sat behind some office chair with only constant dreaming to call his/her own.

References


Title IX and the Impact on Athletic Leadership for Women

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Women slowly entered the higher education setting in the late 1700’s with a main focus of learning how to be better Christian wives, mothers, and teachers (Pasque & Errington Nicholson, 2011). For entertainment and social purposes, women began participating in events such as horseback riding, showboating, swimming, tennis, bowling, and archery (Bell, 2007). Women were discouraged from participating in any athletic activities beyond these activities because it was thought that there would be a decrease in a woman’s fertility and femininity through strenuous acts (Bell, 2007; Cohen & Kisker, 2010). It was not until 1896 that the first intercollegiate competition occurred for women: a basketball game between University of California Berkeley and Stanford (Bell, 2007).

Following this first intercollegiate event, there was a slow increase in interest, recognition, and acceptance for women’s participation in athletics at the collegiate level, despite the fast gains of men’s intercollegiate sports. The inequities that existed between men’s and women’s athletic teams were tangible on college campuses. There was an imbalance in the number of women’s programs compared to men’s, and the former often received little to no financing from the institution. Additionally, separate athletic departments were established in which separate male and female administrators ran each department. At the time, the segregated departments allowed for a great deal of opportunities for women to be leaders and administrators for women’s athletics (Pasque & Errington Nicholson, 2011).

Gender inequities between athletic departments received a great deal of scrutiny and were thought to be rectified by the passing of Title IX of the Education Amendments Act of 1972. The execution of Title IX expanded opportunities for female students in higher education yet had a profound impact on women in athletic leadership. According to Sax and Arms (2008), “…the implementation of the Title IX policies has also provided women with unprecedented opportunities in many areas of campus life, most notably athletics” (p. 24). The purpose of this document is to provide a history of the Title IX of Education Amendments Act of 1972, discuss the impact of Title IX on athletics and female administrators and to use feminist thought to frame the effect of this legislation. Finally, we will provide strategies for improving gender equity for women in collegiate athletic programs.

History of Title IX of the Education Amendments Act of 1972

The passing of Title IX was preceded by the Civil Rights Act of 1964, which prohibited discrimination based on race, color, national origin or religion in all federally assisted programs, but did not include sex discrimination. Six years following the passing of this act, congress held the first hearings on sex discrimination in higher education which led to the development of Title IX of the Education Amendments Act of 1972 which was passed on June 2, 1972 (Pasque & Errington Nicholson, 2011). Title IX of the Education Amendments Act states the following, “no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance” (NCWGE, 2012).

The intent of the law was to promote gender equity in all areas including access to higher education, career education, education for pregnant and parenting students, employment, learning environment, math and science, sexual harassment, standardized testing and
technology, and athletics (NCWGE, 2012). A popular thought is that Title IX is an entitlement program when in fact, it offers no special benefits for girls and women. It simply provides guidelines, procedures, and tools for addressing inequities and discrimination which can impact male and female students’ abilities to have a positive and successful experience in the educational system (NCWGE, 2012).

The passage of Title IX followed the feminist movement of the 1960s and 1970s and provided support for a significant change in policy and the purpose of educating women (Pasque & Errington Nicholson, 2011). There was an increase in focus on civil rights and civil liberties for all, supporting the development of the second wave of feminism and making the passage of the policy much more timely and powerful. The clear recognition that inequalities existed within government funded programs, especially collegiate athletics, was a positive step to fostering an environment of equality at institutions of higher education. Greendorfer (1999) suggests “the legal mandate creates tension with the hegemonic construction of gender as well as with the constellation of sporting practices that privilege males” (p.69). This tension was evident in the implementation of Title IX policy. Despite the fact that only 4% of the legislative text relating to sport, institutions across the nation routinely challenged Title IX on this issue (Greendorfer, 1999). The impact of Title IX permeates higher education as a system, a transformational change which is evident today.

**Impact of Title IX on Collegiate Athletics**

There is little debate about the benefits of Title IX for women’s equality in higher education; however, there continues to be debate over how and if the policy impacts men’s athletic programs. The law requires that institutions treat men’s and women’s athletic programs equally with regard to participation, scholarships, and benefits. There is no requirement that institutions spend the same amount of money on women’s programs as men’s programs, but that the opportunities are equal (NCWGE, 2012; Sawyer, 2009). In 1972, women’s programs received 2% of athletic budgets and scholarships were non-existent. As of 2009-2010, 40% of athletic budgets supported women’s programs and 48% of scholarship dollars at Division I institutions supported female athletes (NCWGE, 2012).

College athletics continues to struggle with the ramifications of creating gender equitable spaces in sport. Eliminating sex discrimination in athletics is challenging given the male positive socialization evident in athletics. The most celebrated teams in collegiate athletics are male, in spite of team performance and losses in revenue (Greendorfer, 1999). Social constructs historically limit women’s sports as a matter of maintaining femininity (Bell, 2007; Cohen & Kisker, 2010). The effects are far reaching, “sporting practice is a cultural production of the idealized male image transmitting messages of power symbolically represented by muscular strength -- as well as other socially constructed meanings attached to the male body and masculine gender role “(Greendorfer, 1999). Challenging idealized social constructs threatens collegiate athletics in that it is forced to disrupt the status quo (Greendorfer, 1999). As a result, the response to Title IX as it relates to college athletics is contentious.

The implementation of Title IX resulted in the development of several athletic teams in order to promote equity and there was a dramatic increase in the number of women participating in athletics. In the 2010-2011 year, the number of female-student athlete participants was six times that of pre-Title IX (NCWGE, 2012). Yet, statistical equality has yet to be achieved as women represent 57% of the national collegiate student body, but only 42% of intercollegiate athletics (Rhoads, 2004; Acosta & Carpenter, 2010).

It is often overlooked that the implementation of Title IX not only had an impact on student-athletes, but it also affected staff members. Prior to the passage of the policy in 1972, 90% of women’s teams were coached by females and today 43% of women’s teams are
coached by a female. Additionally, the passing of Title IX led to the development of significant barriers for women in athletic leadership, which will be discussed in further detail below (Pasque & Errington Nicholson, 2011).

### Impact of Title IX on Women in Athletic Administration

The Civil Rights Act of 1964 and Title IX of the Education Amendments Act were incredible accomplishments in the fight for civil justice, especially through the lens of liberal feminist scholarship. These federal changes represented a systemic change that supported the philosophical ideal that the playing field was leveled for female student athletes and women leaders in athletic administration (Pasque & Errington Nicholson, 2011). However, as Nidiffer (2002) describes, separatism took shape which led to the decline of spaces controlled by women to further systemic oppression of women’s sport and its established female administrators.

The NCAA was one of the most vocal detractors of Title IX legislation. Forced to comply with the law, the organization made a concerted effort to take control of women’s sport, disabling the former women’s governing body for athletics (Greendorfer, 1999). In an effort to placate the organization, the senior women’s administrator role evolved out of the NCAA takeover (Greendorfer, 1999).

### History of Female Athletic Administrators

Athletic administration developed as a result of the agencies governing athletics and the need for organization with the growth of intercollegiate athletics. According to Pasque and Errington Nicholson (2011), the role of the women’s athletic director did not exist on campuses until the 1960s. These women were considered ‘guardians of women’s health’ and were often time physical educators who held faculty appointments. The athletic director role is thought to be the most prestigious within an athletic department as the position holds the most power and control over athletics (Acosta & Carpenter, 2010; Wright, Eagleman & Pederson, 2011).

Prior to the passing of Title IX, athletic departments were typically segregated and administration of each department was gender specific. Female athletic directors led 90% of women’s athletic programs (Pasque & Errington Nicholson, 2011). As stated earlier, this granted many women faculty status and the ability to participate at an administrative level. Following the implementation of Title IX in 1972, many men’s and women’s athletic departments were combined to create one department. As stated by Hult (2009), this meant that many women athletic directors were demoted to secondary leadership positions or out of administrative positions entirely (Pasque & Errington Nicholson, 2011). Marxist feminist scholarship supports the notion that capitalism is to blame for the inequalities that exist and that because fewer positions were available when departments combined, women were typically viewed to be at the bottom and were either cut of their positions or transformed into a lesser position (Pasque & Errington Nicholson, 2011).

The loss in leadership positions for females in higher education is not unique for women in athletic departments. Paque and Errington Nicholson (2011), state “women have historically faced significant limits on access to leadership roles since male and female students started being educated together” (p. 34). Often, women reach some sort of barrier blocking women from achieving more in their professional lives, often referred to as a glass ceiling, glass wall, or a glass floor (Ballenger, 2010; Bonawitz & Andel, 2009). Traditionally, women have other barriers and complications that inhibit their ability to rise to the top.

According to Pasque and Errington Nicholson (2011),
The demands of balancing family responsibilities, fears surrounding the sexual orientation of the deals and directors and the influence that may exert on their students, and social constructed barriers such as the ‘old boy’s network’ also offer important explanations for the underrepresentation of women leaders in higher education today (p. 43).

The socially constructed barriers and culture of athletics have created an environment in which many women struggle to obtain and maintain their identity (Wright, Eagleman & Pederson, 2011). Yet, many women are successful contributors in various positions within athletic administration.

**Current Climate for Female Athletic Administrators**

Of the 348 member institutions of the National Collegiate Athletic Association (NCAA), females represent 34.9% of athletic administration staff (Acosta & Carpenter, 2010). The NCAA is the most notable and widely discussed organization for collegiate athletics; however, there are several other governing bodies which are not represented in that figure. Many of the other governing agencies represent small liberal arts institutions, community colleges and many religious affiliated institutions.

The NCAA is divided into three divisions, Division I, II, and III based on financial ability to give athletic scholarships and also size of institution (Matheson, O’Connor, & Herberger, 2012). At all Division I institutions, women hold 8.4 percent of athletic director positions (Pasque & Errington Nicholson, 2011; Sander, 2011). To compare to other female administrators in the academy that have a prestigious role, in 2006, 23 percent of college presidents were female (Sander, 2011). Additionally, Acosta and Carpenter (2010) report that 4.2 percent of Division I institutions do not have a lone female administrator at all.

The lack of female representation in collegiate athletic departments is alarming; yet, again not unique as higher education has traditionally followed patriarchal domination. Male dominated leadership can be found in many other professional areas and woven into faculty and administrative positions across the academy. It is known that traditionally, men and women have differences with leadership styles; yet, the qualities women have can be as valuable to organizations as that of men (Ballenger, 2010; Belenky, Clinchy, Goldberger, and Tarule, 1986). There is a cultural normalization that women are weak and that physicality and power should be used in traditional leadership settings (Dean, Bracken & Allen, 2010). Additionally, male normative communication is a preferred manner of leadership on collegiate campuses and leaders are expected to be direct, assertive, and dominant (Dean, Bracken & Allen, 2010). Athletics is based in rules, rituals and performance expectations which typically feed into the stereotypical male leadership style (Greendorfer, 1999). When women do not appear to possess these male-dominated qualities, they often are not considered for leadership positions which in turn affect the structure of athletic administration.

When Title IX was passed and athletic departments combined leadership positions, women had to adapt to assimilating to the traditional role of male figures or improve their status through dramatic efforts, referred to as superperformance (Dean, Bracken & Allen, 2010). Often, these efforts allow women to be recognized for their contributions, but create an imbalance in traditional gender qualities that are important in the workplace (Pasque & Errington Nicholson, 2011). Yet, these changes can promote work environments in which females prefer to work under male leadership because they have been conditioned to do so, questioning the notion of legitimacy (Dean, Bracken & Allen, 2010).

The discrimination and oppression on women in athletic administration can be supported by radical feminist scholarship. Cultural radical feminism explains that “the root cause of the problem is not femininity, but the low value that patriarchy assigns to feminine qualities”
(Pasque & Errington Nicholson, 2011, p. 6). While there have been improvements since 1972 in the number of women in athletic administration, there is a significant amount of work that needs to be done in order to create equal representation of leadership positions. Transformation of departments needs to occur in order to accept that women’s leadership qualities are as effective, but different, from that of the preferred male-dominated leadership style. Strength is valued in several forms and a change in perception could arguably alter the way athletic administrative leadership is viewed and valued (Pasque & Errington Nicholson, 2011). One way in which athletic administration has supported the role of females in athletic departments is through the position of the senior woman administrator.

Senior Woman Administrator

The National Collegiate Athletic Association (NCAA) created the position of the Primary Woman Administrator (PWA) in 1982 in order to help assist in the transition of men’s and women’s athletic departments (Tiell & Dixon, 2008). The role transitioned into the Senior Woman Administrator (SWA) in the 1991-1992 academic year but was not given a clear, uniform definition until 2006. The development of a position specifically for a female in an athletic department within NCAA institutions was a huge step in leveling the playing field, promoting gender equity, and providing female role models for women in collegiate athletics (Hatfield, L. & Hatfield, L., 2009; NCAA, 2010).

According to the NCAA (2010), the SWA position needs to be filled by a female in the department who can also hold an additional position within the department. Often, the SWA role is filled by a current athletic administrator, coach, or athletic trainer. The position is designed to deal primarily with women’s issues in order to promote and maintain gender equity in all operational areas of the department (Gill-Fisher, 1998). The woman in this role often holds other non-departmental leadership tasks like administration of intramurals for the campus, serving as the liaison for Student-Athlete Advisory Committee (SAAC), and party planning (Hatfield, L. & Hatfield, L., 2009; Tiell, 2004).

