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Letter from the Editor-in-Chief

About a decade ago, I was approached by two TTU students, Nilu Nurinova and Sarah Brinkley, at a chemistry department beginning-of-the-semester cookout. They wanted to know if I would be interested in being the faculty advisor for a proposed student club, the Journal of Sciences club. After listening to them I agreed to be their advisor. They wanted an online journal, so it wouldn't be physically printed, and they had big ideas of journalism as well as peer-reviewed articles in a magazine style. Unfortunately, they had no experience in putting things on the web, but with several students joining the club, it looked as if they could make this work. However, the project was fraught with many technical difficulties, and the club experienced internal strife. After only a year, with only one issue published, it ultimately failed. Afterwards, Nilu and Sarah both agreed that it was a worthwhile venture for them and it made them grow.

Now, years later, I have had the opportunity, afforded to me by EDGE, our new quality enhancement plan at TTU, to help create something more lasting and certainly more significant. This first edition of the Journal of Creative Inquiry was created with the wonderful work of the Editorial Staff; Laura Cruz our Managing Editor had the experience and wisdom to know how to manage the web program and the scheduling of the whole process, Sharon Holderman guided us through the process of obtaining the open journal web program while also allowing the whole TTU campus access to new open journal creation, and Jacob Kelley, our assistant managing editor, who patiently worked with student and faculty submissions and reviewers to get this first edition underway.

Our first edition of JCI is a success, but I envision a great future ahead for this journal; it's going to take time for the whole TTU faculty to learn of the journal and to determine the best way to help students contribute their articles. I have totally embraced the creative inquiry process in both the classroom setting and in my own undergraduate research efforts. I encourage all students at TTU to also embrace the creative inquiry definition and process and to use it to create new scholarly works, art, music, and useful inventions with as much skill and mastered techniques as possible.

Edward C. Lisic, Ph.D.

Director of the TTU Undergraduate Research Program

CISE and URECA!

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ENHANCED DISCOVERY
— T H R O U G H —
GUIDED EXPLORATION

Creative Inquiry:

The process of exploring issues, objects or works through the collection and analysis of evidence including combining or synthesizing existing ideas, products, or expertise in original ways to answer an open-ended question or achieve a desired goal.

About the Cover:

For me, photography is not just a hobby but the opportunity to capture the little details that God has created in our world. Butterflies are among my favorite to capture because of their symbolic nature and their detailed beauty.

Laurel Bull, *Student*

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A Confession of Armor: An Exploration of Book as a Sculptural Object

Kathryn Craig

Revealing the Self (front)



Revealing the Self (back)



Copper, paper, silk, sassafras, faux leather, waxed linen thread
10" H x 19" W x 7" D

Shame, Redacted



Shame, Redacted (detail)



Abaca paper, mild steel, copper, brass chain, faux leather, waxed linen thread
13" H x 10" W x 3" D

Artist's Note

This mixed media project expands the traditional book form into sculptural objects that explore the essence of emotional vulnerability and its role in living an authentic life. Each of the books in the exhibition contains my own poetry as well as writings from my personal journals. The subject of these writings is reflected in how I have chosen to include them within each sculpture.

The content of the work is grounded in self-exploration through writing and sketching ideas, as well as referencing the work of other artists for inspiration and visual guidance informing construction goals. Other inspirations include the writings of Brené Brown, PhD, a vulnerability and shame researcher and storyteller, and Kathryn Schultz, author of *Being Wrong*. Specific processes that were not learned at Tennessee Tech's Appalachian Center for Craft were researched online and through discussion with other artists then tested in the studio. In many cases, multiple samples of a technique were required to achieve the desired results. When success was elusive, modifications were made, often leading to better outcomes through creative explorations.

Molecular Dynamics Simulations on Polymer-Modified Model Asphalts

Joshua Berry

Abstract

Adding polymers to asphalt binder has shown to increase the performance of asphalt. In this study, Molecular Dynamics simulation was performed to predict physical and transport properties of asphalt mixtures modified with several polymer modifiers. Polyethylene, polystyrene, and poly(styrene-butadiene) rubber were individually added to the ternary asphalt model mixture of Zhang et al. [1] and important properties were calculated. Each mixture was simulated at four different temperatures – ranging from 25 °C to 170 °C. Mass density, diffusion coefficients, and radial distribution functions were calculated for each simulation. It was found that different polymers can modify the model asphalt property and microstructure differently, and the simulation predictions can agree with experimental data.

Introduction

Asphalt is a very diverse mixture of organic molecules containing more than 1 million different molecules in a given sample. It is derived from crude oil, and is the remaining fraction after distillation. This viscous tar is called asphalt “binder” and is mixed with aggregate gravel to form road pavement, but asphalt pavement has problems with its performance in extreme conditions. For example, asphalt pavement is susceptible to cracking at low temperatures and rutting at high temperatures. This is primarily caused by a strong temperature susceptibility on its physical properties. For instance, the viscosity changes too greatly with a given change in temperature [2]. Additives such as polymers have helped mitigate low-temperature fatigue cracking in asphalt pavements. In order to know what kind of polymer modifier should be added, and how much polymer should be added, understanding the relationships

between the chemical composition, microstructure and physical and mechanical properties of asphalt is important. Molecular dynamics simulation is the desired way to supply such kind of information.

In order to do simulations on complicated asphalt mixture, different analyses were done. SARA analysis is an analysis which classifies crude oil based on solubility in organic solvents. Molecule types are saturates, aromatics, resins, and asphaltenes. Classification of the different types of molecules found in asphalt mixtures allows for the construction of a model to be built to approximate the properties of asphalt using computer simulation programs. The ternary model of Zhang et al. was used in these simulations to approximate asphalt binder without aggregate [1]. It is comprised of 5 asphaltene2 molecules, here asphaltene2 is a averaged asphaltene molecule, 30 1,7-dimethylnaphthalene molecules, and 45 n-

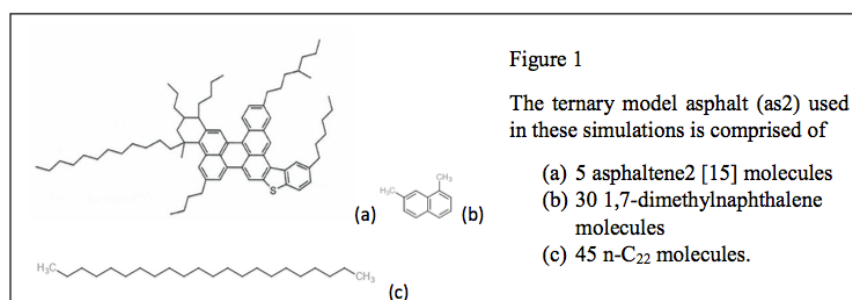
C22 molecules with molecular structures and compositions of model asphalt mixture (as2) shown in Figure 1. This ratio best approximates the composition and properties of true asphalt mixtures [3].

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Molecular Dynamics (MD) programs utilize equations of classical mechanics to displace atoms in a simulation box. In many cases, small systems can be simulated to predict macroscale properties of substances. MD programs such as LAMMPS simulations, can lead to an understanding of the behavior of substances on a molecular scale. Periodic Boundary Conditions (PBC) play an important role in MD program, because they allow for a continuous medium in which intermolecular interactions can be calculated without worrying about the surface effect. Figure 2 shows that if a particle passes through the side of the simulation box, it will be accounted for by moving its image into the same box from the opposite side. PBC allow for macroscopic properties to be calculated by actually simulating only several thousand atoms.



The addition of a polymer to asphalt binder has proven to change rheological properties of asphalt pavement [4], thus mitigate pavement cracking problems. Another benefit of polymer modification is the reduction of temperature susceptibility of the asphalt binder — the primary factor in improving cracking resistance. Problems still exist with compatibility between asphalt binder and certain polymers. Asphalt-soluble polymers should be chosen in order to ensure property consistency throughout the mixture. Aromatic oil is commonly added to improve the compatibility between polymers and asphalt [5].

Studies have shown adding polymers such as polystyrene-butadiene-styrene (SBS) and styrene-butadiene rubber (SBR) have experimentally improved performance of asphalt binder by modifying its physical and elastic properties. The primary method of determining the improvement of polymer-modified asphalt is the evaluation and comparison of: density, viscosity, thermal expansion coefficient, softening point, and modulus. Since polymer modification has been a topic of research for years, prior research has provided some guidance in choosing optimal polymers for asphalt modification. Popular polymers used in asphalt modification are styrene-butadiene styrene (SBS) triblock copolymer and styrene-butadiene rubber (SBR) [4]. Other polymers such as acrylate-styrene-acrylonitrile (ASA), polyethylene (PE), ethylene vinyl acetate (EVA), and natural rubber are potential modifiers [6] [7] [8]. Experimentally, it was determined PE does not mix well with asphalt binder. Storage stability analysis showed the PMA separated into two phases [9]. Polymers have been chosen based on cost-effectiveness, availability, and prior knowledge

of improving asphalt mixtures. In this project, the polymers to be simulated with model asphalt are: polyethylene, polystyrene, and styrene-butadiene rubber.

Prediction of major physical and mechanical properties of model asphalt in a controlled environment, such as a computer program, allows researchers to compare properties of unmodified asphalt to polymer-modified asphalt with a control of molecular ratios and length of polymer chains. In this research, in total three polymers as listed above were studied for their effects on the microstructure and macroscopic properties of model asphalt binders through the use of Molecular Dynamics simulations.

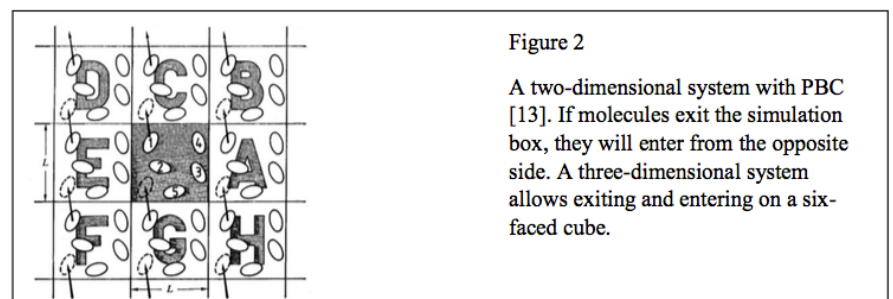


Figure 2
A two-dimensional system with PBC [13]. If molecules exit the simulation box, they will enter from the opposite side. A three-dimensional system allows exiting and entering on a six-faced cube.

Simulation Methods

Realistic polymers have high molecular weights and typically have thousands of monomers in one molecule. In this study, polymers were shortened to minimize computation time without compromising accuracy of the simulations. The length of each polymer molecule was limited to 50 monomers. Table 1 contains details about each simulation. The mixtures were simulated at 298.15 K, 358.15 K, 400.15 K, and 443.15 K. The upper bound of this temperature range corresponds to the mixing temperature of hot-mix asphalt [10].

Mixture	Total Number of Atoms	Monomers in Polymer Molecule	Molecular Weight of Polymer (g/mol)	Mass Fraction of Polymer
as2	4635	-	-	0.0000
as2 + PE	4937	50	1404.6958	0.0580
as2 + PS	5440	50	5223.6026	0.1864
as2 + SBR	5287	50	3958.0808	0.1479

A combination of Molecular Dynamics (MD) and Monte Carlo (MC) programs was used to simulate these systems to reach an equilibrated state. After the equilibrated state was reached, physical properties were calculated. The Monte Carlo for Complex Chemical Systems (MCCCS) Towhee program [11] was used to initialize the structures of each molecule type before simulating the mixtures. The MD program Large-scale Atomic/Molecular Massively Parallel Simulator (LAMMPS) [12] was used to equilibrate the systems.

The All-Atom Optimized Potential for Liquid Simulations (OPLS-aa) force field was used. After an optimal structure was obtained for each molecule type, the mixture system was initialized by placing different types of molecules on a cubic lattice in Towhee. The isobaric-isothermal (NPT) ensemble was used in LAMMPS to equilibrate the systems. After equilibrium was achieved, physical and microstructural properties were calculated. Density, diffusion coefficients, and radial distribution functions were calculated for the mixtures.

Density was output from LAMMPS automatically. Diffusion Coefficients were calculated for each molecule type using the mean-square displacement (MSD) of each

molecule, also known as the Einstein Relation [13]. Equation 1 relates the diffusion coefficient, D , to time, t , and position, r . Diffusion Coefficients were calculated by averaging the MSD for each molecule type at each step. These displacements were plotted over a time interval of at least 8 ns and fit to a linear regression line. The slope of that line is proportional to D .

$$2tD = \frac{1}{3} \langle |\mathbf{r}_i(t) - \mathbf{r}_i(0)|^2 \rangle$$

Equation 1

The pairwise radial distribution function, $g(r)$, is a probability density function used in determining packing distances between atoms or molecules. Here, $g(r)$ was calculated between same and different molecule types. To closely approximate the center of mass $g(r)$ for molecule types, one atom near the center of mass was chosen to represent the molecule. The radial distribution functions were calculated over a trajectory of more than 4 ns to maximize statistical accuracy.