There are current debates over the duties, significance, and relevance of the senior woman administrator. Some of the conversation revolves around the notion that there has not been a need to identify a senior male administrator, some institutions do not designate a SWA, and the actual decision-making abilities of the SWA are unclear (Tiell & Dixon, 2008). The development of this position was a positive step for women in athletics and allows a lone female to have a leadership role; yet, the aforementioned issues might bring in to question the actual practicality of this position.

Suggestions to Increase Women in Athletic Administration

Significant time and attention still needs to be dedicated to improving the representation of women in leadership positions at collegiate institutions. It is known that women can be valuable to organizations and that proper mechanisms must be in place in order to allow women to flourish in leadership positions and fight the inequalities that exist (Ballenger, 2010; Pasque & Errington Nicholson 2011). In order to decrease the existing gender inequalities and improve the leadership opportunities for women in athletics, there needs to be a change in leadership development and mentoring.

Leadership Development

As discussed, women have taken roles in athletic departments that have been subordinate to that of their male counterparts which has led to less representation in leadership positions. Research by Nidiffer (2002) suggests that integrating frameworks for male and female
leadership should be viewed as normative and valuable indicating that a woman’s leadership skills need to be viewed and implemented as a valuable asset to any athletic department. Despite this, the climate for leadership development is low both in numbers of female leaders, and opportunities for intentional programs (Dean, Bracken, and Allen, 2010). Pasque and Errington Nicholson (2011) contend that women fail to reach higher levels of leadership due to the historical separations in education by gender. Women continue to feel isolated and unique in position and leadership styles, and as a result are slow to exhibit gender normative leadership characteristics. The opportunity for growth has not gone unnoticed. Several programs have been implemented to provide opportunities in leadership development. Common themes from research on these programs suggest the need for effective mentorship, the development of a network, introductions to professional organizations, job training and career planning (Dean, Bracken, and Allen, 2010). Literature on the subject also suggests that the success of these leadership programs is dependent of the affirmation of gender normative leadership styles, the normalization of women in athletic leadership roles, and the replacing of value judgments which socialize traditional female leadership traits as inferior to males (Pasque and Errington Nicholson, 2011).

Mentoring

Mentoring is a complex process that involves many components to be factored in determining effectiveness both from the mentor’s perspective and the protégé’s perspective. Cahill (1996) stated that the process of mentoring as a component of the professional-socialization process may influence how individuals prepare themselves and develop various values, skills, knowledge, and attitudes throughout their academic and professional careers. Hence, the importance of mentoring is recognized across disciplines in both academic and professional settings. This can prove to be quite important in terms of female administration as mentors and finding and cultivating the development of future leaders. Halfer and Sullivan (2008) took a look at the effectiveness of a mentoring program for new graduates just entering the workforce. They found a higher job satisfaction rate with those in mentoring programs to those not, predominantly due to the ease of transition and professional support they received. Thus the importance of modeling and professionalization by someone of the same gender would seem an important process to consider. With the low representation of women in athletic administration, same gender mentors are difficult to find. While women can find mentors in male figures, Scandura and Williams (2001) found that protégé’s reported greater role modeling behaviors in same-gender mentorships than in cross-gender mentorships which could be due in large part to the interpersonal comfort of the mentoring relationship (Allen, 2005). Women in athletic departments need a greater representation of other females in order to provide mentors, role models, and a guiding path to obtain leadership positions.

Concluding Thoughts

There is no question that gender inequities exist within collegiate athletics today. Significant improvements have been made since the passing of Title IX; yet, many would argue that the changes have not been enough. Inequalities continue to exist for female student-athletes on college campuses and most notably, there is a significant discrepancy in the balance of genders within athletic administration. As other areas of higher education receive attention for the existing gender discrimination, it is important that the inequities within athletic administration be at the forefront of concern. Female staff members and administrators provide significant opportunities for mentorship and role models for young female student-athletes. If student-athletes interact with more women in athletic leadership, perhaps there
will be an improvement in the number of women who continue to climb through the glass barriers that continue to exist today.

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Wi-Fi Determination Location for Semantic Locations

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1 Introduction

The prevalence of smartphones has increased demand for indoor positioning where GPS cannot reach. Because Wi-Fi has become ubiquitous, it is a natural technology to turn to for indoor location determination. Wi-Fi location determination, also known as Wi-Fi localization or Wi-Fi location estimation refers to methods of translating observed Wi-Fi signal strengths into locations. A “radio map”, consisting of sets of Received Signal Strength Indicators (RSSI) is stored as a “fingerprint” to be compared later to a signal scan to recognize the location of the device doing the scanning.

In Wi-Fi location determination literature, little attention is paid to locations that do not have numeric, geometric coordinates, though many users prefer the convenience of non-coordinate locations (consider the ease of giving a street address as opposed to giving latitude and longitude). It is not often easy to tell from the title or abstract of a Wi-Fi location determination article whether or not it has applicability to semantic locations such as room-level names.

The concept of a semantic location was defined in a paper from HP Labs, (Pradhan 2000), specifically to address an important deficiency—physical locations have little context information for mobile web-services. Pradhan defined a semantic location as a URI with context information. Semantic location have since been redefined through use as any symbolic location that can be expressed in natural language as stated in (Darabi et al. 2007), or that have particular meaning to users or applications (Roth 2005), as opposed to the use of geometric or physical coordinates (Roth 2005). An article is applicable to semantic locations if it is applicable to symbolic locations; semantic locations are symbolic locations that possess a single coordinate that is a symbol that can be understood by another person or piece of software.

Semantic locations, then, contrast with other types of locations, such as relative (defined in relation to a known reference point), absolute (defined by position on a coordinate grid shared with other locations) and physical (defined by geospatial coordinates—latitude and longitude) (Darabi et al. 2007). Other articles use physical as a synonym for geometric locations. The four types of locations can be divided into two classes of coordinate systems, symbolic and geometric, as in (Becker and Dürr 2005). Symbolic or semantic locations have symbolic coordinates, whereas absolute, relative, and physical locations are all defined by a set of geometric (x,y) coordinates. Geometric coordinates implicitly define distance between two objects, while symbolic coordinates do not. (Hightower and Borriello 2002) likewise contrasts physical position and symbolic location, as well as absolute versus relative. Given that three of the four types of locations defined in Wi-Fi localization articles have geometric coordinates and the fourth has symbolic coordinates, it is then logical that location systems built around semantic locations would be different.

1.1 Needs Met By Semantic Locations

Location is well known to be an important source of context for context-aware applications and is completely vital for the location-based services subset. (Roth 2005) delineates “The Role of semantic locations for Mobile Information access” as distinct from other location types or uses. Semantic locations are needed because in lieu of geometric
information, symbolic information is vital to location-based services. Systems that use semantic locations directly are needed:

- geometric x,y coordinates aren't always available to users or builders of location-aware systems
- symbolic locations often represent areas, whereas physical locations represent points (Roth 2005)
- not every location is the same size or shape
- not every location is stationary (for example “My Car,” “Flight 405”)
- semantic coordinates are easier to understand and more useful than physical coordinates “Semantic Location,” (Pradhan 2000) (Roth 2005)
- in many apps, symbolic locations are closer to what the user wants (GPS coordinates have to be translated so it is known they represent a coffee shop)
- in many instances, it is more difficult to get a physical location than a semantic one
- it makes no sense to waste cycles finding physical location information if your end goal is a semantic location
- rooms are seen by many users as being more important than geometric coordinates while indoors (Yang, Lu, Jensen 2009)
- geometric movement models suitable for outdoors are not suitable for indoors (Yang, Lu, Jensen 2009)
- indoor positioning is different and more difficult than outdoor positioning

The goal of a semantic location is different than the goal of a physical coordinate. The former’s goal is to communicate symbolic information to a user or application and the latter’s goal is to return a position in space that can be used for mapping or other distance-oriented applications.

1.2 Complications of Using Semantic Locations

Semantic locations simplify some aspects of system design, while complicating others. Many positioning methods require geometric information at certain reference points and cannot be used for symbolic locations. (Pradhan 2000) notes that symbolic locations can be ambiguous, difficult to sense, and too coarse for many applications.

1.3 Using Geometric Locations to Get Semantic Locations

Much effort has gone into turning physical locations from services like GPS into semantic locations for location-based services. (Cao, Cong, Jensen 2010) and (Juhong Liu, Wolfson, Huabei Yin 2006) focus on using physical coordinates to obtain semantic locations for use in mobile applications. Indeed, many commercial applications use GPS antenna or network-provided latitude and longitude to determine if a user is at a specific semantic location. In many cases this method will work, but in some cases, it will only waste battery time, and in others (such as “My Car”) may not even be viable.

Simultaneously, much effort has gone into finding physical locations for indoor locations, and as most GPS is unavailable indoors; no small amount of that effort going into Wi-Fi location determination. As physical location is often a means to get semantic location, it makes sense to skip the extra step for applications that can use semantic locations.

1.4 History of Semantic Locations in Wi-Fi Location Determination

The earliest Wi-Fi location determination systems did not consider semantic locations. The first algorithm, NNSS, supported them implicitly, though only as a mechanism to get to geometric coordinate information, and the second algorithm, k-NN (referred to as NNSS-AVG), implicitly excluded their use, requiring geometric coordinates (Bahl and Padmanabhan 1999). Prior to 1999 localization was largely a robotics domain, usually requiring geometric...
coordinates and more recently, focus has been on acquiring physical coordinates because semantic locations are adequately provided by proximity to a beacon.

1.5 Uses of Semantic Locations
Semantic locations are usually associated with smart homes and the “internet of things.” People want certain services associated with locations, for example to change the settings on their phone when they get to “the office” or to turn on the TV when they get to “the living room” or to turn on the lights when they reach “home.”

2 Wi-Fi Location Determination Methods
A few articles on Wi-Fi location determination explicitly mention symbolic or semantic locations, such as (Mantoro et al.) and (Mantoro and Johnson 2005), but often one must determine the applicability based on the algorithm.

There are three main types of Wi-Fi location determination methods: proximity, triangulation, and fingerprinting (or scene analysis).

2.1 Proximity
The proximity method uses a mobile device is within range of a fixed antenna for positioning. Proximity, by nature, gives symbolic coordinates (near antenna X), but if the antenna locations are known, they are often mapped to physical coordinates. Of course, the accuracy is no better than the radius of the antenna’s range. While that makes sense for short-range systems like the specialized Active Badge or Bluetooth, Wi-Fi location determination methods do not often use the proximity method because of the relatively long range of Wi-Fi, the cost, and the interference problems inherent in having too many wireless access points in the same physical space. So, while proximity methods inherently give symbolic coordinates, they have limited use when combined with Wi-Fi.

“Indoor Positioning with a WLAN Access Point List on a Mobile Device” describes a proximity-based method where each MAC address is mapped to a floor or wing of a building. No reference to symbolic or semantic locations is made.

A recent commercial standard is the Bluetooth LE iBeacon from Apple.

2.2 Triangulation
Triangulation is use the use of the angles and the length of the sides of triangles with basic trigonometry to determine a point based on 2 or more sources. Triangulation methods are by definition geometric and require distance coordinates to work. Lateration methods only require distances, but angulation methods also require angles to work. Since triangulation methods require geometric coordinates, they cannot be used directly with semantic locations.

2.3 Fingerprinting
Wi-Fi location fingerprinting takes a “fingerprint” of all visible antennas and their strengths as an identifier of how the radio signals should look at that location. Fingerprinting methods, a type of scene analysis, can sometimes support semantic locations and the determination is on a case-by-case basis. If a method requires manipulation of the geometric coordinates of a location, it cannot be applied to semantic locations, though if it can be modified to remove that requirement, it can be applied.

Fingerprinting can be either deterministic or probabilistic. Of the three main deterministic methods, only one is usable for symbolic locations because the others require geometric coordinates.
2.3.1 Deterministic Methods

2.3.1.1 Nearest Neighbor

Nearest Neighbor in Signal Space (NNSS), more commonly referred to as NN, is a symbolic location determination algorithm, as no averaging of geometric coordinates occurs. The signal strengths observed by the mobile device are simply measured against the signal strengths previously recorded for the same antennas, and the closest antenna in distance is chosen as the nearest neighbor. It was first introduced in (Bahl and Padmanabhan 1999) and works for semantic locations, though no special attention was given to the fact that NNSS does not require geometric coordinates. NNSS is based on the more commonly known Nearest Neighbor Search (NNS), also sometimes referred to as NN.

(Kaemarungsi and Krishnamurthy 2004a) presents a mathematical model of NN on a grid of locations to the end of designing such a system. This has direct applicability to symbolic space, as the primary criterion of success is probability of correct location estimation, but is an idealized case. The localization system designer is also the wireless network designer and it is only applicable to nearest neighbor, which is not the best available algorithm. While it might be rare that a location determination system would conform to a grid, the article is applicable to semantic locations on such a grid and some of article might be more generally applied.

One enhancement to NNSS is in “Wireless Indoor Positioning System with Enhanced Nearest Neighbors in Signal Space Algorithm,” which adds the additional criteria of a signal strength threshold and the number of antennas that may deviate beyond it.

Not every modification of NNSS can be applied to semantic locations, however, as some, such as kNN, add a requirement that geometric coordinates be used in the computation.

2.3.1.2 kNN

(Bahl and Padmanabhan 1999) contains a description of the first version of kNN for Wi-Fi fingerprinting (called NNSS-AVG) which doesn’t apply to semantic locations, as it averages the coordinates of the k=3 nearest neighbors in signal space without any special attention paid to the new requirement that the reference point’s physical coordinates be known.

(Yang, Lu, Jensen 2010) uses a kNN search but in the original sense (kNN outside of Wi-Fi localization is an old algorithm with much more general application in pattern recognition), but isn’t actually a Wi-Fi method at all; they assume the use of a symbolic proximity detection method such as Bluetooth or IR.