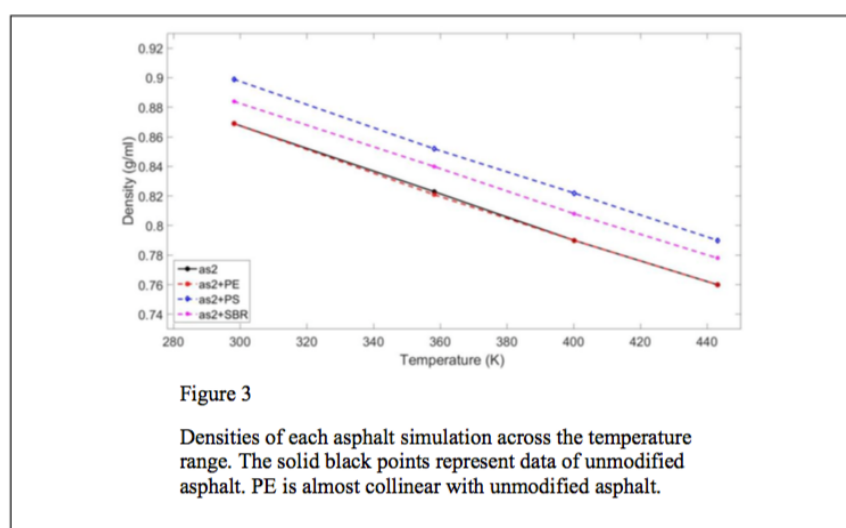
Results and Discussion

The calculations presented here were all calculated from an equilibrated simulation. Each simulation was performed for at least 10 ns before calculating these properties.

Density

Mass density was calculated for each system at the four temperatures. Figure 3 shows the relationship graphically. The relationship between density and temperature was shown to be linear. Polyethylene did not significantly change the density of the model asphalt, while polystyrene and SBR increased the density.

This is likely due to two factors. The mass fraction of PE is small (5.8 %), and the density (at 25 °C) of low density polyethylene (LDPE) is 0.91 – 0.96 g/ml [REF]. A mixture of LDPE and the model asphalt in this proportion should not be expected to have an increased density. PS and SBR both increased the density of the ternary model asphalt. This behavior is likely attributed to the large mass fractions of PS and SBR (18.64 %, and 14.74 % respectively). A large mass fraction and a large difference in densities of asphalt binder and these polymers are likely to explain this behavior of increased densities.



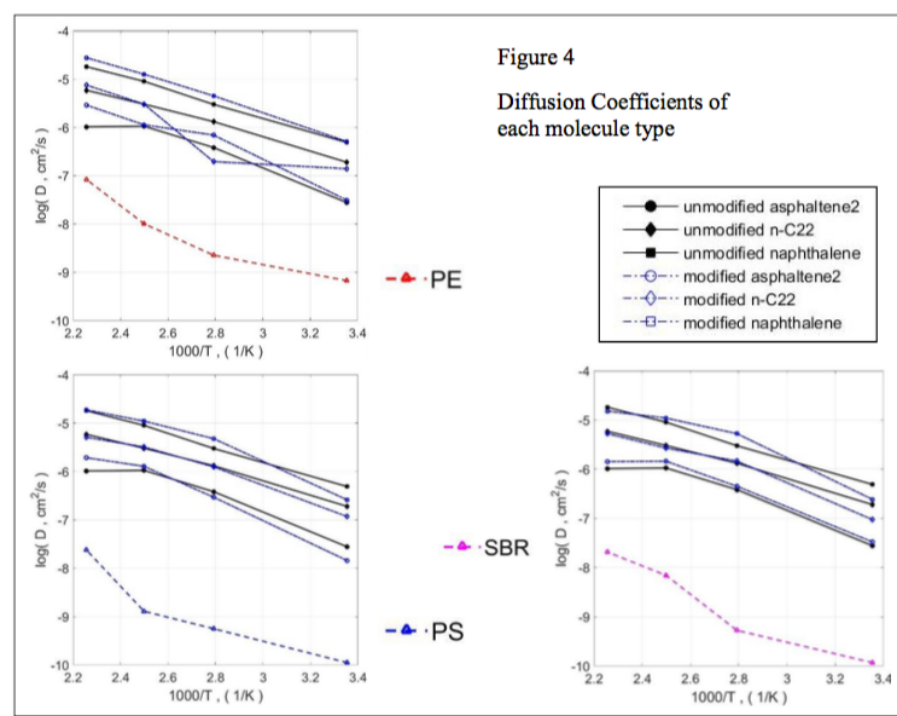
Diffusion Coefficient

The diffusion coefficient is a measure how fast a particle moves through a medium. It can be calculated with MD by measuring the average displacement of a particle over time.

The diffusion coefficient for each component was calculated. On a logarithmic scale, the diffusion coefficients of each constituent increased with respect to temperature fairly linearly. Poor statistics contributed to the nonlinear relationships observed in Figure 4.

Molecular weight was shown to have an effect on the diffusion coefficient. The heaviest molecules diffused slowest. PE diffused the fastest of the three polymers in asphalt.

fastest of the three polymers in asphalt. Generally, the addition of a polymer molecule increased diffusion coefficients of each asphalt constituent, which is consistent with prior calculations [2]. Poor statistics are most prevalent in the polymer and asphaltene2 results due to the averaging of 5 or fewer molecules.



Radial Distribution Functions

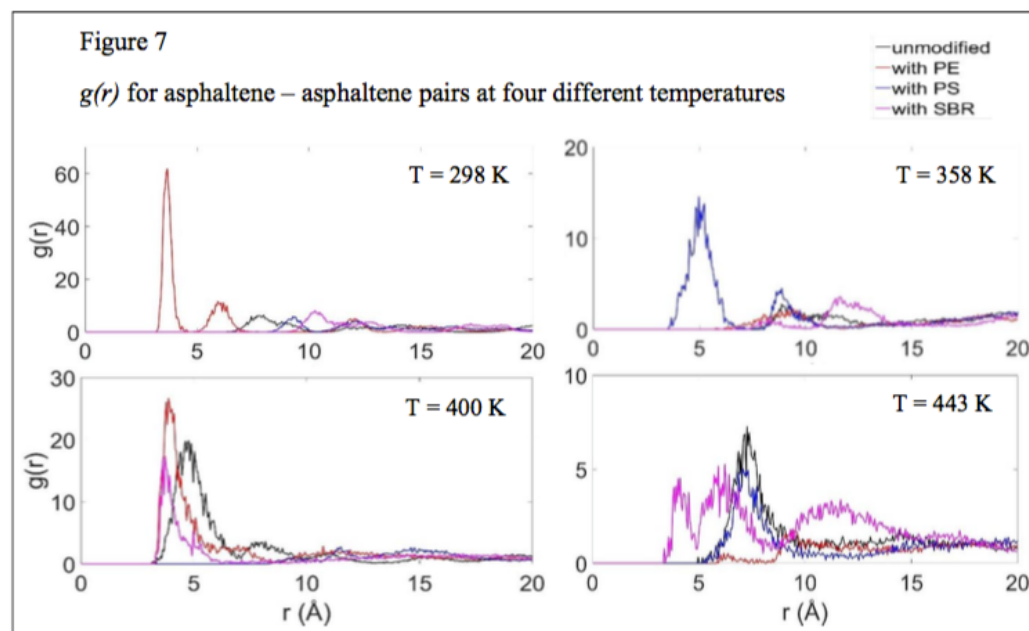
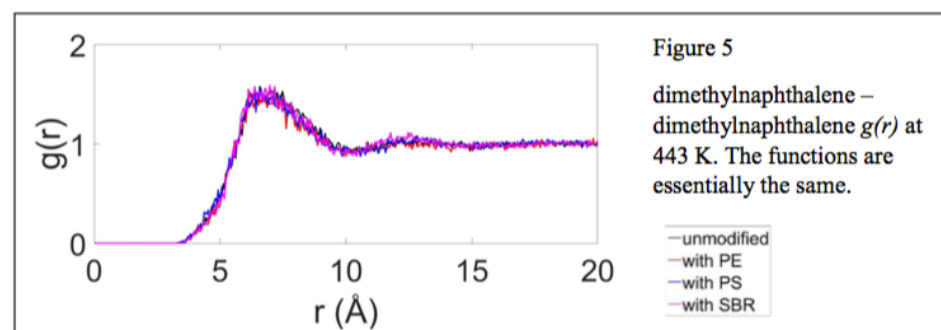
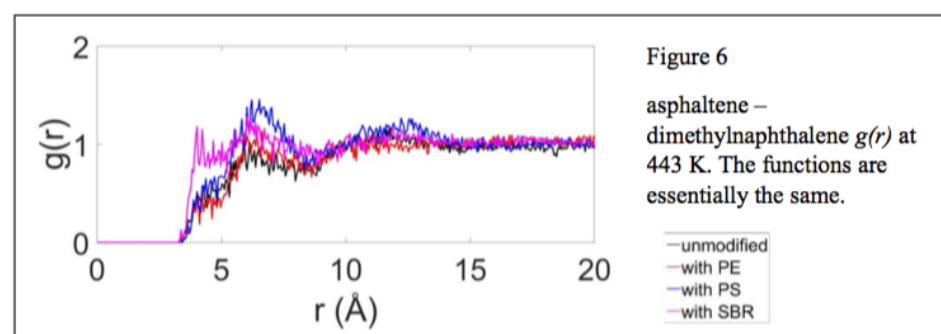
The pairwise radial distribution functions, $g(r)$, is a probability density function used to determine the most probable distance between atom pair or molecule pair. In this work, it was calculated for asphaltene – asphaltene pairs, asphaltene – dimethylnaphthalene pairs, and dimethylnaphthalene – dimethylnaphthalene pairs. The first peak position, d_0 , is the most probable distance in which atoms or molecules prefer to stay in relation to one another. The movement of d_0 indicates a change in microstructural packing. A first peak distance which has decreases after certain conditions have been applied to the system indicate a closer packing distance, since the most probable distance between the specified atoms decreased.

Asphaltene – dimethylnaphthalene and dimethylnaphthalene – dimethylnaphthalene pairs were not significantly affected by the addition of a polymer. Figure 6 and Figure 5 show the asphaltene – dimethylnaphthalene and dimethylnaphthalene – dimethylnaphthalene pairs respectively for the simulations at 443 K. At 298 K, 358 K, and 400 K, similar behavior was observed. The $g(r)$ did not significantly change upon the addition of a polymer. Since the behavior and d_0 of these distribution functions remained about the same, the addition of polymer modifiers is not likely to affect packing distances between asphaltene and resin, nor resin and resin.

Changes to $g(r)$ can be seen in Figure 7, which shows the radial distribution function for asphaltene – asphaltene pairs. These functions changed greatly with temperature and polymer identity. At 298 K, d_0 between asphaltene molecules decreased when PE was added and increased when PS and SBR were added. At 358 K, d_0 decreased upon the addition of PS, remained about the same when PE was added, and increased when SBR was added. At 400 K, both PE and SBR decreased d_0 , while the addition of PS did not show a first peak position near the others. At 443 K, the temperature at which asphalt binder is mixed with aggregate, d_0 decreased upon the addition of PS and SBR, and increased after adding PE. First peak distances are expressed in Table 2. First Peak Distance d_0 (in Å) for Asphaltene2 Molecule Pairs in Original and Modified Ternary Asphaltene2 Systems

These $g(r)$ results are likely to reflect poor statistical sampling, because of the small

because of the small system size. The model asphalt mixture sample used here contained only 5 asphaltene2 molecules. Distances between these asphaltene molecules may have been obstructed or constrained by other constituents or the added polymer. The systems were simulated for more than 10 ns in order to ensure equilibration of the model asphalt, yet more time may be needed for polymers to relax [14].