In pattern recognition, kNN is the more general form of NN and it is such a popular method for Wi-Fi location determination that even methods based on NNSS often say they are based on kNN with k=1. (Lee et al. 2010) is an example of an article that states that it uses kNN, implying its inapplicability to semantic locations, but upon closer reading, is actually based on NNSS. Redpin is another such system (http://www.redpin.org)

2.3.1.3 WKNN

WKNN, also referred to as KWNN, is the Weighted k-Nearest Neighbors algorithm, which averages the coordinates of the k nearest neighbors together, adopting the distances in signal space as weights. Since semantic locations have no geometric coordinates to weight together, methods that are a variant of KWNN or WKNN do not apply to semantic locations.

There are conceivably many more deterministic methods than there are programmers, but a simple rule of thumb applies: if the algorithm requires geometric coordinates to work, it cannot usually be used for semantic locations as the output of the algorithm is typically a coordinate and not a location name. Also, some modifications to kNN will not reap any benefits over NN if K is set to 1, so when considering a kNN variant, it is important to be sure of the impact of keeping that as a fixed constant.
2.3.2 Probabilistic Methods

Probabilistic location determination methods take the measured set of signal strengths of nearby antennas and compute the likelihood of each location in the fingerprint database being the current nearest location. Any probabilistic approach can be used, as long as only the most probable location can be computed by itself. Normally, in the case of relative, absolute, or physical locations, a probabilistic method interpolates the position coordinates by using the weighted average of the coordinates of all calibration points times their likelihoods (Darabi et al. 2007).

(Castro et al. 2001) is an example of a probabilistic system that returns semantic locations in the form of a most likely room name based on the time of day that the matching fingerprint was taken.

(Yang, Lu, Jensen 2010) is an example of a probabilistic method influenced by the kNN and named after it, while not even being deterministic.

(Ladd et al. 2004) uses a probabilistic Bayesian technique, which returns a trained position or state.

(Youssef et al. 2002) is applicable to symbolic locations, but makes no mention of the concept, nor really distinguishes in any way between types of locations. Two methods are described, a joint clustering technique and something called iterative trilateration, but with distances based in signal space, not physical space. The Joint Clustering Technique is further described in (Youssef, Agrawala, Shankar 2003)

(Roos et al. 2002) does not mention semantic or symbolic locations, but refers to labeling locations. The Nearest Neighbor method is compared to the histogram method and the Gaussian kernel method.

2.4 Multiple Methods

Many articles compare different methods, such as (Lee et al. 2010) which compares a probabilistic method to kNN with k=1.

(Navarro, Peuker, Quan 2010) is a senior project that tracks children on a playground and uses both nearest neighbor, a deterministic method and Markov Localization, a probabilistic method, to return a most likely location.

(Widyawan and Pesch 2007) uses the same one slope model and multi-wall models used in (Narzullaev, Park, Jung 2008). In the positioning phase the authors use NN as well as a particle filter method.

(Saha et al. 2003) considers location determination as a classification problem and evaluates a nearest neighbor classifier, a neural network, and a histogram matching classifier. Errors are measured in distance, but results are given by location.

(Correa et al. 2008) provides “Room-Level Wi-Fi Location Tracking,” and compares deterministic and probabilistic methods, concluding that it is a good compromise to store full histograms rather than averages or full result sets.

(Badawy and Hasan 2007) uses three methods: Nearest Neighbor, a neural network, and a decision tree. While not stated, the locations in question are symbolic, as evident by the fact that accuracy is measured in percentage instead of meters.

(Lin et al. 2009) uses a naïve Bayes classifier, an SVM, kNN with k=1, Redpin, and introduces WASP, all of which are methods of using Wi-Fi to determine semantic location. Rather than referring to symbolic or semantic locations, however, the article refers to rooms. It is clear that the authors have made note of the distinction, though, as they point that a benefit of fingerprinting is that the designers of the system do not need to know the physical locations of all of the wireless APs.
(Smialagic and Kogan 2002) uses both CMU-TMI (triangulation) and CMU-PM (fingerprinting), which is originally described in (User-Centered Interdisciplinary Design of Wearable Computers).

2.5 Other Methods
(Schloter and Aghajan 2006) implements a Support Vector Machine (SVM) for symbolic positioning in order to bypass the added requirements of a system that uses physical coordinates, which is acknowledged as an intermediary step along the way to symbolic locations for most uses.

(Yim 2008) describes a decision tree method the author compares to 1-NN, Bayesian, and other decision tree-based methods. While not explicitly stated, it is certainly more suited to symbolic locations than geometric.

3 Applying the Literature
In general, appropriate methods can choose a nearest neighbor without using physical or geometric coordinates or the geometric coordinates of any reference points. This includes any deterministic Wi-Fi fingerprinting method if k=1 (assuming a variant of kNN), as well as any probabilistic Wi-Fi fingerprinting method (without the interpolation or averaging step), returning just the single location with the greatest likelihood. Any algorithm that requires and returns geometric coordinates cannot be applied to semantic locations. This includes any WkNN variant, any triangulation method, and most kNN variants.

As we have seen, not every system is applicable to semantic locations. To date, most articles on wireless location determination have made little distinction between symbolic and geometric locations. The reader must take into account the considerations above for each method mentioned in a paper or a survey before knowing if it is applicable.

3.1 Taxonomy
Articles written about location determination systems for symbolic locations are often unintentionally obscured by their authors due to the lack of a specific vocabulary.

(Kjærgaard 2007) is an example of a proposed taxonomy that does not classify location determination systems by location type. It specifies area versus point or path as one of three spatial properties of the collection method. This fails to bring to the forefront the fundamental importance the distinction has on the rest of the system.

(Zeimpekis, Giaglis, Lekakos 2002) comes from a business perspective, where semantic locations are highly relevant, but also does not distinguish between geometric and semantic locations.

3.1.1 Accuracy
Accuracy and precision are often defined differently in location determination. Location accuracy is usually defined as error distance between the real location and the estimated one. Location precision is usually defined as percentage of correct estimations at a specific error distance. Location accuracy as typically defined for location determination has little or no meaning in symbolic location systems. Accuracy in articles specifically about systems for symbolic locations is just as often defined as percentage of correct location identifications, which is normally called location precision.

Distance, by any name, is an almost-ubiquitous error measure, even used by researchers whose systems have no concept of distance.

(Elnahrawy, Li, Martin 2005) actually uses different criteria for area matching, including its own definitions of accuracy and precision. The researchers make no reference to semantic or symbolic locations, referring instead to areas, tiles, or rooms. Rather than physical or
geometric coordinates, they refer to points. They developed three algorithms for area and compared to kNN as a representative of point-based algorithms.

3.2 Articles That Implement Methods For or Make Use of Semantic Locations

The following articles compare two or more different localization methods.

(Lee et al. 2010) uses kNN with k=1 and a probabilistic method.

(Ching et al. 2010) describes a system in a university environment with room-to-room accuracy, without mentioning semantic or symbolic locations. The authors used an unspecified deterministic algorithm that may be NNSS.

(Anderson and Muller 2005) uses symbolic locations by automatically creating zones, as well as using fingerprinting and a Bayesian Network.

(Hansen et al. 2009) describes how to configure semantic location determination in Streamspin, a mobile services platform for Windows Mobile devices.

(Kelley, Kaugars, Garrison 2011) makes use of any location algorithm for semantic locations.

(Yuen, Balasubramaniam, Din 2010) contains a method for improving kNN that could be applied to NN. The method deals with filtering out fluctuation in Received Signal Strength (RSS). RSS is typically indicated by a Received Signal Strength Indicator, an integer between -255 and 0 in theory, but commonly between -30 and -100 which either is or is proportional to the dBm, depending on the implementation.

(Sabbour 2007) is a 2007 Bachelor’s Thesis that implements two deterministic symbolic location algorithms for fingerprinting: Bahl’s Nearest Neighbor with Euclidean distance, and a range-based algorithm, which is based on each antenna’s RSS being within a specific range. The range-based algorithm chooses the room for which the most training samples match. NNSS was found to be accurate 10% more often.

(Jr. 2003) proposes a reference database of symbolic locations using doorways as reference points.

3.3 Surveys and Comparisons

(Darabi et al. 2007) and (Gezici 2008) both cover areas involving wireless position estimation, but not specifically semantic or symbolic locations.

(Gu, Lo, Niemegeers 2009) includes symbolic systems using a variety of technologies, such as RADAR (Wi-Fi), Active Badge (IR) (symbolic), and Cricket (Ultrasound) (semantic).

(Seco et al. 2009) describes kNN and Probability Density Function methods of fingerprinting, and explains that machine learning methods are better for symbolic locations than for physical (geometric) coordinates.

A number of comparisons of indoor positioning methods do not mention symbolic or semantic locations by any term, but do describe methods that can be applied to them. They also use mean or median distance error as their criteria for accuracy comparison, which has little applicability to locations with non-geometric coordinates (Lin and Lin 2005) (Wallbaum and Diepolder 2005) (Li et al. 2006) (Leppäkoski et al. 2010) (Honkavirta et al. 2009).

One notable exception is (Darabi et al. 2007), which describes the four location types, including symbolic. The authors still maintain the convention of measuring error in meters as a measure of accuracy, though precision, defined therein as percent correct within 0 meters, is also included.

That only one of these acknowledges the research into symbolic locations shows how little attention is paid to this area.

3.4 Articles That Apply Somewhat to Semantic Location Determination
(Swangmuang and Krishnamurthy 2008a) has some methods which can be applied to fingerprints for locations of any type.

(Bolliger et al. 2009) is applicable to improving accuracy of semantic location determination systems through better training of the radio map without additional effort. A symbolic location in this article is referred to as a label (for a location).

(Swangmuang and Krishnamurthy 2008b) focuses on cleaning up the fingerprint database (radio map), which could be applied positively to a method like NNSS, but could actually have a negative impact on probabilistic methods.

(Cook et al. 2009) applies just as well to symbolic or physical coordinates.

3.5 Articles That Apply to All Location Types

(de Moraes and Nunes 2006) use a probabilistic method of fingerprinting. Versions of this method have been used in Horus and other systems. The probability of the most likely location is calculated using Bayes' rule. The goal of this project is not a symbolic location, so it goes on to use one of two further methods to calculate physical position.

(Prasithsangaree, Krishnamurthy, Chrysanthis 2002) looks at ways of improving both symbolic and geometric locations, and describes them without ever using specific classification terms. (Essentially, NN and kNN are described). Improving NN by using weights of the first number of signal samples, then standard deviation was tested. They found no improvement with these weights.

(Leppakoski, Tikkinen, Takala 2010) examines the effect of histogram bin size in probability-based fingerprinting methods. There is no reason that the results wouldn't apply to symbolic locations as well, though the impact on accuracy would be different.

(Tsui, Chuang, Chu 2009) is something that could be applied equally to improving symbolic or geometric location determination methods.

(Kjaergaard and Munk 2008) is a solution to the problem of hardware RSS perception, which could be applied to symbolic, as well as geometric locations.

Filters such as those presented in (Suárez, Elbatsh, Macías 2010) are applicable to either kind of location.

3.6 Articles about RSSI

Most articles that focus on overcoming some problems of RSSI and Wi-Fi Location Determination apply equally well to symbolic and physical locations.

(Kaemarungsi and Krishnamurthy 2004b) is still applicable to symbolic of course.

(Chan, Baciu, Mak 2010) defines accuracy as percentage correct, so is more applicable to symbolic than geometric.

(Fang et al. 2010) is not all that useful for fingerprinting for symbolic locations, though there are commonalities.

(Tsui, Chuang, Chu 2009) could be used for symbolic locations.

3.7 Open Source Systems

Redpin (http://www.redpin.org) does provide symbolic identifiers, such as room name or number, and is said to be based on kNN where k=1. In other words, Redpin is based on NNSS.

Herecast (http://sourceforge.net/projects/herecast/) is an open source symbolic location system on Pocket PC hosted for providing location-based services (Paciga, 2005).

PlaceLab (http://sourceforge.net/projects/placelab/) is another open source system developed by Intel Research that ran on mobile devices including PDAs, phones and other devices that was meant to be local to the device and for large-scale environments (LaMarca, 2005).
3.8 Commercial Systems

A large number of commercial systems have been created that make use of or deliver semantic locations, including Foursquare, Facebook Places, and Twitter Places. Most of these systems use physical position and define the symbolic locations on top of those.

(Wexler 2006) looks at a handful of commercial systems.

3.9 Recent Developments

Especially in the retail space, in the last couple of years Apple's iBeacon has largely taken the place of other technology for location based services, however, research has not stopped completely.

(Baniukevic 2013) use both Bluetooth and Wi-Fi for location estimation, with the Bluetooth proximity representing a symbolic location at times and the Wi-Fi allowing the representation of a position on a grid.

Ariel (Jiang 2012) is a system for room localization that automatically learns fingerprints based on Wi-Fi and motion.

(Trawiński 2013) used a fuzzy rule-based multiclassification system to do Wi-Fi fingerprinting without knowledge of the environment nor additional infrastructure.

(Husen 2014) used Wi-Fi RSSI to establish both position and orientation of the users.