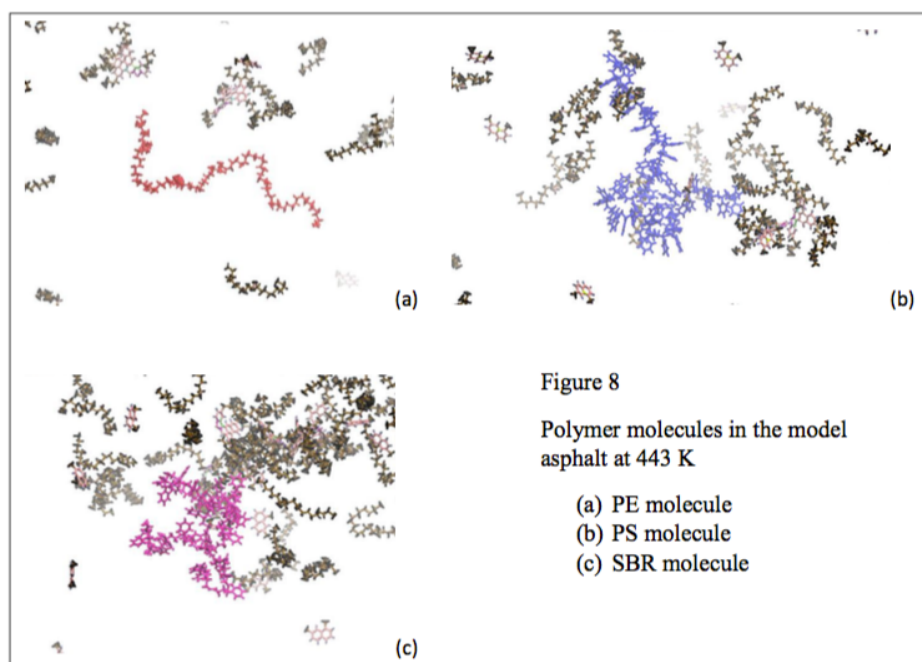
Temperature (K)	Ternary Asphaltene2 systems	Polyethylene-Modified	Polystyrene-Modified	SBR-Modified
298.15	7.775	3.675	9.275	10.28
358.15	8.875	9.325	4.975	8.275
400.15	4.775	3.875	11.53?	3.725
443.15	7.275	9.325	7.075	4.545

Table 2. First Peak Distance d_0 (in Å) for Asphaltene2 Molecule Pairs in Original and Modified Ternary Asphaltene2 Systems

Microstructure

Different from quantitative calculations, some information can also be gathered from qualitative observations of the simulations. Aside from the theoretical benefits of PMA, it is vital to know realistic behavior of the materials. Polymers may be able to improve the physical properties and temperature susceptibility of asphalt, but realistic problems arise when having to transport, store, and implement asphalt binder.

Figure 8 shows the three polymers used in this work in their asphalt binder environments. PE did not interact with the model asphalt binder in the way PS and SBR interacted with the asphalt binder. This behavior is consistent with the biphasic separation observed in storage stability analysis by Polacco et al. [9]. Equilibrium trajectories were analyzed for 6 ns and it was found the structure of the PE molecule remained fairly linear and was not surrounded by saturate, resin, nor asphaltene molecules. PS and SBR appeared well-solvated by the asphalt constituents. 1,7-dimethylnaphthalene, PS, and SBR have aromatic features, which likely attributes to the solvation of these two polymers.



Conclusions

In order to understand polymer modification of asphalt binder on a molecular scale, computer simulations were used to quantify properties of unmodified model asphalt binder and model asphalt binder modified with polyethylene, polystyrene, and poly(styrene-butadiene) rubber. Density, diffusion coefficients, and radial distribution functions were calculated. Aside from quantitative analysis, it was also observed polyethylene is likely to be insoluble in asphalt binder. This observation is consistent with experiential observations in industry.

Through the use of Molecular Dynamics software, it was determined polyethylene, polystyrene, and SBR rubber may be appropriate modifiers in asphalt modification. More Molecular Dynamics simulations and experimental field testing should be performed for accuracy.

Acknowledgments

The authors would like to express their gratitude for the financial support from the Creative Inquiry Summer Experience (CISE) fund. This fund was a part of the Quality Enhancement Plan (QEP) at Tennessee Technological University. This work would not have been possible without the computing resources from Ohio Supercomputer Center and Tennessee Technological University's Computer Aided Engineering (CAE) computer. Tessa Eskander was very helpful by providing innovative ideas throughout the duration of the research. Michael Renfro and Marbin Pazos- Revilla both provided assistance when computing issues arose.

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Synthesis of a New Molecule, 2,3-Butanedione Tertbutylthiosemicarbazone (BDMO-tBTSC) and Characterization By A New 500 MHz Nuclear Magnetic Resonance Spectrometer

Hannah Michelle McFadden†, Todd Watson, Antonia Susnjar, William R. Carroll, & Edward C. Lisic

Abstract

This work reports the synthesis of a new, never before reported molecule, which is 2, 3-butanedione monoxime tertbutyl-thiosemicarbazone (BDMO-tBTSC), and its characterization by ¹H NMR (Nuclear Magnetic Resonance spectroscopy), ¹³C NMR, and HSQC (Heteronuclear Single Quantum Coherence) NMR. Assignment of the ¹H signals was supported by ¹H-¹⁵N HSQC, and is consistent with our proposed structure.

Keywords: Thiosemicarbazones, Monoxime, Nuclear Magnetic Resonance

Introduction

The organic compounds known as oximes have a long history and were first discovered and characterized in the 1880's by chemist Victor Meyer in Germany (1). One of the interesting chemical facets of oximes is their ability to bind to transition metal ions (2). An example of one of these, dimethylglyoxime, or DMG, is used throughout the U.S. in freshman chemistry lab classes as a chelating agent for the Ni²⁺ ion (3). The demonstrative reaction of the two chemicals in water produces an immediate blood-red precipitate of the Ni(DMG)₂ complex.

Of interest to us is the class of organic compounds known as thiosemicarbazones, which have generated many literature articles in recent years due to their biological properties. The biological properties of thiosemicarbazone compounds have been well-documented in the

literature for several decades, and include anti-fungal and anti-bacterial agents, as well as many potential medicinal agents including anticancer agents (4)-(6). The most important of these thiosemicarbazone compounds used today is the anti-cancer drug known as Triapine, which has been in Phase II clinical trials for several years (7)-(8). Triapine has been shown to be a potent ribonucleotide reductase inhibitor, and this ability is what makes it useful as an anti-cancer agent, since ribonucleotide reductase is an important enzyme absolutely essential for human DNA replication in mitotic cell division.

Our lab has been active in synthesizing and characterizing thiosemicarbazones, so the attempt was made by us to attach an oxime group to a thiosemicarbazone molecule using the following synthesis pathway, shown in Figure 1, which utilizes 2,3-butanedione

monoxime as the primary starting material. We used 4-tertbutyl-3-thiosemicarbazide as the reagent which couples at the ketone carbon via a typical condensation reaction (9).

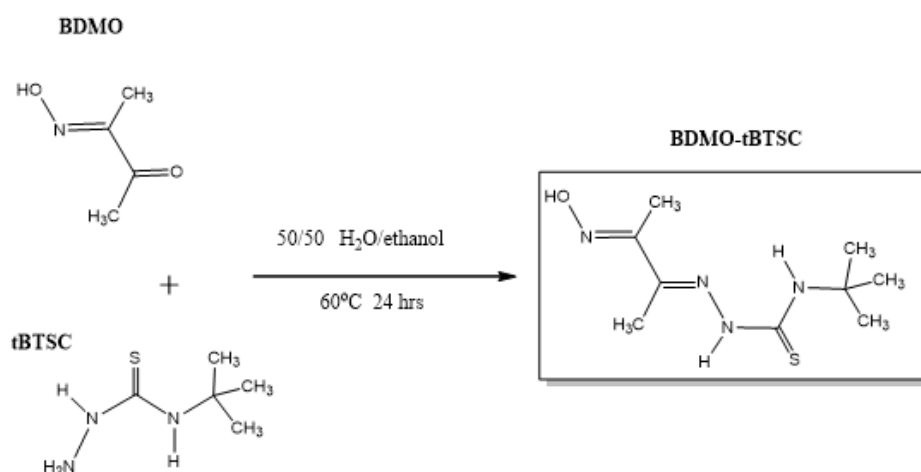


Figure 1: The reaction of 2,3-butanedione monoxime with 4-tertbutyl-3-thiosemicarbazide to produce the title molecule, **BDMO-tBTSC**.

This work reports the synthesis of a new molecule BDMO-tBTSC, and the NMR characterization of this new compound in the hope of providing a foundation for further research into promising members of the oximethiosemicarbazone series.

Acronyms

BDMO = 2,3-butanedione monoxime

tBTSC = 4-tertbutyl-3-thiosemicarbazide

BDMO-tBTSC = 2,3-butanedione tertbutyl-thiosemicarbazone

NMR = Nuclear Magnetic Resonance

HSQC = Heteronuclear Single Quantum Coherence

Experimental Section

The 4-tertbutyl-3-thiosemicarbazide (tBTSC), and 2,3-butanedione monoxime were all purchased from the Sigma-Aldrich Chemical Company. The other reagents and solvents that were

used in this research were purchased from the Sigma-Aldrich, ARCOS and Fisher chemical companies. All materials were reagent grade or better and were used without further purification. The ¹H NMR spectra were obtained on a Bruker Ascend-500 Multi-Nuclear NMR spectrometer.

Three different methods to synthesize the 2, 3-butanedione tertbutyl-thiosemicarbazone molecule:

1. A 50mL Erlenmeyer flask containing a magnetic stir bar was placed within the hood, and 1.004g (6.82 x 10⁻³ mol) of 4-tert-butyl-3-thiosemicarbazide and 0.814g (6.82 x 10⁻³ mol) of 2, 3-butanedione monoxime were added to the flask, along with 15 mL of isopropanol as solvent. One drop of concentrated H₂SO₄ was added to the reaction mixture to catalyze the reaction. The mixture was heated to 60°C and left to react overnight. The solution was concentrated to 5 ml of solvent. At this time the product precipitated out of solution as off-white crystals. The product was vacuum-filtered and thoroughly dried. The total yield of product (BDMO-tBTSC) was 0.817g (3.55 x 10⁻³ mol, 52.1% Yield).

2. A 50-mL Erlenmeyer flask containing a magnetic stir bar was placed within the hood, and 1.013g (6.88 x 10⁻³ mol) of 4-tert-butyl-3-thiosemicarbazide and 0.819g (6.88 x 10⁻³ mol) of 2,3-butanedione monoxime were added to the flask, along with 25 mL of a solution consisting of 50% ethanol and 50% water as solvent. One drop of concentrated H₂SO₄ was added to the reaction mixture to catalyze the reaction. The mixture was heated to 60°C and left to react overnight. The resulting white precipitate was vacuum-filtered and dried. The total yield of (BDMO-tBTSC) product was

1.264g (5.49×10^{-3} mol, 79.9% Yield).

3. A 50-mL Erlenmeyer flask containing a magnetic stir bar was placed within the hood, and 1.018 g (6.92×10^{-3} mol) of 4-tert-butyl-3-thiosemicarbazide and 0.837g (7.019×10^{-3} mol) of 2,3-butandione monoxime were added to the flask along with 25 mL of a solution consisting of 50% ethanol and 50% of 5% acetic acid as solvent. The mixture was heated to 60°C and left to react overnight. The resulting white precipitate was vacuum-filtered and dried. The total yield of (BDMO-tBTSC) product was 1.424g (6.19×10^{-3} mol, 89.6% Yield).

[1] 2,3-butanedione tertbutylthiosemicarbazone (BDMO-tBTSC),

N- Tertbutyl- 2- [2- (hydroxyimino) - 1- methylpropylidene] -hydrazinecarbothioamide.

¹H NMR (500 MHz, DMSO-d₆) δ 11.64 (s, ¹H), 10.13 (s, ¹H), 7.71 (s, ¹H), 2.09 (s, ³H), 1.96 (s, ³H), 1.51 (s, ⁹H).

¹³C NMR (126 MHz, DMSO-d₆) δ 176.21, 154.00, 146.19, 52.64, 28.39, 11.75, 9.12.

Results and Discussion

The reaction for the synthesis of compound [1] BDMO-tBTSC is depicted in Figure 1, and our first synthesis procedure utilized isopropanol as the solvent and a catalytic amount of sulfuric acid. The reaction was a success in that the product was formed, but the BDMO-tBTSC was so soluble in the isopropanol solvent that it wouldn't precipitate out of solution until the solvent was removed down to 5ml or less. In working with the compound and trying various solvents, we found that the compound was

much less soluble in water, so we adjusted the reaction conditions by using a 50/50 mixture of ethanol and water with the catalytic amount of sulfuric acid. Simultaneously, we tried using a 50/50 mixture of ethanol and 5% acetic acid to do the same reaction. This synthesis attempt had the advantage of using a weak acid (acetic acid) instead of the strong acid (concentrated sulfuric acid). All three procedures produced the title compound, as shown by ¹H NMR spectroscopy, but the third procedure gave the highest yield of product.

At TTU, we just received a National Science Foundation grant to purchase a new 500 MHz Bruker NMR spectrometer. This new state-of-the-art instrument is capable of NMR experimentation (such as ¹H-¹⁵N HSQC) that we have never been able to do previously at TTU. This paper describes some of that work in the following paragraphs.

The ¹H NMR spectrum of compound [1] is shown in Figure 2, and provides evidence for the structure of the molecule. The ¹H NMR spectrum shows peaks due to distinct proton signals, which correspond to particular hydrogen atoms in the compound. This gives us good evidence that we have not only made the compound, but we can also assign resonance peaks to every hydrogen atom in the compound.

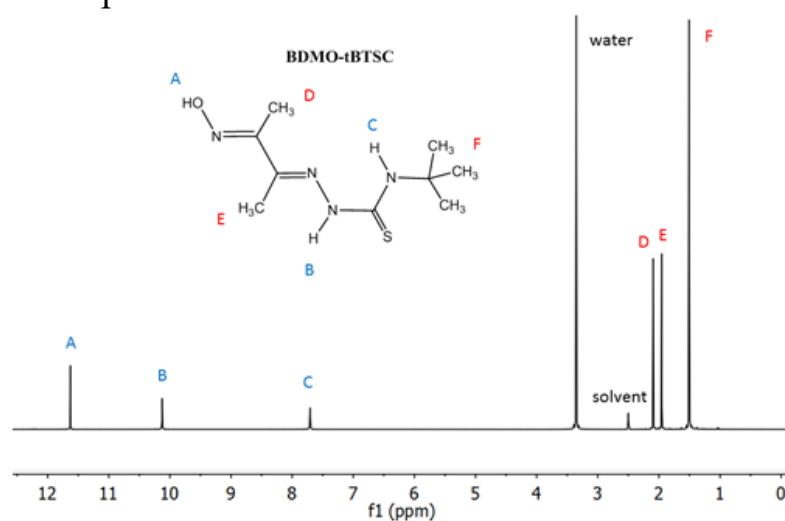


Figure 2: The ¹H NMR spectrum of BDMO-tBTSC in DMSO-d₆ solvent. (DMSO = dimethylsulfoxide)

The upfield protons in red (D, E, and F) are relatively easy to assign. The nine protons on the methyl groups on the tert-butyl group (F) appear as a singlet with an integration of nine protons at 1.51 ppm. The three protons for either D or E are singlets with an integration of three protons each, at 2.09 ppm and 1.96 ppm respectively. The protons of D, which are relatively close to the oxime group, are assigned to the more downfield peak at 2.09 ppm since they are in a more electronegative environment than the protons of E.

The downfield protons in blue (A, B, and C) are all singlets of integration of one proton each. Even though peak A looks bigger, it is actually much more narrow and sharp than B and C, which are relatively broader.

The decoupled ^{13}C NMR spectrum of BDMO-tBTSC in DMSO-*d*6 solvent is shown in Figure 3. We have again labeled the carbon atoms of the molecule, this time with numbers, C1-C7, to designate their position in the molecular structure, and also their corresponding resonance in the NMR spectrum. The resonances were assignable to the corresponding carbon atoms, with the most downfield peak being assigned to the thione (C=S) carbon.

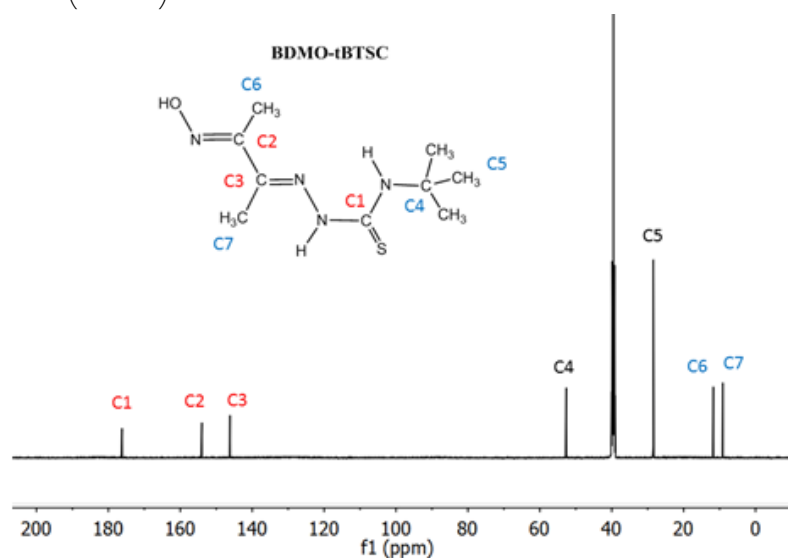


Figure 3: The ^{13}C NMR spectrum of BDMO-tBTSC in DMSO-*d*6 solvent. The carbon atoms are labelled, and the large peak at ~ 40 ppm is the DMSO solvent.

The resonance peak assigned to the thioamide proton, labeled C in Figure 2, is consistent with this thioamide proton in several other compounds that we have previously published (9). However, the hydrazinic proton, labeled B in Figure 2, and the oxime proton, labeled A in Figure 2, are ambiguously assigned; we are not actually sure of their assignment. They could be reversed. This is where we used a relatively new NMR experimental technique called HSQC to rid us of the ambiguous assignments.

Heteronuclear Single Quantum Coherence (HSQC) or Heteronuclear Single Quantum Correlation is a powerful experiment used in NMR spectroscopy of organic molecules, and proteins. The experiment was first reported in the literature in 1980 by Bodenhausen and Ruben (10). The resulting plot from this NMR experiment is two-dimensional (^2D) with one axis for proton (^1H) and the other for a heteronucleus (an atomic nucleus other than a proton), which is usually ^{13}C or ^{15}N ; here we utilize the ^{15}N nucleus. The spectrum contains a peak for each unique proton attached to the heteronucleus being considered, observed by their 1 bond ^1H - ^{15}N coupling. So, this experiment allows us to “see” which proton is attached to which nitrogen atom in our BDMO-tBTSC molecule.

In Figure 4, the 2d (^1H - ^{15}N) HSQC plot is shown for the BDMO-tBTSC molecule. The ambiguously defined proton resonances at 11.64 ppm and at 10.13 ppm can now be definitively assigned.

In the X-axis ^1H spectrum portion of the HSQC plot in Figure 4, we see that the resonance at 11.64 ppm shows that that particular proton is not directly bound to a nitrogen atom because there is no respective

signal from the ^{15}N nuclei in the molecule (the ^{15}N spectrum is on the Y-axis). However, we do see that the proton that resonates at 10.13 ppm is directly bound to a nitrogen atom in the molecule, because there is a corresponding signal at about 210 ppm from a ^{15}N nucleus. It also shows that the thioamide proton peak at 7.71 ppm has, as we already suspected, a corresponding signal from the nucleus of the nitrogen atom it is bound to in the molecule, which resonates at 250 ppm.

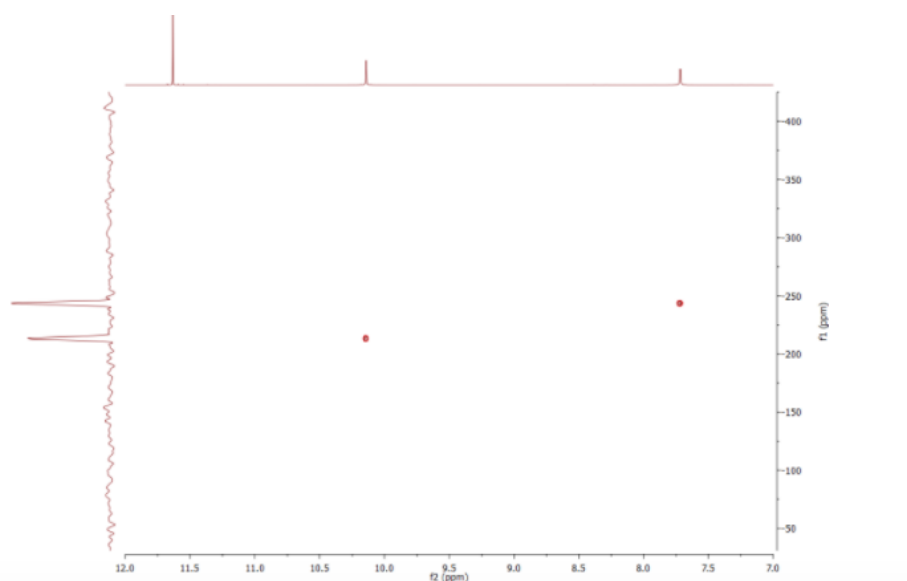


Figure 4. The ^2D HSQC spectrum of BDMO-tBTSC in the downfield region. The X-axis is the ^1H spectrum between 7-12 ppm, and the Y-axis is the ^{15}N spectrum between 25-425 ppm.

Therefore, we can now unambiguously assign every proton to its corresponding resonance in the ^1H NMR spectrum of the BDMO-tBTSC molecule, as seen in Figure 2.

With this work completed on the NMR characterization of this new molecule, we hope to expand our research to include other chemical analogs of the oxime-thiosemicarbazone class of molecules with the confidence that we can use our new 500 MHz instrument to characterize them. Once that is done we can proceed with testing of their biological behaviors, and report our work in another peer-reviewed journal.

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Scaffolding Independent Writing in Kindergartners

Jessica L. Nabors & Jane E. Baker

Abstract

During the 2013/2014 academic years, the authors received a URECA grant to explore the effectiveness of the Scaffolded Writing teaching practice on young children's writing. Five kindergarten children were tutored once or twice a week with the Scaffolded Writing protocol. The kindergartners' letter identification, phonemic/phonics awareness, and writing complexity were evaluated pre- and post-intervention with three tools from The Observation Survey for Early Literacy Achievement (Clay, 2013). The participants' stanine scores on all three evaluation measures increased or remained constant after three months of intervention. Writing samples are included.

Introduction

During journal writing time, a kindergarten teacher looked over the shoulder of one her students. She noticed that the girl had written "I like my cats" four days in a row. "Wow! You must really like cats. What are your cats' names?" asked the teacher. "Oh, I don't have any cats. I have four rabbits," explained the girl, "but I don't know how to spell 'rabbit'."

The girl's creative expression was censored by her own expectation that her spelling be conventional. She continually limited her writing to familiar, safe words such as "like" and "cats", when perhaps she wanted to communicate more personal or interesting messages. The above scenario is not uncommon in primary grade (K-3) classrooms. Primary teachers often struggle with how to get their novice writers to take chances and write meaningful messages. Yet there exists a simple teaching practice that addresses the needs of novice or emergent writers. Bodrova and Leong (1998) coined this practice Scaffolded Writing. The authors claimed that Scaffolded Writing encourages emergent writers to take risks and write their

thoughts down on paper. As a teaching tool, Scaffolded Writing supports children's emergent writing and facilitates the transition to independent writing. Scaffolded Writing is a "successful application of the Vygotskian concept of the zone of proximal development (ZPD) applied to the area of literacy learning" (Bodrova & Leong, 1998, p. 1). In other words, a teacher can work with a student at his/her instructional level with the goal of moving the student to independence. With Scaffolded Writing, the teacher begins by supporting the learners' writing with scaffolding techniques, then learners use the scaffolds on their own, and ultimately the learners write unassisted.

During the 2013/2014 academic year, we received an Undergraduate Research and Creative Activity (URECA) grant award to explore the effectiveness of the Scaffolded Writing teaching practice. We used funds from the award to purchase writing tools, video cameras, audio-recorders, and transcription software. The purpose of our research study was to determine the impact of the Scaffolded Writing practice on students' learning. Specifically, we sought to answer

three questions:

1. How does the Scaffolded Writing teaching practice improve kindergarten writers' letter identification?
2. How does the Scaffolded Writing teaching practice improve kindergarten writers' phonemic and phonics awareness?
3. How does the Scaffolded Writing teaching practice improve kindergarten writers' quantity and quality of writing?

Related Literature

In 1996, Elena Bodrova and Deborah Leong wrote a book and created a curriculum known as Tools of the Mind. The Tools of the Mind curriculum is described as a research-based approach to teaching early literacy.

Scaffolded Writing is the primary tool for teaching writing in the Tools of the Mind approach. The Tools of the Mind website describes this teaching practice: "In scaffolded writing, children first plan what they want to write, draw it, and then write it, with the help of multiple mediators, such as lines drawn to represent words. The form that the writing takes (scribbles, lines, initial letter sounds, estimated/invented spelling, word patterns) depends on where children are in their writing development" (para. 25).

Bodrova and Leong (1995) conducted a controlled study of the Scaffolded Writing teaching practice with 115 kindergartners in an experimental group and 115 kindergartners in a control group. For the children taught with Scaffolded Writing, significant differences were found including: the number of words the children wrote, the complexity of their written messages, the

number of new words in their writing, the children's use of conventions, the children's use of accurate spelling, and the children's concept of a sentence. Due to time constraints and limited resources, we did not replicate this controlled study, rather we conducted a multiple case study with only five kindergarten participants.

In 2013, kindergarten teacher Amanda VanNess developed a writing program that incorporated the Scaffolded Writing practice (VanNess, Murnen, & Bertelsen, 2013). Not only did the authors lay out the exact steps of the process and how each step was designed to model effective writing practices, they also made explicit connections to how this practice shows exactly where individual students are developmentally with their writing.

Scaffolding Writing allows us to see how well a student uses correct letters to represent sounds, use correct (or invented) spelling, use proper spacing between words and capitalization, demonstrate directionality, and illustrate their writing with drawings (p. 579-580). Use of the Scaffolded Writing practice in her writing program yielded samples that exceeded standard expectations for kindergarten writing. Similar to the VanNess study, our research with individual kindergarten students yielded exemplary writing samples.

Limited research exists on the effectiveness or impact of this teaching practice on student learning (Bodrova & Leong, 1995; VanNess, Murnen, & Bertelsen, 2013). However, the research that has been conducted has yielded results that confirm the effectiveness of Scaffolded Writing. We wished to confirm the power of this teaching practice for ourselves.