4 Conclusion

To this day, commercial apps for consumers like Foursquare are more reliable for building level locations, but benefit when they can provide services at the room level or below, and GPS signals will never reach inside many buildings. Even though many are interested in the location based services provided by having semantic locations indoors research into semantic locations seems to have fallen off in the last couple of years, as the iBeacon and competing or compatible systems have been released. An iBeacon allows you to identify that you are in the proximity of a particular place. A place with an Bluetooth LE iBeacon or equivalent. A building or campus with saturated WiFi and a good method for using that WiFi to determine location does not require the added infrastructure cost of a beacon at every location, but accomplishes the same thing with nothing more than the Wi-Fi antennas already in place. In such an environment, or in environments where theft or vandalism of beacons may be an issue, iBeacons may have been obsolete before they were announced. However, with research in this area largely having fallen off it seems iBeacon will become the standard for identifying semantic locations for location based services as it is cheap enough and easy enough for most anyone to implement.

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Advantages of a Finite Extensible Nonlinear Elastic Potential in Lattice Boltzmann Simulations

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1. Introduction

There are a great number of fluid-solid interaction problems in the real world such as locomotion of flagellum in the field of biology and fiber flocculation and dispersion in various industries.

Lattice Boltzmann simulation, an effective fluid simulation method, with a lattice spring model, a method to simulate solid deformation, is a powerful tool to deal with complex interactions between flexible solid structures and fluid flows. The lattice Boltzmann method has been extensively used to simulate dynamic motion of solid particles suspended in either laminar or turbulent flows. For solid domains, a coarse-grained model such as the lattice spring model (LSM) (Buxton, Verberg, Jasnow, & Balazs, 2005) has been employed to model the deformation and motion of flexible bodies in fluid flows. Recently, a generalized lattice spring model (GLSM) has been presented by considering three-body forces or angular bonds in addition to the two-body spring bonds (Wu, Guo, He, Liu, & Qi, 2014) so that the generalized lattice spring model can effectively handle bending deformation.

Both of the LSM and the GLSM only use the simplest potential, harmonic potential, to represent the bonds between adjacent particles. One of the defects of a harmonic spring is that the distance between two bonded particles can be extended infinitely if the spring force is large enough. The consequence of the defect is that the simulation may be diverged because two particles are excessively extended and overlapped when a large spring force is used for a relatively stiff solid body. To overcome the defect, a non-linear potential which is named finitely extensible nonlinear elastic (FENE) potential with Lennard-Jones potential (FENE-LJ potential), was proposed and used frequently in molecular dynamic simulations (Kremer & Grest, 1990) (Tirion, 1996). The advantage of the FENE-LJ potential is that two bonded solid particles cannot be extended too far due to an infinitely large potential well, which traps the particles. Therefore, we will borrow FENE-LJ potential to simulate dynamic behavior of flexible bodies in fluid flows within the frame of lattice Boltzmann simulation. The new solid structure model is named the generalized lattice nonlinear spring model (GLNSM). The important critical step is to identify a relationship between Young’s modulus, an important property of matters to describe extension, and the GLNSM (FENE-LJ potential) since deformation and motion of a flexible body is macroscopically determined by Young’s modulus. Unfortunately, to our best knowledge, how the macroscopic parameter, Young’s modulus, relates to the GLNSM (FENE-LJ potential) is not revealed so far.

The main contribution of the present work is that a detailed derivation of Young’s modulus from the GLNSM (FENE-LJ potential) is presented and we point out that a coefficient K in the FENE-LJ model is not directly equal to a spring constant used in the literature (Urgessa, 2007). The GLNSM (FENE-LJ potential) is used in lattice Boltzmann simulation for the first time. It is expected that the GLNSM can simulate more stiff structures in comparison to a linear harmonic spring.

In this article, Section 2 describes the GLNSM and its relationships to Young’s modulus. In Section 3, comparisons between the GLNSM and the previous model validate the
relationships which have been derived in Section 2. The final section presents the conclusion of the research.

2. Simulation Method

I. Immersed boundary lattice Boltzmann method

Immersed-boundary lattice Boltzmann method is a numerical method which combines the lattice Boltzmann method (LBM) and the immersed-boundary method. In LBM, a group of lattice nodes are used to represent fluid. Each node has distribution functions $f_\sigma$ and discrete velocity $e_\sigma$, where $\sigma$ depends on the chosen lattice model. The Boltzmann equation with Bhatanaga-Gross-Krook single relaxation time is

$$f_\sigma(r + e_\sigma, t + 1) = f_\sigma(r, t) - \frac{1}{\tau} [f_\sigma(r, t) - f_\sigma^{eq}(r, t)]$$

where $\tau$ is the relaxation time and $f_\sigma^{eq}(r, t)$ is the equilibrium distribution function at the position $r$ and the time $t$ as

$$f_\sigma^{eq}(r, t) = \omega_\sigma \rho_f \left[1 + 3(e_\sigma \cdot u) + \frac{9}{2}(e_\sigma \cdot u)^2 - \frac{3}{2}(u \cdot u)\right]$$

where $u$ is the fluid velocity. In this simulation, the D3Q15 lattice model is applied and the discrete velocity is given by

$$e_\sigma = \begin{cases} (0,0,0), & \sigma = 0 \\ (\pm 1,0,0), & \sigma = 1 \\ (0,\pm 1,0), & \sigma = 1 \\ (0,0,\pm 1), & \sigma = 1 \end{cases}$$

and the weight coefficient is

$$\omega_\sigma = \begin{cases} \frac{2}{9}, & \sigma = 0 \\ \frac{1}{9}, & \sigma = 1 \\ \frac{1}{72}, & \sigma = 2 \end{cases}$$

The fluid density $\rho_f$ and the momentum density $\rho_f u$ are given by

$$\rho_f = \sum_\sigma f_\sigma$$

$$\rho_f u = \sum_\sigma f_\sigma e_\sigma$$

The kinematic viscosity $\nu$ is related to the relaxation time $\tau$ and given by

$$\nu = \frac{1}{3} \left( \tau - \frac{1}{2} \right)$$

The immersed-boundary method coupled with the LBM was presented by Feng and Michaelides (2004). The fluid nodes are applied to a regular Eulerian grid, so every boundary solid node will not coincide with the exactly adjacent fluid node. Therefore, the fluid velocity at the boundary solid node can be extrapolated from the fluid velocity of the surrounding fluid.
nodes by using a discrete Dirac Delta function (Peskin, 2002).

$$D(r) = \begin{cases} 
\frac{1}{64h^3}(1 + \cos \frac{\pi \Delta x}{2h})(1 + \cos \frac{\pi \Delta y}{2h})(1 + \cos \frac{\pi \Delta z}{2h}), & |r| < 2h \\
0, & \text{otherwise}
\end{cases}$$

(8)

where the $h$ is the lattice length and $r = (\Delta x, \Delta y, \Delta z)$ is a displacement between a boundary solid node and a boundary fluid node. The fluid nodes are within a spherical volume $H$ of radius of $2h$, centered at a given solid node.

The fluid velocity $u_f$ at the position of the solid boundary node is given by

$$u_f(r^b, t) = \int_H u(r^l, t) D(r^l - r^b) dr^l$$

(9)

where $r^b$ is the boundary solid position and $r^l$ is the position of lattice fluid nodes within the sphere as shown in Figure 1.

Figure 1: (a) The small circles represent the fluid particles; the squares denote the solid particles; the large circles represent spheres around their central solid particle. (b) Step 1 shows that the flow velocities of fluid particles are interpolated to their central $k$th solid particle and step 2 shows that the reaction force of the $k$th boundary solid particle on the fluid is interpolated to its surrounding fluid particles. The arrows denote the interpolation from the fluid to the solid particle positions in step 1 and from the solid to the fluid particle positions in step 2. The figure is from Wu et al. (2014).

Only a part of particles on a plane are shown in Figure 1 to illustrate the interaction between fluid and solid particles in a three dimensional space. The small circles represent the fluid particles and the squares denote the solid particles. The squares with the thicker edges are the boundary solid particles which directly interact with their surrounding fluid particles within a sphere. For example, the velocities $u(r^l, t)$ of the fluid particles around the $k$th solid boundary particles (see Figure 1(a)) are interpolated to the $k$th particle position in step 1 (see
Figure 1(b) to have $u_f(r^b, t)$ using Eq. (9). Under the non-slip condition, the boundary solid node velocity is equal to the fluid node velocity, and thus the momentum difference represents the interaction force $F^{\text{int}}$ on the solid boundary over one time step as follows

$$F^{\text{int}}(r^b, t) = \rho_f (u_f(r^b, t) - u_s(r^b, t - 1))$$  \hspace{1cm} (10)$$

Next, the discrete Dirac delta function is used again to distribute the reaction force on the surrounding fluid nodes by

$$g(r^l, t) = -\int_F F^{\text{int}}(r^b, t) D(r^l - r^b) dr^b$$  \hspace{1cm} (11)$$

where $g$ is the distributed reaction force and $F$ is a spherical volume of a radius of $2h$, located at $r^l$. The force distribution process is illustrated in step 2 of Figure 1(b). Finally the reaction force term is added to the Boltzmann equation as follows

$$f_\sigma(r + e_\sigma, t + 1) = f_\sigma(r, t) - \frac{1}{\tau} \left[ f_\sigma(r, t) - f_\sigma^{eq}(r, t) \right] + 3\omega_\sigma (g \cdot e_\sigma)$$  \hspace{1cm} (12)$$

II. Generalized lattice spring model

In mesoscopic scale, the inter-particle force can be regarded as following Hook’s law. Based on this idea, Buxton et al. (2005) provided the lattice spring model (LSM) to represent elastic structures. In addition, Wu et al. (2014) have presented the generalized lattice spring model (GLSM), which used angular bonds instead of diagonal spring to treat bending deformation. The model consists of three parts as follows. First of all, a solid body is discretized into particles and the solid particles space regularly. Secondly, two adjacent particles are linked by a harmonic spring. In this way, the harmonic spring energy $U^s$ acted on the $i$th node is given by

$$U^s = \frac{1}{2} k_s \sum_j (r_{ij} - r_{0ij})^2$$  \hspace{1cm} (13)$$

where $k_s$ is the spring coefficient; $r_{0ij}$ is the equilibrium length of the spring between two neighboring particles $i$ and $j$; $j$ is nearest neighboring solid particle of the $i$th solid particle; $r_{ij} = r_i - r_j$. Three adjacent particles have a set of angular bond. The angular energy $U^a$ is given by

$$U^a = \frac{1}{2} k_a \sum_j \sum_{k \neq j} (\theta_{ijk} - \theta_{0ijk})^2$$  \hspace{1cm} (14)$$

where $k_a$ is the angular coefficient; $j, k$ are the nearest neighboring solid particles of $i$th solid particle; $\theta_{ijk}$ is the angle between the bonding vectors $r_{ij}$ and $r_{ik}$; $\theta_{0ijk}$ is the corresponding equilibrium angle.

The spring force is a two-body central force which allows either extension or compression between two solid particles, and the angular force is a three-body force which can handle bending deformation accurately. The sketch of GLSM is shown in Figure 2.
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The elastic force $F_i$ on the $i$th solid particle can be computed from the gradient of the total energy.

$$F_i = -\nabla (U_i^s + U_i^a)$$  \hfill (15)

The total force $F^T_i = F_i + F^\text{int}$ drives the solid particle to move. The leap frog algorithm has been used to update the position and velocity of each solid particle at each time step by using Newtonian mechanism. The details about the leap frog algorithm are referred to in Chapter 3 of the book by Allen and Tildesley (1987).

III. Generalized lattice nonlinear spring model

The generalized lattice nonlinear spring model (GLNSM) is similar to the generalized lattice spring model (GLSM). The only difference is that the harmonic spring is replaced by a non-linear spring force, which is a combination of FENE and Lennard-Jones potential. For the $i$th particle, the non-linear potential is given by

$$U^{\text{ns}}_i = U^{\text{FENE}}_i + U^{\text{LJ}}_i$$  \hfill (16)

where $U^{\text{FENE}}_i$ is the FENE potential and $U^{\text{LJ}}_i$ is the Lennard-Jones potential. They are

$$U^{\text{FENE}}_i = \begin{cases} \sum_j -\frac{1}{2}KR_0\ln[1 - (r_{ij}/R_0)^2], & r_{ij} < R_0 \\ \infty, & r_{ij} \geq R_0 \end{cases}$$  \hfill (17)

$$U^{\text{LJ}}_i = \begin{cases} \sum_j 4\eta \left[\left(\frac{\sigma}{r_{ij}}\right)^{12} - \left(\frac{\sigma}{r_{ij}}\right)^6\right], & r_{ij} < R_c \\ 0, & r_{ij} \geq R_c \end{cases}$$  \hfill (18)

---

**Figure 2:** The solid particles are located in a cubic lattice and the particle lattices are linked by springs and angular bonds. The figure is from Wu et al. (2014).
where $R_0$ is the maximum of length of bonds, $K$ is the non-linear potential coefficient, $\sigma$ is the distance at which the Lennard-Jones potential is equal to zero, $\eta$ is the potential depth of Lennard-Jones potential, and $R_c$ is the cutting radius of $U_i^{LJ}$. According to Kremer and Grest (1990), the relationships between parameters are usually set up as follows

$$R_0 = 1.5\sigma$$  \hspace{1cm} (19)

$$K = \frac{30\eta}{\sigma^2}$$  \hspace{1cm} (20)

Because $U_i^{LJ}$ is created by the FENE potential plus Lennard-Jones potential, the equilibrium distance $r_{eq}$ should have the minimum potential as shown in Figure 3.

![Figure 3: The FENE-LJ potential as a function of the ratio of $r$ to $\sigma$. The minimum potential is at $r/\sigma = 0.9609$.](image)

Therefore, the $r_{eq}$ is related to $\sigma$ as follows and the details are described in Appendix A.

$$r_{eq} = 0.9609\sigma$$  \hspace{1cm} (21)

The harmonic spring can be extended without limitation, whereas the FENE-LJ (non-linear) spring is restricted by maximum length of bonds $R_0$, and usually less 1.2 $\sigma$ (Kremer & Grest, 1990). The non-linear spring can represent the physical properties more precisely as well. However, the relationship between microscopic parameters and Young’s modulus is reported in literature. In order to obtain the relationship, a strain $\varepsilon$ and $r_0 = r_{eq}$ are assumed, and thus the force is expanded as a series of power of strain $\varepsilon$ at $r = r_0$. That is
\[ F(r_0 + r_0\varepsilon) = -\nabla U^{NS}(r_0 + r_0\varepsilon) \approx -\frac{942.8515\eta}{\sigma}\varepsilon + O(\varepsilon^2) \]  

(22)

where \( r_0\varepsilon \) is a small deformation. The first result term

\[ -\frac{942.8515\eta}{\sigma}\varepsilon \]  

(23)

is proportional to the strain \( \varepsilon \) and higher order terms are neglected. In Young’s modulus

\[ E = \frac{F}{A} \]  

(24)

\( F \) is the external force and \( A \) is the area. In this model, the area \( A \) is equal to \( r_0^2 \) as shown in Figure 4, so the Young’s modulus is as follows

\[ E \approx \frac{1021.1439\eta}{\sigma^3} \]  

(25)

Figure 4: The unit area of each node is a square (the red square) and its value is \( r_0^2 \). The figure is from Wu et al. (2014).

3. Results

In order to validate the results in the previous section, the locomotion of a filament in fluid is introduced. In Wu et al. (2014), the GLSM has been proved that its results are reliable, so we can use the equilateral parameters and compare the results between the GNLSM and GLSM.

An elastic cylindrical filament with the length \( L = 50 \), the radius \( r = 2.5 \) is constructed, and the simulation box \((N_x, N_y, N_z) = (64,416,400)\). The structure coefficients \((k_s, k_a) = (0.26,0.025)\) which represent Young’s modulus \( E = 0.26 \). The equilateral stiffness
parameters in GNLSM are $\eta = 0.000287$ and $\sigma = 1.0407$, which has the same Young’s modulus. Both the density of solid $\rho_s$ and the density of fluid $\rho_f$ are set to 1, $\rho_s = \rho_f = 1$. All above parameters are presented by non-dimension.

A driven point is located at the center of the cross section of the right end of the filament. The motion of the driven point follows a harmonic function

$$z = z_0 \sin \omega t$$ \hspace{1cm} (26)

where amplitude $z_0 = 0.1L$, $\omega = 2\pi f$ and driven frequency $f = 8Hz$. The maximum velocity for driven point is $v_{\text{max}} = z_0 \omega$, and the definition of Reynolds number is

$$Re = \frac{v_{\text{max}} L}{\nu}$$ \hspace{1cm} (27)

where $\nu$ is the viscosity of fluid. All cases are at $Re = 10.21$.

**Figure 5:** The comparison between the GLSM (red line) and GLNSM (blue line) at step is equal to T/4.
Advantages of Nonlinear Elastic Potential in LBM

Figure 6: The comparison between the GLSM (red line) and GLNSM (blue line) at step is equal to $2T/4$.

Figure 7: The comparison between the GLSM (red line) and GLNSM (blue line) at step is equal to $3T/4$. 
Figure 8: The comparison between the GLSM (red line) and GLNSM (blue line) at step is equal to $T$.

In Figure 5, Figure 6, Figure 7 and Figure 8, the wave patterns of the GLNSM agree well with the patterns of the GLSM. The results show that Eq. (25) can represent Young’s modulus precisely by the GLNSM.

4. Conclusion

In the present work, the generalized lattice nonlinear spring model (GLNSM) has been introduced into lattice Boltzmann simulation. The Young’s modulus, which is a significant property of matters to describe extension, has been derived from FENE-LJ potential for a cubic lattice solid structure for the first time. A comparison between the GLNSM and generalized lattice spring model (GLSM) is made. The simulation results validate the GLNSM and its relationship to Young’s modulus.

Appendix A

In order to investigate the relationship between Young’s modulus and GLNSM, the force function is necessary which can be derived from the derivative of potential.

$$F^{NS} = -\nabla U^{NS}$$

The parameters are set as Eqs. (19) and (20). The results of the potential $U^{NS}$ and the force $F^{NS}$ are shown as follows

$$U^{NS} = \frac{1}{2}(30 \frac{\eta}{\sigma^2})(1.5\sigma)^2 \ln \left[1 - \left(\frac{r}{1.5\sigma}\right)^2\right] + 4\eta\left(\frac{\sigma}{r}\right)^{12} - (\frac{\sigma}{r})^6$$

$$F^{NS} = -\frac{30\eta r}{\sigma^2(1 - \frac{4}{9}\frac{r^2}{\sigma^2})} - 4\eta\left(-\frac{12\sigma^{12}}{r^{13}} + \frac{6\sigma^6}{r^7}\right)$$
In addition, the equilibrium distance $r_{eq}$ is the distance at which the potential $U^{NS}$ is the minimum or the force $F^{NS}$ is equal to zero. Therefore, we solve the equation $F^{NS} = 0$ numerically and the result is shown in Eq. (21) and Figure 3.

References


Separation of the Petroleum System

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Introduction

I was an employee at the South Oil Petroleum Company (Dhi Qar, Iraq) for two years. During this time, I learned a multitude of vital information that is necessary for engineers who work with crude oil separation and crude oil separation equipment. It is substantial and beneficial for the engineer to understand the equipment. This research focuses on the extraction of petroleum from the ground as well as the remaining steps used in the separation process of oil from the gases, water, and other various chemicals. This study includes the side design for some important equipment that is used in the separation system in the field.

This research will directly help and inform the employees of the necessary details of working in the oilfield. This study will inform regarding how best to deal with various chemical materials, equipment, how to avoid operational mistakes, and how best to deal with and solve those mistakes if they do occur. This research is crucial since it explains in detail the overall process of separating crude oil and the crude oil storage process. It also informs of how to know the quality of crude oil based on the American Petroleum Institute (API) - as well as how to recognize various pumps which are used in pumping oil from oil tanks to the export. I will also share my own personal work experience and information gained from working at the Nasiriyah Degassing Station.

Overall, this study will provide engineers and employees who work in the oilfield with needed and detailed information about the equipment and the chemical and physical nature of the oil mixture. In tandem with this are the necessary steps to open and close the oil wells, how to control the pressure temperature of the mixture of oil, the equipment used in the separation of oil from water and gases associated, and how to maintain the ideal temperature and pressure to get the best process for the separation of oil with a high efficiency.

The Origin of Crude Oil

There are a multitude of theories that refer to the origin of crude oil. One of the more popular theories is that oil may come from the bodies of tiny creatures and dead plants. The general idea of this theory is that the residue of animals and vegetation were deposited at the bottom of the ocean millions of years ago. Rocks containing organic material, mixed with sand and mud, were carried by rivers flowing into the sea, where they settled, layer upon layer, on the seabed. Due to old classes being buried deeply, the dissociation of organic materials occurs based on weight and pressure. The pressure generates heat and then two factors (pressure and temperature) are playing an important role in the decomposition of the organic materials.

Radiation, chemotherapy, and bacterial representation turn to the organic matter components of hydrogen and carbon, which in turn, develop into the material that we now know as petroleum. It is believed that these layers have, overtime, accumulated numerous sedimentary rocks (such as limestone, sandstone, and dolomite, among others) formed from thin and fragile particles, that have arranged into solid blocks. This occurs due to the tremendous pressure that is generated as a result of the accumulation of these rocks on each other (8).
The Composition of Crude Oil

The hydrocarbon chains of Al-naphthenic paraffin and aromatic compounds are included in the basic installation of petroleum 80-90% g. There are a relatively tiny amount of oxygenic compounds, sulfur, and nitrogen, and the properties of the physical and chemical petroleum are defined by the ratio of the chemicals involved in the composition (2 and 5).

The Classification of Crude Oil

The petroleum classification system is of great importance, as it determines the direction of oil refining and it establishes a list of the types of products and their quality. The hydrocarbon’s composition affects the classification of petroleum. Petroleum contains some types of paraffins and other types of naphthenics - and those compositions have a direct influence on the overall classification of crude oil (3).

Petroleum Classified into Three Categories (6):

1. Oil Paraffinic: Paraffin waxes that contain trace amounts of asphalt materials.
3. Crude Oil Mixed: This kind of crude oil has paraffin materials and asphalt materials.

The Physical Properties of Petroleum

1. Specific weight (relative) or American petroleum institute (API): The specific weight and density are the most important properties used when studying petroleum and petroleum products. However, these two properties are particularly important when calculating the weight and mass of petroleum products in cases in which they are appointed (8). The volume of these products is by direct measurement and the API starts from 10 to 50 API degrees with other kinds of petroleum being API between 10-45. (8).
2. Viscosity: The resistance of the liquid when removing one of the layers for another layer under the influence of an external force. It is discriminated between the dynamic viscosity and the relative (8).
3. Molecular Weight: Molecular weight depends on the petroleum molecular weight of the compounds involved and the ratio between them. It often ranges of ore from 250 to 300. And increasing the molecular weight of the oil raises the boiling point (8).

Figure 1: Chemical structure of crude oil (6)
The Structure of the Oil Well

The Wellhead

The wellhead is a set of valves designed to withstand high pressures. The first production pipe (the main valve (which has two valves)) and secondly, the second production pipe (the secondary valve (which also has two valves)) are two connected pipes extending from the well. These pipes later meet to form a single pipe production - and are Y-shaped (Y-PIECE). This single pipe contains the choke size valve, which controls the productivity of the well; this is followed by the safety valve. The primary purpose of this valve is to control the flow of the well and to discourage the occurrence of any damage to the line in the carrier oil from the well to the station. The safety valve has three secondary valves: upper, lower, and drain. This is then followed by the gate valve (7).

![Image of Oil Well, Nasiriyah Degassing Station]

**Figure 2:** Oil Well, Nasiriyah Degassing Station

The Process of Opening the Well (7)

1. First make sure of the validity of all the parts associated with the head of the well and verify the flow tube.
2. Determine the size of the slot (chock size valve).
3. One of the main valves is opened for production (either the first or secondary production pipe)
4. Gradually open the secondary valve to even out the pressure of the gas stop.
5. The safety valve is opened when the pressure elevates to a higher level than the operating pressure of the station insulation process. The valve is to be open as follows:
   a. Secondary (upper and lower) valves of the safety valve must be closed.
   b. Open the drain valve to empty the remaining gas, then close it
   c. Open the safety valve.
   d. Open the lower safety valve gradually until the safety valve is completely open.
6. Gradually open the gate valve located on the tube production.
7. Repeat steps 3-6 for other wells (3 and 4).
8. The well is monitored for the purpose of ascertaining the validity of his work.
The Process of Closing the Well (7)

1. Close the main valve of one of the two tube productions. Then close the secondary valve.
2. Close the main valves of the other tube production. Then close the secondary valve.
3. Close the safety valve:
   a. Close the upper valve within the safety valve.
   b. Close the lower valve within the safety valve.
   c. Open the drain valve. The safety valve will automatically close. Then close the drain valve.

NOTE: Do not close the main valve. If the well has been closed for a considerable amount of time, or in the case of a need for maintenance and/or reclamation, or any other process that requires a lock for the purpose of preserving it from damage, use the secondary valve and keep the main valve open.

Figure 3: Safety Valve, Nasiriyah Degassing Station

Manifold

The manifold is a collection of pipes and valves through which the amount of oil coming through the oil well is controlled. Oil is distributed to the insulators according to several variables - the most important of which is the capacity of the separator or energy production (bbl/day). Another vital variable is the production of each well of oil - and gas should not load separator capacity of more than operational (7).
The number of separators differs from field to field - and that number depends on the amount of gases and water which are associated with crude oil. Large amounts of gas and water have a significant amount of separators. In this study, the Nasiriyah Degassing Station will be used as an example (7).

The Ideal Separator

The ideal separator is cylindrical or spherical in shape (and either vertical or horizontal) and it is divided in terms of the phase to two-phase or three-phase insulators. Insulators can be used for both horizontal and vertical purposes. The separator containing the inside beams and barriers strung from which to provide a larger surface area is spread by the crude oil inside to the top of the separator - and thus a bigger possible quantity of gas is liberated from crude oil. A simple separator consists of the following parts (7):

1. Located at the top of the separator is the inlet oil and located at the bottom of the separator is the exit oil.
2. Also located near the top of the separator is the Gas Exit Slot.
3. Exit hole and water discharge slot.
4. Contain separator and safety valves that are located at the top of the separator, This works on a gas discharge when it exceeds the pressure, due to the separator.
5. Provide insulation standards of pressure, level, temperature, and dominants.
6. Provide insulation level control valves and pressure control valves, as well as other types of valves of different use.
7. Contain separator slots maintenance and protective barriers.
8. Provide insulating pipes of different diameters both depending on their use.
Nasiriyah Degassing Station

The Nasiriyah Degassing Station consists of four stages (separators). The first stage is composed of two separators (one for standby). They are all horizontal (and cylindrical) in shape. Similar to other degassing stations elsewhere, there are many types of insulators - including vertical, horizontal, and spherical.

The oil enters from the top of the separator. The oil encounters bumpers as it progresses - these bumpers encourage the separating process. The bumpers also prevent the flow of oil from foaming. After the separation, the gas is naturally lifted and separated toward the top. Here it exits from the gas stream through a mesh located (near the start) within the pipe - while the oil moves downward due to the higher density. The oil remains at the bottom of the separator and exits from a pipe to the next stage. The function of the mesh is to strain the oil from the gas and prevent it from leaving - to ensure the exiting gas is free of oil (7).