Methodology

To determine the impact of the Scaffolded Writing practice on students' learning, we measured five kindergarten students' learning pre- and post- intervention in three domains: letter identification, phonemic/phonics awareness, and writing vocabulary. Specifically, we sought to answer these three research questions:

1. How does the Scaffolded Writing teaching practice improve kindergarten writers' letter identification?
2. How does the Scaffolded Writing teaching practice improve kindergarten writers' phonemic and phonics awareness?
3. How does the Scaffolded Writing teaching practice improve kindergarten writers' quantity and quality of writing?

Participants and Setting

We conducted a multiple case study with five kindergarten students. Upon approval from our university's Institutional Review Board, five kindergarten children were randomly selected by the researchers from the participating teacher's class list. We did not have particular selection criteria other than the participants had to be kindergartners. There were three boys and two girls. The kindergartner's names and identifying information were anonymized for presentation and publication purposes. These students belonged to a classroom of approximately 20 typically-developing peers in rural Putnam County, Tennessee.

The classroom teacher agreed without hesitancy to let us work with her students. Parents of the five children signed the

necessary consent forms. The undergraduate student author had prior experience working with the classroom teacher. We knew the classroom teacher provided a developmentally appropriate learning environment. A developmentally appropriate learning environment is one in which the developmental needs of children are met. Gestwicki (2011) outlined the developmental needs of primary-age children: "They need physical environments that help them develop a sense of industry by succeeding at learning tasks that match their mostly pre-operational learning style. They need environments that allow them to assume active roles in planning and directing their learning... They need environments that help their emerging interest and skills in literacy" (p. 216).

Our research took place during non-direct instruction periods of the kindergarten day, such as snack time, center time, or nap time (for the kindergartners who didn't usually take naps). We worked with the children in an empty classroom next to their primary classroom. This was a quiet, comfortable location for the kindergartners.

Procedures

For three months, we tutored each child once or twice a week. We audio-recorded and sometimes video-recorded the tutoring events. We also took notes following each tutoring event and documented the students' writing samples.

A typical tutoring session using Scaffolded Writing began with the preparation of materials: blank paper, a yellow highlighter, an alphabet chart, markers for illustrating, and a pencil. The following procedures represent an

early or first Scaffolded Writing experience for a student.

1. Begin by asking the student to work with you. Ask what he would like to write about today. It needs to be one sentence. If it appears he needs help narrowing down his choices, give him some prompts. Ask him to share what he did over the weekend, something he is excited about, something he would like to tell someone, etc.
2. Count how many words are in the sentence. Use your fingers and have him count along using his. For example, his sentence is, "I played a baseball game." Count the words together, holding up a finger for each one: I (1) played (2) a (3) baseball (4) game (5).
3. "You have 5 words in your sentence. Watch me draw lines to show where we will write the words." Using the yellow highlighter, draw a line for each word at the bottom of the page. Draw longer lines for longer words, thinking aloud as you do so. "Hmm, the word 'baseball' has a lot of sounds in it. I may need to have more space for that word."
4. When all 5 lines are drawn, the student is ready to write with the pencil. Have him repeat the sentence to you before he begins. As he writes, stop after each word and read what is written so far.
5. If he needs help spelling a word, remind him to write the sounds he hears. You can implement the "rubber band" prompt, saying the word slowly and emphasizing each sound as you pull the air apart with your hands, imitating the stretch of a rubber band. Invented spelling is absolutely

acceptable and even desired during this process.

6. When he is done, read the sentence together. Read the sentence several times. He may illustrate his message in the blank space above the sentence.

These exact steps were repeated for several tutoring sessions. In later tutoring sessions, we asked the kindergartners to do more of the steps on their own, such as drawing their own lines to represent words. By expecting students to apply scaffolding steps (such as drawing lines) on their own, we were gradually releasing responsibility from teacher control to student control. The teacher lessens the amount of support given each time, until the student is able to complete the entire process independently. This looked different for each student; some moved to independent writing after four to five sessions, whereas other students needed sustained teacher support. Figure 1 depicts one early intervention sample and one later intervention sample from Boy 3.



Figure 1: One Early and One Later Intervention Sample from Boy 3

Evaluation

Initially, we assessed the children’s letter identification, phonemic/phonics awareness, and their writing complexity with three assessment measures from the Observation Survey of Early Literacy Achievement (Clay, 2013). According to the Reading Recovery Council of North America (2013): “The Observation Survey is a teacher-administered standardized assessment that adheres to characteristics of sound measurement instruments: standard tasks, standard administration, real-world task to establish validity, and ways of knowing about reliability of observations” (para. 2).

The Letter Identification tool simply measures a child’s accurate identification of uppercase and lowercase letters. The Hearing and Recording Sounds tool measures a child’s ability to hear sounds in words (phonemic awareness) and the ability to represent those sounds with letters (phonics). The Writing Vocabulary tool measures the quantity and quality of individual words a child can write independently. Following three months of tutoring, we assessed the kindergartners again with the same three assessment measures.

Findings

Overall, we found, that after three months of intervention, the children’s stanine scores on the three evaluation measures increased or remained constant (See Table 1).

Student	Letter I.D.		Hear/Record Sounds		Writing Vocabulary	
	Pre	Post	Pre	Post	Pre	Post
Boy 1	4	6	5	7	4	4
Girl 1	5	6	7	7	6	6
Boy 2	7	8	6	6	4	6
Girl 2	5	7	5	6	2	6
Boy 3	4	5	6	7	3	5

Research Question 1: How does the Scaffolded Writing teaching practice improve kindergarten writers’ letter identification?

The Letter Identification tool of the Observation Survey of Early Literacy (Clay, 2013) was an easy and quick assessment of the children’s abilities to identify individual letters (both uppercase and lowercase). Responses were counted correct if the child identified the letter’s name, or identified the letter’s sound, or identified a word that began with that letter. Figure 2 shows one child’s (Girl 2) pre- and post-record sheets from the Letter Identification assessment. Although no direct instruction of letter names took place during the Scaffolded Writing tutoring sessions, all five children increased in their abilities to identify letters. The largest increases took place for Boy 1 and Girl 2 as their scores increased by two stanines.

Figure 2: Pre- and Post- Letter Identification Record Forms for Girl 2

Table 1: Children’s Stanine Scores Pre- and Post-Intervention

Research Question 2: How does the Scaffolded Writing teaching practice improve kindergarten writers' phonemic and phonics awareness?

The ability to hear, classify, and manipulate sounds in our language is known as phonemic awareness (Cecil, Baker, and Lozano, 2015). Phonemic awareness precedes phonics applications. When children can identify and record the appropriate letters that make the sounds, they are advancing in their phonics skills.

The Hearing and Recording Sounds in Words evaluation instrument requires the child to listen to and record a dictated sentence. The child's work is scored by counting the child's correct representation of the sounds with letters (Clay, 2013). Because the Scaffolded Writing teaching practice encourages children to listen for and record the sounds they hear in words, we anticipated that we would see increases in stanine scores for the Hearing and Recording Sounds measure. Three of the children's scores increased from pre- to post-intervention by one or two stanines (See Table 1). It should be noted that the two children whose scores remained constant, had high abilities to hear and record sounds before intervention. Figure 3 depicts Girl 2's pre- and post-record sheets for the Hearing and Recording Sounds in Words evaluation measure.

Research Question 3: How does the Scaffolded Writing teaching practice improve kindergarten writers' quantity and quality of writing?

With the Writing Vocabulary early literacy assessment, the child is encouraged to write down all the words he knows how to write, starting with his own name and then moving

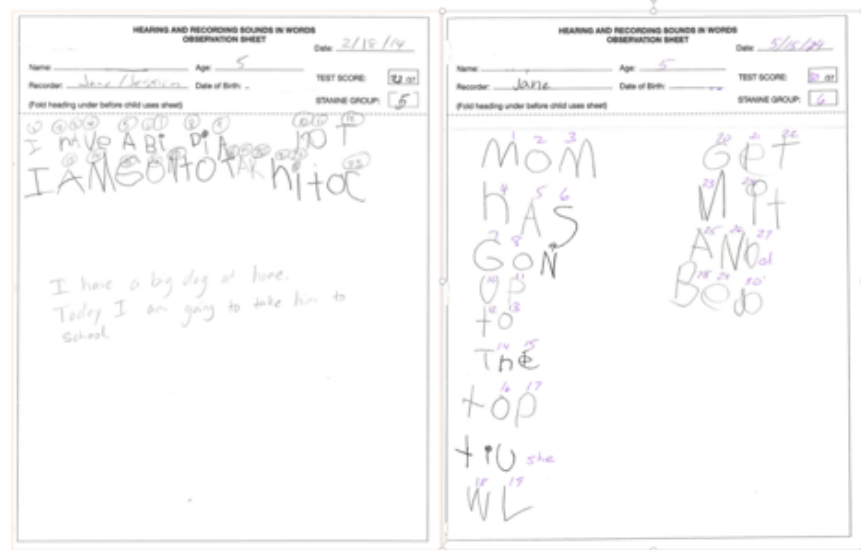


Figure 3: Pre- and Post- Hearing and Recording Sounds Forms for Girl 2

to a personal writing vocabulary list (Clay, 2013). Only words that are spelled correctly receive points. Clay described this simple test as reliable and “very sensitive to instructional procedures of the classroom” (p. 106). Higher stanine scores tend to be obtained from children in classrooms where early writing is fostered. Lower stanine scores tend to be associated with classrooms that provide few opportunities for children to write.

Because the children had received focused, individual writing instruction for three months, we anticipated increased stanine scores for the children on the Writing Vocabulary assessment. Two children's stanine scores remained constant from pre- to post-intervention. Three children's scores increased by two to four stanines. Perhaps most impressive was Girl 2's score increase from stanine 2 to stanine 6. Figures 4 and 5 depict Girl 2's pre- and post-record sheets for the Writing Vocabulary measure.

Figure 4: Pre-Writing Vocabulary Record Form for Girl 2

Figure 5: Post-Writing Vocabulary Record Form for Girl 2

Discussion

Jessica asked Girl 2, “What do you think you’d like to write about today?” Without hesitation, Girl 2 shouted “Wednesday my cousin Carly is going to come!” “Wow!” Jessica responded, “That’s a really great sentence. Let’s use our fingers and figure out how many words that is.” Girl 2 quickly counted on her fingers: “Wednesday my cousin Carly is going to come to play. Ten

Jessica responded, “That’s a really great sentence. Let’s use our fingers and figure out how many words that is.” Girl 2 quickly counted on her fingers: “Wednesday my cousin Carly is going to come to play. Ten words!” “Wow! Ten words! This is going to be a great sentence.” Jessica encouraged. Girl 2 confidently picked up the yellow highlighter and immediately began drawing short and long lines on the paper to represent her words. Then Girl 2 confidently and without hesitation wrote “Wensday” on the first line.

The above transcript/scenario was taken from a later tutoring session between our undergraduate student author and one of the kindergarten participants. Girl 2’s ease, confidence, and eagerness to write her message are clearly depicted. We feel certain that consistent implementation of the Scaffolded Writing teaching practice aided Girl 2’s writing fluency.

The participants’ identification of letters, letter sounds, and use of conventional spellings all increased or remained constant after three months of the Scaffolded Writing intervention. It is possible to attribute the participants’ academic growth to the general instruction taking place in the kindergarten classroom, and not to our interventions. Our observations of the children’s approaches to writing and their documented writing samples confirmed for us, however, that Scaffolded Writing definitely contributed to the students’ confidence and risk-taking while writing.

We understand that our multiple case study does not lend itself to generalizations beyond the five kindergartners that we worked with. In the future, we would like to expand our

our initial research and replicate Bodrova & Leong's (1995) study with equal numbers of kindergarten students in experimental and control groups. Such a study would provide more generalizable evidence of this teaching technique's effectiveness or ineffectiveness.

After completing this study, we were more convinced of the positive potential of this teaching practice. Scaffolded Writing guides young writers past scribbles and pictures to meaningful text. Scaffolded Writing is about taking the mystery out of the writing process. Figure 6 depicts some of our favorite writing samples.



Figure 6: Our Favorite Writing Samples

From left to right and top to bottom, the children's invented spelling in Figure 5 can be translated: "Grant will fight a dragon."; "I vomited last night." "We live in Tennessee. Me and my mom live in Tennessee." and "I like my new skateboard and I like to ride it." These samples demonstrate the participating kindergartners' progress in sentence structure variety, phonetic awareness, conventional spelling, word length variety, and perhaps most importantly, risk taking.

As early childhood educators, we are concerned with how we can help our young

students gain confidence and skills as writers. Our research confirms that the Scaffolded Writing practice has the potential to increase young writers' knowledge and skills in letter identification, phonetic awareness, and writing vocabulary. We also observed additional, indirect outcomes for our kindergarten participants including increased writing confidence and fluency. Completion of this study provided us with valuable experience in teaching and interacting with young children, as well as experience in conducting and presenting educational research.