![Figure 5: Petroleum Separators, Nasiriyah Degassing Station](image)

Types of Insulators and Insulation Specifications

The first separator is a Canadian-made insulation and it is operational at 28Kg/cm² (roughly). This stage is vital since at this station, the majority of gases are separated (7).
The second separator is a US-made insulation and it is operational 7Kg/cm\(^2\) (roughly). This separator receives oil from the first separator where it then moves on to the third separator (7).

The third separator is a US-made insulation and it is operational 1.8 Kg/cm\(^2\) (roughly). At this time, the separation process releases a large amount of gases. It then moves on to the fourth stage (7).
The fourth and final separator is a US-made insulation and it is operational 0.4Kg/cm$^2$ (roughly). At this point, the separation process is complete. It then moves it to the oil storage tank. (7).

Pressures above the operational pressure are the most appropriate and efficient. Put the fourth separator at a convenient height to ensure the smooth flow of oil around the tank. From each insulation stream, gas goes to the flare. We have four flares for each stage of insulation - as well as the containing of all separator valves associated with the security of the cold flare. The purpose of this is so that the discharge pressure, once it goes beyond the operational pressure’s established limit for each isolation phase, the safety valves will open. After the pressure reaches operational (and further recedes) the safety valves will automatically close (7).

**Contents of each Separator:**

- Slot Entry Product (inlet production) - located at the top of the separator.
- Oil Exit Slot - located at the bottom of the separator.
- Gas Exit Slot - located at the top of the separator.
- Exit Water Slot - located at the bottom of the separator.
• Discharge (Drain) Slot - located at the bottom of the separator.
• Two Safety Valves - located at the top of the separators. They are connected to a pipe which in turn connects to the flare.
• Pressure Gauge.
• A measure of the level.
• Temperature gauge and dominants.

Maintenance and protective barriers containing separator slots (3 and 6).

Features of the Horizontal Separator:
• More economical than the vertical insulators.
• Easy Installation.
• The possibility of transfer.
• Small diameter.
• The possibility of linking more than insulation (7 and 8).

Types of Separators and Insulators

Insulators can be divided in terms of shape - vertical and horizontal. Vertical separators are used in high pressure stations and vertical insulators are used for high flow rates. Vertical separators use structure duplex to change the track of the flow rate and they achieve a larger amount of insulation between the gas and the liquid (5). Horizontal separators are used in the low pressure stations. Horizontal insulators are used for high flow rates. It also contains the larger interfacial areas for the separation between oil and gas - this will be the largest possible area for the separation of oil and gas. It will be of a higher quality (5). Insulators can be divided in terms of the number of phases (1) - two-phase separators and three-phase separators.

Vapor Demisting

Vapor demisting is used to extract the oil droplets which are carried along with the gas. Vapor demisting is achieved through the use of wire mesh - however, when the oil processor is heavy or contains waxy crude, replace this network by Serpentine Vanes and set up all these types perpendicular to the direction of the flow, this way, the gas flow is now winding which
helps the process of separating the drops (5).

Liquid Residence Time

The liquid residence time is frequently used in the three-phase insulators in order for the water and the oil to be separated from each other according to the difference in density. Many of the structures used to isolate these two liquids from each other (and the size of these structures) depend on the time of residence of the fluid in the separator. Residence times can be affected by many factors - such as: specific gravity, operating temperature, and the percentage of water in the oil outside (5).

Crude Oil Treatment Process

Contain the oil coming from the wells according to the type of reservoir, the product of it (in terms of being low or high pressure), and the type of well (in terms of the type of reservoir) - as well as the method of production from the well (raise natural - raise industrial), and the isolation of natural gas from crude oil, are the main objectives of the stations insulation. So it is necessary to know what is happening inside the separator to better understand the overall process. To understand the process of insulation, one must be aware of the following details:

- The crude oil coming from the wells has a high pressure. If, inside, it reaches the station insulation pressure of PSI 170, for example, it will drop in pressure and arrive at the separator with a pressure of 60 PSI. Due to the pressure, the gas will separate from the oil since the gas was dissolved in the oil. When the liquid itself quickly drops in pressure, the gas will dissolve. I will elaborate the process by the use of a sample example:
  - When a soft drink is opened it issues a strong sound accompanied by the exit of the gas - what does that mean? The gas was (under pressure) dissolved in the liquid (soft drink) and when we opened soft drink, it has a drop in pressure which leads to the releasing of gases. This is precisely what happens with the natural gas dissolved in oil at the entry of the separator.
- Secondly, which helps to isolate the gas from the oil, there is a density difference between oil and gas - oil is heavier than gas, which leads to the liberation of gas towards the top and the descent of the oil to the bottom. The internal mechanical design of the separator plays a major role in the process of separation. Additionally the large surface area of the separator, compared to a piped oil tanker, helps the process of isolation to separate the crude oil from the water and the gases (3 and 5).

Separator Efficiency

The separator efficiency is a measure of the amount of gas insulated relative to the total amount of gas in the oil inside. This value cannot be found in a laboratory, but rather it must be calculated on site or at the petroleum field - and this ratio depends on the overall GOR oil inside the separator, the fluid velocity, and the type of flow (1).

Separator Safety Valves

The main purpose of these valves is to prevent the effects of excess high pressure on the equipment. To prevent the excess high pressure, one must work this valve to drain the excess volume upon the arrival of the pressure to a predetermined degree (thus reducing the pressure in a safe manner). The primary use of the safety valves is to prevent damage to equipment due to the high pressure. High pressure can be caused by the following occurrences: (1) an
irregular flow of liquid caused by irregularly closed or opened valves, (2) a malfunction in the cooling system - which leads to an expansion of the liquid or gas, (3) fluctuations in pressure, (4) exposure of lab facility to burn, (5) the reactions emitting heat cannot be controlled (Exothermic Reactions), and (6) fluctuations in temperature. (Note that this valve has a multitude of names (Pressure Relief Valve, Safety Valve, Relief Valve, and Safety Relief Valve (7)). After the completion of the process of isolating the gas from the crude oil, it goes to the reservoirs for the purpose of storage and pumping.

**Safety Valves (Level and Pressure Control) within the Separator**

The level control valve works through signaled air arriving from the Sent which is installed at the top of the separator. A float is opened which determines the amount of air that reaches the valve. This valve opens the float to increase the amount of air that it had received from the sending and closing that decreases the air valve to control the specific level of oil inside the separator (7).

The pressure control valve is similar to the installation of the first valve - with a difference. It opening decreases the amount of air and closing increases the amount of arriving air. We can install this valve on a specific slot to get the desired pressure of the separator (7).

![Level Control Valve, Nasiriayah Degassing Station](image1.png)

![Pressure Control Valve, Nasiriayah Degassing Station](image2.png)

**Flare system**

(System Burners)

There are two kinds of flares in the petroleum separation system. The first of which is the cold torch. Bollards or the pipes are related to the discharge pipe of insulators (which are pipes that are joined between the insulators and the associated valves and piping with the safety of each separator) (7). The second variety of flare is the hot torch. This is the burning gas produced from each stage of the insulation at the station where there is a candle burning for each stage of its own. There is also a candle burning for each common stage to convert them in the event of damage or to perform maintenance work on one of the bollards.

There is another flare related to the storage tanks. The function of this flare is the discharge of the remaining gases in crude oil after the separation - as we know the separation
process is not always perfect nor ideal (i.e. there is a small amount of gas that is still not separated from the crude oil). This flare helps the gases to release from the crude oil storage tank. Each tube out of the gas tank has a cold flare that burns any remaining gases (there is also an additional preventive blocker, located within the pipe that connects the cold flare and the tank (it stops the fire from reaching the tank)) (7).

Figure 14: Cold Flare, Nasiriyah Degassing Station

Figure 15: Pipes of the Hot Flare, Nasiriyah Degassing Station

Figure 16: Hot Flare, Nasiriyah Degassing Station

Distillate System

When the gas goes out from the separator, after production insulators and separated from the oil, it passes through the system to separate the distillate oil droplets from the gases passing through a tube going to the flares. This consists of a system of several insulators. The gases (with a small amount of remaining oil) pass through these insulators, and, in turn, are discharged into reservoirs. After closing the oil entry valve and the exit gas valve, next open the exit oil valve. (7).
There are two types of oil tanks. The first is the Tank Inspection (TEST). This is used to store oil while conducting a screening process for the wells. The purpose of this screening process is to measure the amount of oil production. For example, in Nasiriyah Degassing Station there is a test tank-size of 700 m$^3$ (figure 11).

**Specifications of this Tank**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of entry oil pipeline for this reservoir:</td>
<td>16 inches</td>
</tr>
<tr>
<td>Diameter of exit oil pipeline:</td>
<td>10 inches</td>
</tr>
<tr>
<td>Diameter of oil recycling tube within the tank:</td>
<td>12 inches</td>
</tr>
<tr>
<td>Diameter of the oil stirring pipeline within the tank:</td>
<td>8 inches</td>
</tr>
<tr>
<td>Diameter of gas discharge tube:</td>
<td>16 inches</td>
</tr>
<tr>
<td>Diameter of drainpipe:</td>
<td>8 inches</td>
</tr>
</tbody>
</table>
Properties of this Tank

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter:</td>
<td>10.43 m</td>
</tr>
<tr>
<td>Capacity:</td>
<td>700 m³</td>
</tr>
<tr>
<td>Design Pressure:</td>
<td>200 mm. w</td>
</tr>
<tr>
<td>Height:</td>
<td>8.94 m</td>
</tr>
<tr>
<td>Design Liquid Level:</td>
<td>8 m</td>
</tr>
<tr>
<td>Maximum Operation Temperature:</td>
<td>87 °C</td>
</tr>
</tbody>
</table>

The second tank is the tank of crude oil production. This tank is used for the storage of crude oil after it has been separated by insulators. There are a multitude of intricate components for this tank (7):

- Crude oil pipeline entry and exit tube.
- Oil drainpipe.
- Safety valve located at the top of the tank.
- Measurement slot at the top of the tank.
- Exit gas tube (to the torch).
- Network extinguishing and cooling.
- Stairs and barriers.
- Maintenance slots.
- Measures of temperature, pressure, and other sensors.
- A tube of water surrounds the top of the tank for the purpose of cooling and amortization.

Figure 18: Oil Test Tank, Nasiriyah Degassing Station
• Tube stirring or recycling.

**Tank Safety Requirements**

The following list of criteria should be followed to ensure the overall safety of personnel and of the materials:

1. Ensure that only authorized personnel raise tanks.
2. Periodically check and validate valves to determine if they are in working condition.
3. The necessary presence of ladders and protective railings to prevent falling.
4. Wearing masks when measuring the level of oil.
5. The tube to the outside torches provides the inhibitor Fire Back.
6. Electrical inhibitor spark connections on the tanks
7. The periodic inspection of the tanks in terms of measuring thickness and get rid of erosions in the tank and maintenance procedures (7).

![Figure 19: Tank Oil, Nasiriyah Degassing Station](image)

**Operational Problems in the Isolation of Crude Oil**

The modern development of new designs for gas separators has helped to reduce previous operational problems. The majority of the operational problems at this time have been caused by issues such as: carryover, gas pockets, safety valve opening in the separator (without the presence of high oil), replacement LED, closing of the valves in the fourth stage, closing the valve that controls the oil without external influences, and the opening of the valve controlling the gas PCV (without external influences).

Carryover, an operational issue with the separation of crude oil, is the most prominent of operational complications. The exit of the mixture of oil and gas (of a large quantity) will pass to the flare, which will be in the form of black smoke. If personnel is unaware of or not paying attention to the controls in the separators, a large amount of oil will be burned through the torch and potentially lead to a fire (7).

A carryover can occur due to the following reasons: (1) the separator is filled to more than operational capacity through the poor organization of complex valves, (2) the exit oil valve if closed or damaged (or lack of drainage in the unit receiving the oil), (3) damage in the LED dominating level, which leads to a high level of oil in the separator, and (4) a defect in the regulating valve or pressure reducing valve, inadvertently leading to a low pressure separator - thus the rise of the level of oil. The first reason for a carryover is handled through
the organization of complex valves as well as regulating the amount of oil entering each separator. In the second case, one must repair or replace the valve oil. In both cases, the third and fourth cause, the separator must stop until the control valves are repaired or collaborated (7).

Another operational issue is the presence of gas pockets. Gas pockets generate pockets of gas in the line of carrier oil to the unit receiving the oil, especially if the pipes carrying the oil from insulation stations to storage tanks located a far distance from the separators, which can negatively affect the work of the insulation. It can also cause high pressure and the inability to control the pressure valve since these pockets of gas are more like a partially closed valve which leads to a pressure opposite (7).

Gas pockets occur due to the following reasons - the low level of oil inside the separator (due to damage in the controlled level or an unintentional change) (7) and high pressure in the separator due to an irregular crude oil flow. In both cases, the station must temporarily shut down while gas pockets drain from the line carrier oil through the vent at multiple points. It should be located at the line and then a processing or calibration or replacement of the damaged valves (7).

If the safety valve opens in the separator without the presence of high oil, this too causes an issue. The reason is that it damages the LED dominating pressure and the safety valve (5). It can be treated by the replacement of the LED valve after diagnosis (5). Overly high pressure in the tank (5) caused by a low level in the third and fourth stage, high pressure in the fourth stage, and/or a blockage in the exit gas tube tank. This must be treated as a case by case - or the with an evaluation of the reason leading to the high pressure.