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Fulfilling Their Fate: Roman Mythological Allusions and Organic Unity in *Romeo and Juliet*

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This essay interprets formal elements in William Shakespeare's *Romeo and Juliet*, to clarify and achieve a deeper understanding of the play's organic unity. While the ironic forbidden love between the children of the feuding Montague and Capulet families establishes the primary tension, the "star-cross'd lovers" (Shakespeare, Prologue line 6) ultimately resolve this tension by fulfilling their fated doom. Shakespeare's diction, figures of speech, metaphors, irony, foreshadowing, and most importantly Ovidian, Roman mythological allusions underpin the love/hate tension and support the play's resolution and unified meaning. I analyze the play's formal elements, all of which reinforce *Romeo and Juliet's* fate. Most notably, I examine certain mythological allusions in the play that illuminate the tragic tone and foreshadow the lovers' demise.

Existing scholarship has not sufficiently addressed the play's Roman allusions. Shakespeare's Ovidian allusions, specifically to the myths of Phaeton, Narcissus and Echo, and Pyramus and Thisbe, focus on tragedies and prophecies that foreshadow *Romeo and Juliet's* double suicide and strengthen the play's overall foreboding tone. The Phaeton references presage the lovers' demise and reflect the play's plot structure, while Narcissus and Echo's myth encapsulates both prophetic death and linguistic constraints endured by Echo and Juliet. Pyramus and Thisbe's myth closely parallels *Romeo and Juliet's* plight. Shakespeare's allusions create an objective correlative

explaining character motives and foreshadowing the fateful conclusion. This essay predominately focuses on these allusions, which are under-researched in current scholarship, to contribute to the contemporary critical discourse of *Romeo and Juliet*.

Understanding the play's Roman allusions and their contribution to its organic unity requires a brief look at the play's conflicts and tensions. Shakespeare's diction highlights these conflicts and tensions, which are inherent in poetic language (Bressler 60). The prologue overflows with word choices that establish an ambiguous tone to the play:

Two households, both alike in dignity,
In fair Verona, where we lay our scene,
From ancient grudge break to new mutiny,
Where civil blood makes civil hands unclean.
From forth the fatal loins of these two foes
A pair of star-cross'd lovers take their life . . .
(Prologue 1-6)

This passage suggests multiple meanings of the word *mutiny* (line 3), ranging from a "quarrel" ("Mutiny," def. 1), such as the one between the two families, to "an open revolt against constituted authority" ("Mutiny," def. 2b), which resembles *Romeo and Juliet's* rebellion against their parents' wishes. With deliberate literary ambiguity, the prologue not only hints that the Montagues' and Capulets' grudge has initiated a new feud, but also foreshadows *Romeo and Juliet's* fervor, which revolts against their parents' authority. The word *fatal* (line 5) also

has two relevant denotations: “allotted or decreed by a fate or destiny” (“Fatal,” def. 1), and “producing or resulting in death” (“Fatal,” def. 6a). The etymological root of *fatal* is *fate*, which is defined as “the principle power, or agency, by which . . . all events, or some events in particular, are unalterably predetermined from eternity” (“Fate”). Since the word *fatal* connotes both fate and death, it implies that Romeo and Juliet’s relationship is doomed from the beginning. This ambiguous diction foreshadows the events to come and introduces the play’s tone.

While the aforementioned diction employed in the prologue lends to the play’s tragic air, Shakespeare strategically uses misled communication that shifts the play’s comical tone to tragic. Throughout the play, miscommunication abounds primarily through missed letters and misinterpretations, such as Friar Lawrence’s missed letter to Romeo, and Benvolio’s misunderstanding of Juliet’s staged funeral, which he mistakenly communicates to Romeo. Gregory Heyworth discusses another pivotal scene between Romeo and a Capulet servant that not only encapsulates the comedic aspect but also highlights how “the sound and shape of letters can prove perilously alien to their denotations” (243).

SERVANT. I pray, sir, can you read?

ROMEO. Ay, mine own fortune in my misery.

SERVANT. Perhaps you have learn’d it without book. But I pray, can you read any thing you see?

ROMEO. Ay, if I know the letters and the language. (Shakespeare 1.2.56-60)

As Heyworth states, “Romeo is stubbornly figurative in his concept of reading, the Servant stubbornly literal” (244). The figurative-versus-literal dichotomy parallels the denotations and

connotations, as well as miscommunications, that support the play’s chief tension. As the play develops, the comedic aspect takes a tragic turn. Heyworth notes, “the game of language veers, under Shakespeare’s guidance, from ludic frivolity to mortal crisis” (246).

Shakespeare’s figures of speech moreover strengthen the overall form’s interrelatedness. The use of metaphor further develops the love/hate tension. When Juliet learns of Tybalt’s death and Romeo’s banishment, she describes Romeo as having a “serpent heart, hid with a flow’ring face . . .” and as a “Dove-feather’d raven! wolvish ravening lamb!” (Shakespeare 3.2.74, 76). Romeo’s opposing portrayals represent Juliet’s conflicted emotions: grieving both a cousin’s death and the consequences her husband will face. Likewise, the play’s abundant death personifications underscore the ambiance of fatality mentioned in the prologue. Shakespeare first personifies death as Juliet’s husband when she tells her Nurse, “I’ll to my wedding-bed, / And death, not Romeo, take my maidenhead!” (3.2.136-37). When Juliet’s father finds her apparently deceased, he tells Paris:

O son, the night before thy wedding-day
Hath Death lain with thy wife. There she lies,
Flower as she was, deflowered by him.
Death is my son-in-law, Death is my heir,
My daughter he has wedded. I will die,
And leave him all; life, living, all is Death’s.
(4.5.35-40)

These ironic personifications of death foreshadow the only resolution to Romeo and Juliet’s impossible marriage: the lovers’ deaths.

Irony, considered “New Criticism’s master trope because it is essential for the production of paradox and ambiguity” (Bressler 61),

additionally bolsters the play's contradictory nature. Juliet's metaphorical observance of Romeo, and Capulet's personifications of death in the passages quoted above are not only contradictory, but also imbued with irony. Juliet does not truly think Romeo has deceived her, and death cannot actually substitute for a living person. Because Shakespeare capitalizes the first letter of the word *Death* four times in these six lines, he not only stresses the irony by personifying Death as a living person, but also alludes to the Grim Reaper, a popular personification of death in the Middle Ages and in the Renaissance. Additionally, these death references intensify the foreshadowing of the lovers' demise, and ironically so, since the characters are yet unaware of the play's multiple casualties. Shakespeare also employs ironic missed communications between the two lovers, which ultimately leads to the play's most ironic moment: Juliet's mock death causing Romeo to kill himself, and thus Juliet to follow suit.

Close attention to Shakespeare's figures of speech reveals another metaphor that likewise foreshadows death as the resolution to Romeo and Juliet's love/hate tension. Friar Lawrence describes a poisonous flower, while also foreshadowing the lovers' deaths:

Within the infant rind of this weak flower
Poison hath residence and medicine power;
.....
Two such opposed kings encamp them still
In man as well as herbs, grace and rude will;
And where the worser is predominant,
Full soon the canker death eats up that plant.
(Shakespeare 2.2.23-24, 27-30)

This metaphor illustrates the play's ironic love/hate tension and foreshadows the dual purpose

the poisonous flower serves: mock death resulting in actual death. The overall tension of the play, that the lovers attempt to unite in the face of fateful and feuding opposition, resolves with their suicides.

Ovidian inspired Roman allusions reinforce this fulfillment of fate. These allusions act as an objective correlative, T. S. Eliot's term for a symbol that induces an emotional response from a reader by using certain situations instead of a direct statement of the emotion (Bressler 56). References to these well-known tragedies complement the play's foreboding, calamitous tone. Though Shakespeare's direct source for the play was the 1562 poem by Arthur Brooke, *The Tragical History of Romeus and Juliet* (Kermode 1101), Ovid's *Metamorphoses* also heavily influenced Shakespeare. As Robert Kilburn Root notes in his introduction to *Classical Mythology in Shakespeare*, "It was to Ovid that Shakespeare . . . turned for the classical allusions which the taste of the sixteenth century demanded in its literature" (Root 2). While twenty-five mythological allusions appear in the play, all but five occur in the first two acts (Root 9). This shift reflects the play's shift in tone: from the romantic encounters of the lovers in Acts 1 and 2 to the tragic events in Act 3, when Tybalt kills Mercutio, and Romeo kills Tybalt. When telling Benvolio of his love for Rosalind in Act 1, Romeo mentions Eros, stating, "Alas that love, whose view is muffled still, / Should, without eyes, see pathways to his will!" (Shakespeare 1.1.171-72). In mythology, Eros is the "boy god of love who was identified by the Romans with Cupid or Amor" ("Eros" 126). Eros's association with love reinforces the play's romantic theme. When in the aforementioned allusion Romeo speaks of the blindfolded Eros, he intimates his love for

Rosalind and implies that he is blinded by his emotions. Yet, Eros's Roman connotation with Cupid, who shoots his arrow, causing people to fall in love instantly, allows the allusion to foreshadow Romeo and Juliet's instantaneous love-at-first-sight interaction at the Capulet festivity. In the post-Freudian, modern understanding of Eros, Eros's association with Thanatos, the death instinct, also connects love with fatality, again bolstering the play's fateful tone.

While Eros allusions support the romantic theme, most of the play's allusions refer to tragedies and prophecies. Shakespeare's references to Phaeton, which heavily influence the play's plot structure, strongly link to Ovid's interpretation of the Phaeton myth. Phaeton, son of Phoebus, loses control while driving his father's chariot, forcing Zeus to strike him down with a thunderbolt. As Heyworth states,

Ovid's myth opens to spatio-temporal order: Phoebus's attendants, Day, Month, Year, Century and Hours, stand about his throne at equal distances . . . but Phaëthon's unruly transit soon disrupts that necessary distance both spatially and temporally In *Romeo and Juliet*, this hybrid solar motif measures dramatic time calibrated to the eccentric rhythm of romantic and tragic anxiety. (234)

Phaeton's swift descent from his joyous ride into tragedy parallels Romeo and Juliet's quick downward spiral from their nuptials to their suicides. Phaeton and Romeo similarly disregard their fathers' wishes and die trying to fulfill their own desires. While Capulet is extremely outspoken about his daughter's rejection of Paris, Montague only voices concern for his son. Montague tells Benvolio, "Could we but learn from whence his sorrows grow / We would as willingly give cure as

know" (Shakespeare 1.1.154-155). Montague's fatherly love mirrors that of Phoebus, who gives Phaeton the chariot's reins even though he knows its danger. Because Ovid's "Phaëton" is a story about fatherhood, the sun, and time, Montague's brief appearances act oppositely as "the imagery of an inverted solar cycle [which] stands out as a signal of the dysfunction inherent in Montague and Romeo's relationship" (Heyworth 239). Early in the morning, Juliet states, "Now is the sun upon the highmost hill / Of this day's journey . . ." (Shakespeare 2.5.9-10). As Jonathon Bate articulates, "from this point on, its motion—and with it that of the play—can only be downward like Phaëthon's" (Bate 177). While speaking of Romeo's anticipated arrival, Juliet pleads, "Gallop apace, you fiery-footed steeds, / Towards Phoebus' lodging; such a waggoner / As Phaeton would whip you to the west . . ." (Shakespeare 3.2.1-3). Here Shakespeare wraps the allusion in irony. As Bate notes, "The irony is that in willing on the night, she is willing on the tragedy, the moment of separation, Romeo's exile, and ultimately the confusion and mistiming which bring the death of both lovers" (Bate 177). The repeated Phaeton allusions are central to many of the play's elements: supporting the tragic tone, contributing to the irony, and foreshadowing the play's dramatic temporal shift into sudden tragedy.

Just as Romeo alluded to Echo in discussing his love for Rosalind, as shown above, Juliet alludes to Echo's myth while repeating Romeo's name in love. In Ovid's *Metamorphoses*, Echo is a nymph hopelessly in love with the god Narcissus, and she wastes away after his rejection. She only leaves behind the sound of her voice, which Juliet mimics in repetition.

After Romeo and Juliet's first encounter on the balcony, Juliet states, "Else would I tear the cave where Echo lies, / And make her airy tongue more hoarse than [mine] . . ." (Shakespeare 2.2.161-62). Bate points to the linguistic constraints endured by Echo and Juliet. While alluding to Echo, Juliet "alludes to her concomitant linguistic imprisonment at the end of the first balcony scene . . . But in the very act of speaking thus, she overcomes her bondage. Unlike the conventionally silent woman, she speaks aloud; and, as Echo cannot, she initiates a further dialogue with her beloved" (Bate 180). Echo's myth also invokes the myth of Narcissus, who meets a prophetic death like Romeo and Juliet's. In *Metamorphoses*, Nemesis approves a prayer by enemies of Narcissus that "So may he love—and never win his love!" (Ovid 3.405). While this prophecy leads to Narcissus falling in love with his reflection and his ultimate demise, it also resonates with Romeo's brief love for Juliet. Heyworth refers to the "Narcissus and Echo" allusion in comparison to Romeo and Juliet, stating, "the *Narcissus and Echo* myth acts as a model for a linguistic game of hide-and-seek gone awry: watching that begets hiding that begets calling. Romeo, like Narcissus evading pursuit, is the hider; Juliet, like Echo, is the caller . . ." (Heyworth 246). Echo's inability to speak more than repetitive words reflects the lovers' inability to communicate. As Heyworth notes, these miscommunications "grow out of a quibble over letters and grow into an increasingly desperate discontinuity between intention and expression, the literal and the figurative, fact and message" (246). As the Phaeton myth bolsters the play's tragic elements, Echo's myth strengthens the prophetic ones. Romeo and Juliet must fulfill their doomed destiny to resolve the play's tension, just as Narcissus and Echo are

destined to their own tragic demise.

In Act 2, Mercutio briefly lists a plethora of Roman allusions. Upon greeting Romeo, he states, "Dido [was] a dowdy, Cleopatra a gipsy, Helen and Hero hildings and harlots, Thisby a grey eye or so, but not to the purpose" (Shakespeare 2.4.38-43). Dido, mentioned in the *Metamorphoses* story "The Pilgrimage of Aeneas," is portrayed as having a "heart too ill-inured / To bear the parting from her Trojan spouse [Aeneas]. / Feigning a holy rite, she built a pyre / And fell upon his sword and, duped herself, / Duped all" (Ovid 14.83-87). Dido's suicide by her lover's sword mirrors Juliet's demise in Shakespeare's play. *Metamorphoses* briefly mentions Helen, her kidnapping by Paris sparking war in Book XII. While Paris and Romeo share similar fates pursuing their loves, Shakespeare's allusion to the Ovidian Paris relates to Count Paris, adapted from the source poem by Brooke, who also dies in pursuit of Juliet. Though Mercutio's allusion to Hero does not appear in Ovid's mythological narrative, Hero's story is found in another famous Ovidian work, *Double Heroïdes*. Dido, Helen, and Hero all make appearances in Ovid's epistolary poems in *Heroïdes*, and its follow-up, *Double Heroïdes*, which takes the form of a collection of letters written by distressed heroines and absentee heroes from Greek and Roman mythology. The allusions to these tragic lovers' correspondence mirror the tragedy of Romeo and Juliet's misled communication. The allusion to Thisbe resonates with the entire premise of *Romeo and Juliet*. According to Ovid's interpretation, Thisbe has a forbidden relationship with her lover Pyramus that ends in joint suicides. Pyramus and Thisbe share with Romeo and Juliet the parental ban of their love, similar meetings in tombs, and suicides caused

by temporal miscommunication.

Because the particular Ovidian allusions employed derive from ancient Rome, they additionally reflect the play's Italian location, Verona. Paulina Kewes notes, "The history and literature of Ancient Rome pervaded the thought and imagination of Elizabethan England . . . Lessons of Roman history were a shaping influence on Elizabethan thinking about issues that were central to the age . . ." (515). For the Elizabethan playgoer, Rome would connote Italy. Deepening this allusion is the consideration of Romeo's name as a derivation of *Rome*, which the Elizabethan audience would have associated with Italy (Tutino 738). As Robert C. Jones states, "Italy offered not only a frequent setting but a constant source of allusion with which poets more interested in the resources of allusion than in those of a regional setting could charge their tragic scenes" (268). The significance of these Roman allusions, acting as an objective correlative, bolsters the play's tone effectively due to the audience's familiarity with Rome and Italy.

In conclusion, *The Tragedy of Romeo and Juliet's* central feud between the Montague and Capulet houses is overshadowed by the love of their children, Romeo and Juliet. The ironic forbidden love between the children of the feuding families becomes the play's primary tension. Because Romeo and Juliet fulfill the fated doom of the "star-cross'd lovers" (Shakespeare, Prologue 6), the play concludes with their deaths and the dissolution of the Montague and Capulet quarrel. Consequently, the tension between love and hate resolves, giving the poem organic unity. After closer observation of Shakespeare's diction, metaphor, irony, paradox and most significantly Ovidian,

Roman allusions, a seemingly paradoxical work of art fuses together. When Prince Escalus gathers the families together after Romeo and Juliet's suicides, Shakespeare uses this moment as a reflection on the play's ultimate paradox:

See what a scourge is laid upon your hate,
That heaven finds means to kill your joys with love,
And I for winking at your discords too
Have lost a brace of kinsmen. All are punish'd.
(Shakespeare 5.3.291-95)

The fundamental resolution of the love/hate tension requires the lovers to die. Romeo and Juliet's deaths also terminate the Montague and Capulet feud, and, as Heyworth notes, "the final scene returns us full circle to the feud of the prologue, putting an end at last to 'the continuance of their parent's rage'" (10). This too means an end to the Montague and Capulet lineages; as Heywood states, "Peaceful closure may have replaced the continuance of strife, but it's brought with the sacrifice of a greater flesh-and-blood continuity" (238). The resolution also ultimately fulfills the fate of the "star-cross'd lovers" foreshadowed throughout the poem. Yet, the ill-fated Ovidian Roman allusions stand as the most significant technique in supporting the chief paradox or the primary tension. Shakespeare takes full advantage of the allusions as an objective correlative, evoking emotion from the Elizabethan audience, while also contributing to the overall foreboding, tragic tone. With the tragedies of *Echo*, *Dido*, *Helen*, and *Hero*, the prophecy of *Narcissus*, *Phaeton's* disastrous journey, and the familiar doomed parallels of *Pyramus and Thisbe*, resolving the love-hate tension of *Romeo and Juliet* requires analysis of the play's allusions to the Ovidian stories of love and death that resonate profoundly throughout literary history and give the play organic unity.

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Faulkner's Elderly Ladies

Saylah Johnson

Each of William Faulkner's characters, as any Faulkner scholar can attest, is comprised of numerous complexities, including their personalities and internal conflicts, their significance in relation to the plot, and the literary value of their actions. These characters, of course, fall on a spectrum between "good" and "evil," with many actively participating in conflict formation. However, one seemingly innocent demographic in particular—that of elderly ladies—often *passively* or *cunningly* participates in conflict formation, serving as the main source of conflict in a story. In "A Rose for Emily," "The Brooch," and "Elly," Faulkner's elderly ladies help lead other characters to their demise or at least a profound transformation, acting as catalysts that push their respective stories to grim ends—not necessarily because they are inherently evil, but because of their inability to accept the changes taking place around them. These women, imposing and defiant, perfectly demonstrate the concept of "disruptive femininity," which Deborah Clarke mentions in *Robbing the Mother*: "Not even age and menopause necessarily render a woman less threatening," she says. "The only safe woman is a dead woman" (6).

One of Faulkner's most famous short stories, "A Rose for Emily," features Miss Emily Grierson, whom the community of Jefferson considers "a tradition, a duty, and a care; a sort of hereditary obligation upon the town" (119). They believe her bizarre, and rightly so; she looms over the town, a symbol of stagnancy, refusing to conform to or participate in the changing society. This refusal (or inability) to accept change is one of the main conflicts of the work; every other conflict stems from it.

However, this deficiency comes about not as a result of something inherent in Emily's nature but instead as a result of Emily's father's excessively strict presence in her life. Never having had the opportunity to develop any meaningful relationships due to this oppressive paternal figure—and thus never really knowing *how*—Emily reacts to loss by clinging to the remnants of what she once had—or what she fears losing. Reflecting on the past, the narrative voice of the townsfolk mentions feeling sorrow for Emily as well as the community's belief that she would kill herself after Homer Barron supposedly leaves her, which builds suspense for the impending revelation. Despite the bothersome stench surrounding her old house, the other residents of Jefferson do not suspect murder. They agree upon the idea of Emily's otherness, but they do not immediately deem her capable of such a sinister act. And perhaps this act was in fact one of desperation rather than evil. Emily's inability to accept that the past is gone drives her to perform these grim tasks; her father's strict and unfair parenting methods stunted her, injuring her mental health and development and leading her unintentionally to these evil actions. When Emily asks for the rat poison at the drug store, a considerable wickedness radiates from her:

The druggist looked down at her. She looked back at him, erect, her face like a strained flag. "Why, of course," the druggist said. "If that's what you want. But the law requires you to tell what you are going to use it for."

Miss Emily just stared at him, her head tilted back in order to look him eye for eye, until he looked away and went and got the arsenic and wrapped it up. The Negro delivery boy brought her the package; the druggist didn't come back. When she opened the package at home there was written on the box, under the skull and bones: "For rats." (126)

This pivotal point in the story sets the stage for the impending act of evil. The community

presumes that Emily will kill herself with the poison, saying that “it would be the best thing” (126). However, considering the stench mentioned earlier on in the story, the reader delays making any concrete conclusions. Emily—the last of her breed—simply cannot accept time’s passing and the change that accompanies it. This fault brings about the act that forever scars the city of Jefferson. After Miss Emily’s death, the community men break into one of her rooms, making the baffling discovery that the decomposed body of Homer Barron, who had not been seen in decades, lay upon the bed—from which he had become “inextricable” (130). Perhaps even more shocking than the corpse itself, however, is the single strand of gray hair that lay upon the second pillow; here, the true extent of Emily’s mental illness is revealed. By killing Homer and continuing to live with and even sleep next to his dead body, she believes that she can preserve a portion of her past. Here, Thomas Dilworth makes an important observation about Emily’s relationship with Homer in regards to the town:

By entering a love affair with Homer Barron, Emily briefly rebelled against Southern values and then, by ending her affair with him, at least as far as the townspeople were concerned, she conformed again to those values. She killed Homer largely to placate society, although that, in her deranged mind, also secured him as her lover forever. (251)

In engaging in a romantic relationship with Homer—a northerner—Emily seems to reject an aspect of the old status quo that she had so vehemently clung to. Perhaps in killing this lover—and thus in a way preserving their relationship for eternity—she is able to reconcile her desire for love with the townsfolk’s expectations. In the end, though, not only does Emily Grierson prevent the complete transformation of Jefferson from old to new, but she also commits a murder—all because she could not accept the change that comes with the passage of time. This attempt to appease

the townspeople, of course, does nothing but further outcast her, marking her as a malignancy to the city of Jefferson, her sinister deed forever lingering in the city’s history and collective memory.

Howard Boyd’s mother in “The Brooch” is an example of an almost vampiric old lady whose inability to accept her son’s independence imposes on several aspects of his life, rendering his days devoid of any happiness. She has metaphorically attached herself to him like a parasite in an attempt to preserve her status as the primary female in his life. Faulkner even writes that “When [Howard] went away to college she went with him [. . .] she kept a house in Charlottesville, Virginia, for four years while he graduated” (“Brooch” 647). Unlike Emily, in order to inflict damage, she need not even lift a finger. She does not inflict any physical harm or directly cause any deaths; she simply controls Howard’s life from her bedroom, as if her very existence oppresses his. Howard and his wife, Amy, cannot live freely in his mother’s domain; they must work their secret schedules around the light of her transom. However, as the narrator states, “she heard everything that happened at any hour in the house” (647). Howard’s mother cannot be fooled; she is all-knowing and all-powerful despite her invalidity. She controls Howard in the same way a vampire controls its victim; she will not let him detach himself from her. His blood comes from her blood—she need not taste it, for the connection is already present. He refuses to stray from her side, creating tension in his marriage; it is as if his mother has cursed them. Amy attempts to persuade Howard to leave his mother behind so they can start a life of their own, but Howard declines, saying that his mother will not live forever. To this Amy replies, “Yes, she will. She’ll live forever, just to hate me” (652). Soon afterwards, their child dies. Could this death result from Howard’s mother’s rejection of her son’s marriage? Did she really

curse them? Howard's mother destroys his relationship with Amy in an intriguing way: she seemingly uses the brooch she gave Amy as a sort of tracking device, sensing when Amy is near or far and even sensing when Amy has lost the brooch. Howard tries desperately to keep this secret from his mother and convince her that Amy is not out doing anything disagreeable:

"So you swear she is in this house this minute."

"Yes. Of course she is. She's asleep, I tell you."

"Then send her down here to say good night to me."

"Nonsense. Of course I won't."

They looked at one another across the bed's footboard. "You refuse?"

"Yes."

They looked at one another a moment longer.

Then he began to turn away; he could feel her watching him. "Then tell me something else. It was the brooch she lost." (656)

In the above passage, Howard's mother takes on a particularly dark tone; she displays elevated intuition in a manner that seems supernatural. Throughout the story, Amy, the "intruder," threatens this parasitic bond between mother and son, and Howard's mother uses the brooch to catch Amy in the middle of a lie, giving her a reason to kick Amy out of her house without making the fact that she has control—or at least partial control—of Howard's actions expressly obvious. Soon after Amy leaves, though, Howard prepares to kill himself, taking care not to make too much noise or mess—but did Howard commit suicide by his own free will to escape his mother's control, or did his mother drive him to it as punishment for lying? In this story, as in "A Rose for Emily," the dangerous elderly lady causes a conflict that cannot be resolved—an untimely and unfortunate death.