Additional complications can result from the closing of valves in the fourth stage in the separation system. The reason this causes a complication is because the high pressure tank (more than (7.5)) (5). To solve this issue, it is best to open the valves. Further problems can arise when the valve controlling the oil is closed without external influences - this in turn creates a failure to equip the air, thus valves are to be used until the completion of the defect (5). And finally, if the valve controlling the gas PCV is opened without external influences, a failure to equip the air occurs. Therefore, valves are to be used until the completion of the defect.

Pumps

There are a variety of pumps used in pumping crude oil. Each pump is different in terms of the design as well as the driving force for the oil (5). The first pump is the poster - this pump is working to raise the pressure of the crude oil coming from the tanks to the pressure level (7-15kg/cm²) (roughly). The main pump comes after the poster. The pressure should be more than (8kg/cm²) (that is why the poster pump comes before it). The main pump pumps the crude oil from the poster to the carrier oil line and from there it then goes to the oil export ports (7).

Poster Pump Specifications (7):

<table>
<thead>
<tr>
<th>Type</th>
<th>MMA1280D</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLT</td>
<td>380</td>
</tr>
<tr>
<td>HZ</td>
<td>50</td>
</tr>
<tr>
<td>ROM</td>
<td>2975</td>
</tr>
</tbody>
</table>
**Figure 20:** Poster, Nasiriyah Degassing Station

**Main Pump Specifications:**

<table>
<thead>
<tr>
<th>Type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLT</td>
<td>380 V</td>
</tr>
<tr>
<td>HZ</td>
<td>50</td>
</tr>
<tr>
<td>ROM</td>
<td>2975 r/min</td>
</tr>
<tr>
<td>Weight</td>
<td>950 Kg</td>
</tr>
</tbody>
</table>

**Figure 21:** Main Pump, Nasiriyah Degassing Station
Variety of Valves used in the Separation System

A vital piece of the station is the crush valve. The crush valve is used to directly shut down the station without returning to the valves of oil wells in emergency situations. (Emergencies such as sudden high pressure in a separator, when the safety valve is unable to discharge the pressure, and/or high pressure in the tank production as it reaches the signal directly from the tank valve to the crush valve (4 and 8). Additionally there is the check valve. This valve works to prevent the return of oil or gas. There are different sizes of this valve according to the type of operation (4 and 8). There are other varieties of valves that are used, such as gate valves and mechanical spherical valves.

Figure 22: Crush Valve, Nasiriyah Degassing Station

Figure 23: Check Valve, Nasiriyah Degassing Station

Figure 24: Irreversible Gate Valves, Nasiriyah Degassing Station

Figure 25: Irreversible Gate Valves, Nasiriyah Degassing Station
Conclusion

This study is encouraged to be used as a manual for chemical engineering personnel and students alike. This study provides its readers with substantial information regarding the overall separation of crude oil in the petroleum system - as well as presenting and discussing the necessary equipment involved in the process (such as the separators, various valves (safety valve, crush valve, check valves, etc.), pumps (poster pump, main pump), and specifications of the oil tanks. This study also offers forth discourse on the standard complications and malfunctions frequently seen of the separation process as well as any standard issues with equipment. Examples of operating complications are offered alongside explanations for why they may occur, how they can be avoided, and possible treatment options. Complications such as carryover, gas pockets, the safety valve opening in the separator (without the presence of high oil), etc. are discussed in detail. Thus this study provides safety precautions and how best to handle and prevent dangerous and potentially situations while operating the process.

The aspect of my own personal involvement and research for two years as a personnel member at the South Oil Company substantiates this analysis. I have established an open and useful description of the entire process of crude oil separation - from the initial steps of extraction from the ground to the additional and remaining processes of separating the oil from the gases, water, and other numerous chemicals as well as the storage process. If used properly, this study will provide its readers with vital and detailed information and analysis of the equipment as well as the process itself - and finally, how to establish a process for enabling the best procedure for the separation of oil with a high efficiency.

References

(7) Nasiriyah Degassing Station: http://www.nasiriyah.org/ara/oil/home
Moral Disagreement and Audi’s Account of Moral Intuitionism

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In *Moral Perception* Robert Audi lays out an intuitionist account of moral perception where a moral agent of the proper disposition can use emotion and intuition as a means of supporting or justifying knowledge concerning certain moral truths or propositions. This, however, opens Audi’s account up to possible cases of moral disagreement, since emotion and intuition can vary from agent to agent regarding some particular moral propositions and, furthermore, neither agent would be better disposed to claim priority for his (justifying) emotion or intuition over that of the other agent. For this reason, I argue that agents in this intuitionist picture ought to remain epistemically agnostic towards any moral proposition that they and a relevant epistemic/moral peer actually disagree upon.

Section I: Emotion and Intuition as Justification of Moral Judgment

To begin, Audi claims that intuition and emotion can be a major factor in justifying claims regarding the truth of moral propositions. Ultimately, the process involves intuition and emotion leading us to make justified moral judgments.

Nesting justification in something like judgment, instead of merely belief, is very important for Audi’s account. While both belief and judgment can cause an agent to be motivated to act, judgment is taken to be a better form of motivation for actions on Audi’s account. Audi also considers judgment to be capable of bringing our beliefs into “sharper focus”, presumably because judgment is typically considered to be a conscious inferential process which could make more salient the fact that an agent believes p. Lastly, judgment can and typically does include reflection, another means of bringing our beliefs into “sharper focus”. For these reasons moral judgment, which typically entails belief formation one way or the other regarding the object of the judgment, is taken to be a central component of justification on this account.

It is evident on Audi’s account that emotion and intuition are supposed to provide justification by going through this process of judgment and reflection, with the agent ultimately coming to judge the proposition in question as being either true or false. It is, however, much more difficult to see exactly how this is supposed to be accomplished. To be sure, there is no set way in which intuition and emotion justify moral judgment. Instead, there is a sort of general process by which intuition and emotion do so. I will attempt a brief sketch of this process below.

To start, we have some intuition or emotion regarding some moral proposition and its truth value. In some instances we may not feel as certain regarding some intuitions and emotions as we would others and because of this we refrain from making a decision one way or the other regarding that proposition. Instead, we reflect on the truth value of that proposition in order to come to some resolution of the matter. As Audi notes, reflection can provide adequate resolution, “…by evoking supporting or opposing intuitions, by leading us to a theoretical analysis, by providing premises that confirm or disconfirm the initial intuition, or in other ways.”

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Section II: The Problem of Disagreement

Even if we accept Audi’s account at face value we are still presented with the problem of disagreement. The problem is this: if emotion and intuition are means of coming to moral knowledge and, furthermore, emotion and intuition are taken to provide justification for the judgments we make, then how are we supposed to understand disagreement about (justified) moral judgments? Presumably, on an objectivist account such as Audi’s, there will be a fact of the matter as to whether it is true or false that moral proposition p holds, but in what way are we justified in claiming that we know p if the basis for that justification is, in part, constitutive of the moral judgments we disagree upon? To be clear there are, of course, different kinds of disagreement we ought to consider.

The relevant kind of disagreement for this discussion is content-specific disagreement. Content-specific disagreement concerns disagreement regarding the content of a given proposition. Furthermore, content-specific disagreement can be categorized in the following way: as propositional or attributive disagreement. Propositional disagreement is a very common kind of disagreement characterized by at least two agents holding contrary views on a given proposition. For instance, I hold that p and my colleague holds that not p. Attributive disagreement, on the other hand, is characterized by at least two agents holding contrary views on any given proposition because they have attributed or predicated different qualities to the thing in question. There are additional kinds of disagreement, but for the purpose of this paper we will only be concerned with propositional disagreement.

There is also the issue of the relevant epistemic peer necessary for the sort of disagreement I am talking about to be a problem. If two individuals disagree, this by itself may not be enough for the disagreement to cause any real problem, since it could be the case that the two individuals disagreeing are not peers in the relevant sense. An example of this is when a child and the child’s grandparent disagree regarding some moral proposition. The child’s disagreement should not be enough to raise suspicion in the grandparent about his intuition regarding the moral proposition in question. For our purposes epistemic peers must at least be “…(a) equally rational and equally thoughtful and (b) have considered the same relevant evidence equally conscientiously.” This is generally called epistemic parity. In situations where we have epistemic parity and disagreement persists despite equally conscientious consideration of the other agent’s position we have instances of problematic disagreement.

Section III: Audi’s Solution to Propositional Disagreement

One possible solution Audi proposes is that we solve moral propositional disagreement through recourse to our moral perceptions. According to Audi “…moral perceptions, are responsive to the properties that determine moral truths, and moral emotions and often reflect such truths.” Surely this seems fine, but we are left with an issue even if we accept that moral perceptions sometimes latch on to moral truths.

Suppose two agents disagree on the truth value of a given proposition and attempt to solve the disagreement through moral perception. Moral perception on Audi’s account is not similar to non-moral perception, in that moral perception concerns what Audi calls perceptible properties instead of perceptual properties. Perceptible properties are not all sensory and can be normative, while perceptual properties are all sensory and non-normative. Since perceptible properties are not all sensory this leaves open the possibility that some of them are sensory, but Audi does not seem to take this approach. Here is an example of how Audi speaks about perceiving injustice:

One might think that the phenomenal elements in perception properly so called must be sensory in the representational way that characterizes paradigms of seeing and some of
the other four ordinary senses. But why should we expect perception of injustice, which is a normative, non-sensory phenomenon, to be just like perception of color, shape, flavor, or sound, which are physical or in any case sensory and non-normative?\textsuperscript{lxii}

So, perception of a moral property is not properly sensory. Since this is the case disputants have nothing sensory to point to during a disagreement. On Audi’s account we can have moral knowledge, but it seems much more difficult (nigh impossible) to provide proper justification for such claims when confronted with the relevant disagreement. Assuming the dispute is between genuine epistemic peers, appeal to perception will bring the disputants no closer to reaching an agreement, but instead pushes the issue back from moral judgments, to moral intuitions or emotions, further back to moral perceptions.

Another approach that Audi hints at is an appeal to moral expertise. In the final sections of his work \textit{Moral Perception} Audi mentions that ethical theory and aesthetics are analogous in many ways. One of the ways in which ethical theory and aesthetics are analogous, Audi contends, lies in the conditions necessary to come to well-founded judgments. As criteria for the well-foundedness of judgments Audi invokes Hume’s ideal aesthetic judge. The famous passage from \textit{Of the Standard of Taste} explicates certain features:

\[S\]trong sense, united to delicate sentiment, improved by practice, perfected by comparison, and cleared of all prejudice, [which] can alone entitle critics to this valuable character; and the joint verdict of such, wherever they are found, is the true standard of taste and beauty.\textsuperscript{lxiii}

I think that this approach fails for the same reasons an appeal to perception fails to adjudicate disagreement. Suppose that two ethical judges disagree on the truth value of a given moral proposition. What recourse would these two have to solve their disagreement? Pointing to experience in comparison, intuitions, or emotions, which originally justified the judgment of the ethical judge, are all properly non-sensory and provide no way to properly adjudicate the matter if disagreement persists.

\textbf{Section IV: Epistemic Agnosticism and Possible Problems}

In Sarah McGrath’s piece “Moral Disagreement and Moral Expertise” she mentions a passage from Henry Sidgwick’s \textit{The Methods of Ethics}, which goes as follows:

\[I\]f I find any of my judgments, intuitive or inferential, in direct conflict with a judgment of some other mind, there must be error somewhere: and if I have no more reason to suspect error in the other mind than in my own, reflective comparison between the two judgments necessarily reduces me temporarily to a state of neutrality.\textsuperscript{lxiv}

McGrath calls a belief that satisfies Sidgwick’s condition \textit{CONTROVERSIAL}.\textsuperscript{lxv} To be sure a \textit{CONTROVERSIAL} belief involves two relevantly disposed agents engaging in (propositional) disagreement, such that if either agent has good reason to think the other is an epistemic or moral peer, then both suspend judgment. If the agents in question are not actually peers then a disputed belief is not \textit{CONTROVERSIAL}. Recall the example I mentioned earlier of the child and the grandparent disagreeing regarding some moral proposition. This is an example of a disputed moral belief or judgment, but not a \textit{CONTROVERSIAL} belief or judgment.

The judgments that are subject to propositional disagreement which I have been discussing are the ones which I believe suffer from being \textit{CONTROVERSIAL} judgments. Furthermore, I think that if a judgment (or belief) is \textit{CONTROVERSIAL} in this sense, then these judgments cannot amount to knowledge because one of the aspects of being a \textit{CONTROVERSIAL} judgment, in my view, is that \textit{CONTROVERSIAL} judgments do not provide justification for a belief simply because we have no good reason to place more credence on
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our own intuitions than another agent’s intuitions, given that the relevant kind of disagreement actually crops up.\textsuperscript{lxvi}

I think it is important to note that there are objections to this skeptical position regarding disagreement. I will canvas a few of them here. First, some philosophers question how this notion of epistemic agnosticism translates into areas other than morality. For instance, Russ Shafer-Landau argues that taking this position calls into question all of our beliefs or judgments regarding philosophical positions and factual claims as foundational as “There exists an external world.” since, as Shafer-Landau interprets the skeptic, all it takes is one agent who vehemently disagrees with any other agent, which would then give the first agent grounds to claim that we should be epistemically agnostic towards whatever position is disagreed upon and remain so until disagreement is resolved.\textsuperscript{lxvii} Although this consequence seems appropriate considering the skeptic’s charge, I am more inclined to think otherwise. As McGrath notes, with “…a more charitable construal of ... [the skeptic’s] challenge, it is the fact that there is a substantial division of opinion with respect to controversial moral questions that undermines the possibility of knowing the answers to those questions.”\textsuperscript{lxviii} So, it need not be the case that skepticism in the moral realm translates into any other realm, philosophical or otherwise, but this position need not preclude such skepticism either.\textsuperscript{lxix}

Second, Catherine Elgin maintains that we cannot voluntarily withhold (or make, for that matter) a given belief, since the act of forming a belief is not a voluntary one. Furthermore, Elgin accepts the notion that stating an agent ought to $\phi$ implies that that agent can in fact $\phi$. If both of these premises are true, then this seems to be the strongest case against epistemic agnosticism or moderation, as Elgin calls it, since if it is the case that one cannot voluntarily form a belief or refrain from doing so, then it does not follow that one ought to.\textsuperscript{lxx}

Although this is the case it is far from clear as to whether or not one is precluded from remaining indifferent regarding any specific judgment or belief. Furthermore, Elgin’s solution to the problem is to push the argument back to acceptance of a given proposition, which is voluntary, instead of belief in a given proposition, which she holds to be involuntary.