In Faulkner's "Elly," Elly's grandmother, much like Miss Emily Grierson, creates conflict by

trying to preserve old and outdated values. Elly's grandmother, Ailanthia, coldly and quietly judges her granddaughter for her promiscuous lifestyle—perhaps out of love, perhaps simple contempt. The narrator mentions that after her almost nightly meetings with different men, Elly would often encounter Ailanthia as she passed by her room:

Wearily now, with the tread almost of an old woman, [Elly] would mount the stairs and pass the open door of the lighted room where her grandmother sat, erect [. . .] Usually she did not look into the room when she passed. But now and then she did. Then for an instant they would look full at one another: the old woman cold, piercing; the girl weary, spent, her face, her dark dilated eyes, filled with impotent hatred. (Faulkner, "Elly" 208-09)

Here, the comparison of Elly's gait to that of an old woman suggests an interesting connection; in "Double Murder: The Women of Faulkner's 'Elly,'" Alice Hall Perry proposes that Elly and her grandmother Ailanthia are Doppelgängers. "As with most literary doubles," she says, "they share much: the same name, the same home, even the same capacity to fix each other visually" (222). Perhaps in attempting to preserve her own personal morals in her granddaughter, Ailanthia hopes to simultaneously retain her own honor through her double, Elly. Her quiet threats to tell Elly's father about her adventures with Paul, fueled by her racist views, comprise the main conflict between her and her granddaughter. According to Wen-ching Ho, "to the cold, implacable grandmother, Elly's illicit liaison with Paul is indeed a cause for fear, for it violates the Southern code" (8). This code constitutes the driving force behind Ailanthia's desires to prevent Elly from being promiscuous, especially with someone of mixed race like Paul; her shock and contempt upon even hearing Paul's name causes her to "start violently backward as a snake does to strike" (Faulkner, "Elly" 211).

Elly believes that marrying Paul would at the very least improve this conflict; however, Paul refuses her marriage proposal. Unable to handle her grandmother's looming threat, Elly ends up killing Ailanthia and Paul in the car on the way home from Mills City. Even though she ends up without her lover, she succeeds in destroying her double, freeing herself from the old lady's constraints and making an identity for herself. In this story, contrary to the others, the dangerous old lady faces defeat; however, her death brings nearly as much destruction as it does freedom.

These three ladies, despite their age, are formidable antagonists who hold the power to shape the plots of their stories in unforgettable ways—in these cases, through murder, vampirism, and blackmail. Faulkner's elderly women are no ordinary characters; they are cunning, dangerous, and effective, creating unique forms of conflict and dismissing the myth of the helpless, harmless old lady. Though they may not always walk away successful or victorious, they must not be underestimated, as they often are; underestimation only renders them more powerful and dangerous. In their vehement rejection of the changes taking place around them, Miss Emily, Howard's mother, and Ailanthia end up shaking Yoknapatawpha County's very roots and challenging the society that they live in as well as everyone around them, forcing them to think of change, of life, of impermanence. After all, change is imminent and nothing lasts forever—especially not youth.

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Three Christmases

Shannon Buford

Allow me to warm your heart with holiday tales of overpriced toys, disappointed youngsters, and dying dogs.



Joy to the World, I Got Great Stuff

Most civilized humans measure the passage of time by days and months and years.

Children—and maybe some people who are saddled with the arduous task of catering to their whims—tend to relate every godforsaken day to its proximity to Christmas. I was very guilty of doing this as a child.

My Christmas lists started in February and grew and grew until mid-December, with continuous revision and reorganization in between. Santa, my parents, and any other adults who might care to know what commercials or store displays had most recently swayed me needed to know whether a karaoke machine or a copy of *Super Smash Bros. Melee* was a higher priority on my list, so it was my job to keep them abreast of any developments.

I was raised without religion, but I had enough awareness of Christianity to gather that if I closed my eyes, clasped my hands together, and made a wish, a man I couldn't see would hear me and grant my wish. Evidently I had not heard or had ignored the message of eternal salvation, because I thought the man upstairs was Santa Claus. My red-suited savior was the sounding board for all of my dreams and desires.

“Santa, please help me become a famous singer.”

“Please give us a snow day, Santa.”

“I wish the library had more *Dear America* books. Can you get them for me, Santa?”

And so I had plenty of one-sided conversations with Santa, with the idea in mind that he saw me when I was sleeping, knew when I was awake, knew if I'd been bad or good – but rather than looking for an excuse to save a few bucks by giving me coal, I believed that he loved me and rejoiced in my good deeds and lamented over (but forgave) my bad deeds. My Christmas lists were of course a more formal affair than my wish-prayers. I imagined he read them with the air of someone receiving a letter from an old friend, smiling at a particularly well-composed section of my list, perhaps calling a few elves over to look. “Hey, it's from [AUTHOR] in Tennessee!” Yes, despite being a bubble-headed imp, I was at the very least aware that there were other children on Santa's radar.

The best Christmas was when I was seven years old. My heart was set on getting a Felicity doll. For those of you who did not spend your childhoods perusing *American Girl* catalogs, Felicity is a doll who is the star of several books written to engage children in the history of colonial America (and encourage them to ask for hundreds of dollars' worth of doll clothing, furniture, and accessories. To their credit, my parents did not fall for this.).

On Christmas morning, I was thrilled to see her in a box in front of the fireplace. (Presents that were unwrapped, such as Felicity, were from Santa Claus, while wrapped presents were from family.) I hugged her and carried her with me all day. Most of the time after that, she sat on my window seat.

I'm twenty years old now, and she never crosses my mind except on the rare occasions when I see her in the hard-to-reach depths of my

clockwork, I think of her and bring her downstairs to sit beside me while I celebrate Christmas with my family. I'm not sure why I do it. Habit? Sentimentality? A commitment to tradition? I try to play it off as a casual thing. "Yup, I'll be right down, just gotta grab Felicity."



Deck the Halls with Disillusion

Being an only child, I had no mean brother or sister to crush my spirit. Instead I had to ask my parents to do it for me. I had actually heard the truth before – many times, in fact, from other kids and even a substitute teacher. Stubborn as I was, I refused to believe it until I damn well pleased. One day I must have decided that I was ready, because I went to ask my parents for the scoop.

That's how I found myself learning at the ripe old age of ten that there was no such thing as Santa Claus.

"You mean you guys bought me everything that I've ever gotten for Christmas?"

"Yup, besides your gifts from the rest of the family and your friends."

"The GameCube and the karaoke machine and Felicity? You guys bought me all that stuff?"

"We sure did."

"Wow. That must have cost you guys a lot of money. Thank you so much!"

"You're welcome, honey. I'm sorry. I wish he were real, too."

"That's okay. Thanks for telling me. So who ate all the Christmas cookies?"

"Dad. Sometimes the dogs helped. Buddy really likes the chocolate chip ones."

I chuckled. "Oh. Who wrote the notes that he left?"

"I did that. I tried to change it a little so you wouldn't notice."

"I-I remember thinking his handwriting looked like yours but not quite the same and how cool that was. I should have known. But I really believed. I really, really believed."

"You did! I'm so glad. You were lucky to have so many years where you still believed. It's made it so special."

Humiliation would be a natural reaction to having something so significant and, frankly, obvious revealed at such a late stage of childhood. I was – am – a little humiliated by it.

It gave me a minor epiphany. In the most extreme case of irony imaginable, I had never understood how other kids could believe in God without any tangible evidence. It seemed like a pleasant illusion, sure, but what were the chances of it being real? They believed in God because their parents told them He was real; I believed in Santa because my parents told me he was real. All of this dawned on me when I learned the truth about Santa Claus. It didn't make me believe in God any more or less, but I was glad to have a little more understanding of other people.

On the other hand, I could have figured that out another way. What would have been better was to enjoy some Christmas cookies that didn't taste like bitter disappointment. The first Christmas after I became initiated was very disenchanting. Of course, I quickly learned to cope, but a small part of me can't help but wish I never learned the truth. Hiding it from me could have been a grand conspiracy. My parents could have planned on telling my future husband to just hide it from me as he hid it from our children. A foolproof plan.



I'll Be Dead By Christmas (If Only in My Dreams)

One night about a week before Christmas in 2014, my parents and I were riding through my small hometown, sitting in the backseat of my parents' car as we viewed Christmas lights. Seeing all the beautiful shimmering colors and the kitschy snowmen and reindeer as Christmas CDs played through the stereo has always been one of my favorite traditions. My dad had to get as drunk as the proverbial skunk to endure any holiday songs, but otherwise we painted a rather idyllic picture.

What was less idyllic was the intense nausea that set in halfway through our outing that night. Not wanting myself or anyone else to miss the lights, I powered through. I assumed it was carsickness, though I had rarely experienced it before. About ten minutes after we arrived back home, I was puking my guts out. This marked the beginning of my first (thankfully only, knock on wood) experience with the flu. After that I became a near-permanent fixture on the couch. My entire body ached; I had fever and chills. I was dizzy and threw up constantly.

I've always been called an easygoing person. I see the glass as half full – even halfway to overflowing – and have been told I can be gratefully positive. None of these qualities was visible in me at that point. I relished the moments when someone would ask how I was doing so I could bitch and moan about my plight. (Surprisingly, they continued to inquire about me. I guess that's love.) Sure, I knew it wasn't the end of the world (although part of me wanted it to be), but I was bored and pissed about being bedridden. It was more of a sport to entertain me in idleness than anything else.

Soon, however, someone else's pain distracted me from my own. The health of my dog, CJ, seemed to be waning. This was not exactly a surprise; the Maltipoo (Maltese/Poodle, for those who are uninitiated in the ways of mini mutts) was roughly eighteen years old and had been through a lot, including being abused by her original owners and being inadvertently run over by my dad's car two years prior (the day after Christmas, no less). She was sleeping more and having trouble getting up. These problems had come and gone for the past few years, so I tried not to worry too much. Sometimes she was weak one day and the next day she was twirling in circles and wagging her tail. But whether or not this was the end, she was clearly suffering.

The only thing besides a full bladder that could consistently get me out of bed was CJ. I would pry myself off the couch and stagger into her room to rub her back, kiss her head, and tell her that I loved her. Though I hadn't been to church in a while, I prayed for her, this time sending my prayers to heaven instead of the North Pole.

She got worse. Finally, she couldn't eat and wasn't going to the bathroom. For the first time, she was crying out in pain. Her big brown eyes had even grown dull. We knew it was our duty as her guardians to end her pain. On the morning of Christmas Eve, my mom and I woke up early to take her to the vet's office as soon as it opened. We picked her up and wrapped her in a blanket; I held her swaddled form as my mom drove us to the place that makes dogs tremble. CJ felt too light in my arms and she couldn't stop whimpering. I stroked her fur as Mom and I said soothing things to her.

After what seemed like a long ride but in reality took about fifteen minutes, we arrived at the vet's office. We checked in with the receptionist

and, as unpracticed as I had become in the arts of standing and walking, I had to pass CJ off to my mom and find a seat in the waiting area. It was a modern and attractive building with lots of light shining in from large windows. I'm surprised that I remember, because our minds were occupied with comforting her through her cries. I also remember that two or three dogs entered while we waited. They were much younger than CJ and full of life. Seeing them made me smile through my tears even as the sight filled me with a strange jealousy.

Mom asked, "Do you want to wait out here or would you rather come with me and see it happen?"

I took a deep breath. "I want to see it. I think it would make me feel better. Well, a little better."

"All right, I think that's a good idea. I bet it'll help."

"CJ?" An employee was calling out the next patient's name. It was our turn. We got up, CJ still wrapped in a blanket in my mom's arms.

It was almost impossible to believe that we were about to lose her, though the last thing we wanted was for her to suffer any longer. I was eighteen then, just like she was, and she had been in our family since I was four. I could scarcely remember a time without her.

We entered a small room and the woman assisting the vet told us she was sorry. After examining CJ and administering some pain medication, she left us alone to say goodbye to our dog.

Somehow my mom managed to hold back tears while I was a sobbing mess. We both kissed her and petted her and declared our love for her. The gist of what we said was:

"We love you, CJ. You're the sweetest girl in the world. You'll be in a happy place soon where you

can run and play again. We'll miss you more than anything, but it's all going to be okay for you soon."

I had finally gained some semblance of composure when the vet and her assistant entered. They were very kind to all three of us, petting CJ before the vet told us she was ready. Two of my dogs before CJ had been put to sleep, but I had never witnessed the process. I hoped that it would provide the quick and peaceful parting I imagined.

The vet inserted a needle into CJ's arm. Without a sound, she closed her eyes.

"She's gone," the vet said gently.

My heart lurched at such a terrible thought as I released a breath I hadn't noticed I was holding. I had just watched her die, and somehow, mingled with my heartbreak and disbelief was relief. Her pain was finally over. I had never seen a creature look so serene. I had the possibly insane thought that it was a beautiful sight – terrible, but still beautiful.

Needless to say, I didn't have a very merry Christmas. I returned to the couch, adding "I miss CJ" to my list of things to whine about. This particular complaint was shared by my parents, which is probably why they decided not to murder me for it.

It was so much like a dark joke that I had to chuckle. I had dragged myself out of the house for the first time in days to go put my dog down on Christmas Eve. Ever since then, if anyone in my family gets stressed around the holidays or laments their inability to find the Christmas spirit, he or she is met with a wry, "Well, at least we didn't have to put our dog down on Christmas Eve."



I still love Christmas.