Elgin maintains that this position has general beneficial effects for the epistemology of disagreement literature, which includes a means of distinguishing between doxastic rationality and practical rationality. With regards to the problem I am attempting to address however, I think that one could merely accept Elgin’s new dichotomy of acceptance as voluntary and belief as involuntary and build this into one’s epistemic policy without significant problems.

The last objection I will mention to the sort of Sidgwickian epistemic agnosticism I am advocating for is an internalist Bayesian approach developed by Ralph Wedgwood. Wedgwood holds that, “...it is rational to have a “special sort” of trust in one’s own intuitions, but it is not even possible to have the same sort of “trust” in the intuitions of others.”\textsuperscript{lxxi} This claim rests on the idea that our own intuitions can guide us to belief formation, but the intuitions of others cannot have an exactly similar doxastic effect on us. If this is true, then it does not necessarily follow that in every case of disagreement we need to suspend judgment on the proposition we are disagreeing upon, but some of the time suspension of judgment is the rational thing to do. So far, this sounds consistent with the sort of epistemic agnosticism I am proposing. On my account you are not required to suspend judgment in every case of disagreement, but only in those cases where an actual epistemic peer is disagreeing with you. In this sense, Wedgwood’s position seems to be congruent with mine.

What is markedly different about Wedgwood’s account is that what it is rational to do is determined by our stock of conditional beliefs as well as some general epistemic principle, such as Jeffrey conditionalizing. Wedgwood argues that it is the case that agents can respond in a number of ways to disagreement. What is not clear from Wedgwood’s argument is that either of the disputants are epistemic peers in any of the cases where the agents in question do
anything but suspend judgment. More work will need to be done on what constitutes a relevant epistemic peer, what doxastic effect another agent’s belief has on us, and how background conditional beliefs play a role in belief formation.

Conclusion

I have argued that Audi’s intuitionist account of moral perception is faced with a problem when the relevant epistemic peers engage in disagreement. First, I gave a brief sketch of Audi’s position, including how intuition and emotion play a justificatory role in moral judgments.

Then I raised the issue of disagreement and provided a brief sketch of a possible solution. The solution I attempt to provide is Sidgwickian in nature, arguing that when presented with the relevant kind of disagreement both agents’ ought to suspend judgment on the proposition in question. Lastly, I mentioned three objections to the sort of epistemic agnosticism I am proposing, none of which I consider to be fatal to this epistemic account.

References


Audi, Robert. *Moral Perception*. Princeton: Princeton University Press, 2013. Print. It may be important to note that this position assumes the existence of objective moral properties as a starting point and, as such, I will be assuming from the outset of this paper that moral properties do in fact exist in this manner.

IVII Ibid, pp. 161-162

IVIII Ibid, p. 165

IVIX Ibid, p. 76

IVX Ibid, p. 168

IVXI Ibid, pp. 36-37 [My italics]


As I understand it this position is either very similar to or has already been enunciated by Alan Gibbard in *Wise Choices, Apt Feeling* (pp. 176 – 181).


McGrath, “Moral Disagreement and Moral Expertise”. (p. 95)

In fact, I am inclined to side with Shafer-Landau regarding his claim that taking this sort of skeptical position should incline one to regard philosophical positions in general in the same manner, but this concession ought not to affect my current argument.


Autumn on the Kal-Haven Trail

Winner of Artwork Award, Winter 2014

By Charles Lein
Medieval Institute
charles.g.lein@wmich.edu
Road Toward Success

By Muthanna Yaqoob
Department of Geosciences
muthanna.y.yaqoub@wmich.edu
The Four Seasons

Winner of Best Creative Writing, Winter 2014

By Luke Chambers
Medieval Institute
luke.j.chambers@wmich.edu

A poet in the spring walked from the east
across the grassy field from which a hill
arose, tall and alone in all the plane.
And on its crest a tree reached higher still.
The poet’s breath caught tight within his breast,
for as he saw this tree, as rosy dawn
unloosed her rising rays of gold on high,
then, in that glow, its apple blossoms shown
from laden boughs with dappling rosy white,
aflutter in the wind like burning flames.
And as the growing dawn flowed down the hill,
the dewy grass alighting as she came,
the poet, moved by love of morning young,
sat to compose a verse as yet unsung.

In summer came a poet from the south
across the grassy field up towards a hill
that beautiful and green shown in the sunlight;
on its crest a tree shown greener still.
The poet marveled at the spreading tree
whose branches hung down low bent by their load,
green-golden apples hid beneath its leaves;
those blushing pink on whom the sunlight shown.
Song birds nested high up in its boughs
where squirrels chased each other in their play.
White and yellow daisies swayed around
the rabbits munching clover in its shade.
Then, moved by love of nature in her prime,
the poet paused to write a verse in rhyme.

Out of the west a poet walked in fall
across the windy field, a hill in sight
whence on the breeze blew tufts of seedy down
around a tree that he’d reach if he might.
Still on the plane, he paused to look above
and saw through thinning leaves the tree was bowed
down by its apples glistening ruby-red,
low swaying, slowly reaching for the ground.
The poet reached the hill’s broad base and paused:
there in the grass once green, now gone to seed,
an apple, ripe and ready, lay by chance.
He took it, bit it, sucked its juices sweet.
The poet, for the joy of life attained,
reworked a weighty theme fresh as the rain.

Winter, and a northern poet came
across the frozen field up to a hill.
Its northern face a mass of snow and shade.
Against the sky a tree stood tall and still.
The gloaming twilight was upon the land
And so the poet climbed up through the snow
until he stood atop the hill and watched
the failing of the southern sun’s last glow.
The poet sat against the tree’s thick trunk
where snow had mounded, blown on either side,
and wondered at the barren boughs above
through which the kindling stars he could descry.
And then, moved by the beauty of the sight,
the poet made a sonnet for the night.
Swerve

By Eric Mishne
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Jerica is my carpool buddy. Well, she’s the woman I give a ride to work. She never drives. Twenty minutes. One way. Five days a week. I listen to Jerica talk about her dogs, and her games. Her and her husband have three big dogs – I’m not even sure what kind, she probably told me once but I never bothered to remember – and they are gamers. I mean serious gamers. They spend 2-4 hours every night doing online games – WoW and the like – and 3 nights a week playing some RPG board game that takes 6-8 hours to play. It’s a pretty miserable existence if you ask me. But, it’s her life.

I’m a teacher. I teach English and Theatre at a private high school. I started the program. My students love me. My co-workers like me. I love my job. I like my life. There is no better feeling that finally meeting the expectations of everyone in your past – Your parents, old professors, and friends. It’s fulfilling.

Jerica works for our computer service department. She fixes computers.

I was about 5 minutes from dropping her off. The box truck coming the other direction careened across the centerline and barreled towards my little Prius. There was a wide berm, and no cars behind the truck – I could swerve to the right or the left. The choice was mine.

I once heard a couple of radio DJ’s say that most auto accident fatalities are passengers. The drivers walk away. They theorized that it was because of the driver’s instinct for self-preservation. They don’t even think about it – they just turn themselves away from the danger. That puts their passengers closer to the danger – closer to the impact. Leading to a higher chance of fatality – for the passenger. It makes sense.

In the moments after I saw the truck, and before the moment I turned the wheel, I thought about the conversation of those radio DJ’s. Instinct. Right? Instincts of self-preservation. But here – in these moments of slow-motion car and truck screeching towards each other – I have time to think about it. I have time to choose. I can swerve left causing the truck to impact my passenger side – and at that speed most likely kill Jerica. Or I can swerve right, causing the truck to impact the driver side of the car – my side – most likely killing me.

It is not often that these kinds of thoughts are able to run coherently through your mind in split seconds like this. But somehow, they do. And I have to make a choice.

Is it a choice? I mean seriously – It’s a no brainer right? Self-preservation. Of course I am going to swerve left. Why wouldn’t I? Save yourself. That’s the only option. I mean when you think about it – cost benefit wise – it’s obvious. What would be lost – if she dies in this crash?

Let’s look at this from the standpoint of societal value. What does she contribute? She plays games every spare minute of her life. She spends ridiculous amounts of money on her dogs. Just last month she told me they spent $5,000 on an operation for one of their dogs. FIVE THOUSAND DOLLARS! And she still complains about not being able to pay bills. Revolting.

At work – she is expendable. There are hundreds – no, thousands – of programmers and computer nerds out there – most of them better than her. The school would hire her replacement within the week. Nothing lost there. She is on the bottom of the totem pole. She has no societal value.
I guess her husband would miss her. On that thought I shift the scenario the other way. My wife would miss me. My wife of 7 months. We’ve barely begun our lives together, and she’d be a widow. I can’t do that to her.

Plus, I have societal value. I am a teacher. I train kids to think. Analyze. Evaluate. I train kids to explore new places. People. Ideas. They love my classes. They love me. How many students would leave school without a well-rounded education because I wasn’t there to give it to them? Sure teachers are a dime-a-dozen, but not teachers like me. I’m a damn good teacher. One of the best – I’ve been told that many times. I give back. I never ask for anything in return. I volunteer for countless organizations. I give money to charities every year. This world would be a lesser place if I die in this car accident today.

If she dies, oh well.
If I die, it would be a tragedy.
If she dies, no one would blame me.
If I die, my wife would fall apart.
If she dies, her husband would move on, eventually.
If I die, a valuable part of society will be lost.

Swerve left, or right, or left or right. It is an obvious choice. It’s a no brainer.

Left
Right.
Left.
Right
Left…
Right…
Left…
Right…….
Pools of Water: An Exposition of Traditional and American-Style Haiku

By Michael L. Albin Kiella
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Haiku is a Japanese form of poetry that traditionally contains 17 syllables, ordinarily arranged in three line-phases of 5-7-5 syllables. The intention of each haiku is to demonstrate the similarity between disparate entities, where the similarity is not completely obvious, or stand in juxtaposition. The poems are focused on nature and the natural world. The language used in each poem is concise and imagery-dense. An American form of haiku has emerged that attempts to distill the use of language to 11 syllables delivered in three line phrases of 3-5-3 syllables with brevity of articles. Alternatively, American-style haiku accepts a relaxation of the 11-syllable requirement providing that an intense imagery is formed in the phrase. The following collection of ten original poems demonstrates those features with the motivating observations each taking place in Southwestern Michigan.

owls in night
resonant woodland
resident voice

rain falls silently
soft mist becoming droplets
mocha-skin glistens
a domestic drake
among green-headed mallards
unable to fly

grass florettes
undulating green
see the wind!

lucky find
blue ocean treasure
sand dollar

empty nest
no choice in fledging
crow’s black beak
small painted-turtle
wandered too far from water
not knowing the risk

cirrus clouds
september blue sky
queen anne’s lace

a tropical storm
that was born in Africa
rains on Michigan

firefly
starlight on the lawn
mating dance
Random Aphorisms

By Justin S. Gish
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Our Greatest Accomplishment
All apologies to the wheel, but denial is humankind’s greatest invention. Without it we couldn’t live with ourselves.

On the Luxury of Living One’s Ideals
“I can think of nothing worse than eating meat,” said the vegetarian who’d never gone hungry.

On a Great North American Institution
Always bear in mind that our Democracy, at its most basic, is the majority imposing its will on a minority.

On Genre Distinctions
Literature without pain is pulp.

A Personal Prayer
I was born a Catholic and expect to die an atheist. If by chance I’m wrong and find myself at Peter’s gate, I’ll have an eternity to plead my case.

The Divine Analogy
Ants are to man as man is to God.

On Choosing Sides
You cannot celebrate the deer’s escape without reveling in the wolf’s demise.
Call for Papers, Art Work, Creative Work, and Reviewers

The Hilltop Review:
A Journal of Western Michigan University
Graduate Research

The deadline for submission for the spring 2015 edition is February 2, 2015.

The Hilltop Review is dedicated to promoting scholarship and research at Western Michigan University. We are seeking submissions from all disciplines for the upcoming issue that can speak to the theme of “Changes in Culture and Technology.” Papers that manage to cross disciplinary lines are strongly encouraged, as are papers that critically engage in their discipline and offer new contributions to their field. This is an excellent opportunity to submit part of your dissertation, a particularly strong term paper, or research that you have done.

The specific guidelines for each type of submission and the editorial statement can be accessed at the Review’s website: http://www.wmich.edu/gsa/hilltopreview.

In addition to articles, each edition also features artwork and creative writing by graduate students. Please consider submitting. You do not have to be a graduate student in a creative field to submit creative work or artwork.

Each article goes through a review process that requires the assistance of faculty and graduate students at WMU. If you are interested in being involved in this process, please contact the editor at gsa_hilltop@wmich.edu.
Western Michigan University, Kalamazoo, MI

Graduate Student Association (GSA)