



Sabiduría

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Introduction

Dear Readers,

On behalf of The Dr. Floyd F. Koch Honor's College, we are pleased to present to you the Sabiduría Spring 2020, Volume 10, Issue 1, undergraduate academic journal. In this edition, we were thrilled to see more creative works than in years before. The Sabiduría team alongside Honors Faculty Advisor for Sabiduría, Professor Robin Fiedler have complied research papers, literary works, and artworks together to form this year's publication.

Many Honors College Students submitted their best works with the intention of being part of this academic journal, but not all were selected. The exceptional published works within this academic journal underwent a thorough evaluation and met the publication's expectations to the highest degree. The screening process could not have been completed without the help of fellow Honors College Students who volunteered as readers for the submitted works.

The Sabiduría Spring 2020 team would like to sincerely thank Associate Professor Robin Fiedler and Honors College Manager Marcella Montesinos for their tireless work and effort on this edition of Sabiduría. This academic journal is made possible through their help and support. A special thank you also goes out to Dr. David Pena for his assistance in the undertaking of the publication process of this academic journal.

Sincerely,

Marie Aramouni and Rachael Hobbs, Editors

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Cover Art by Professor Sherry Stephens' Honors Art Appreciation Class Spring 2020

The gray upper left by Kaili Sherman.
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Untitled Artwork by Kaili Sherman

Robots: Replacing or Collaborating with Humans? by Marie Aramouni*

Abstract

This research emphasizes the effects of human interaction with artificial intelligence in relevance to how humans associate themselves with robots, work with, and tolerate robots in the 21st century and further into the future. Robots can be used for multiple purposes, including assisting humans in simplistic activities or elaborate tasks. The programming of robots will affect the way humans interact with them. Additionally, the different definitions of machine learning, deep learning, and artificial intelligence are discussed. Moreover, the use of robots on Mars is investigated, and the findings that rovers have accumulated regarding the application they offer humans. This paper examines the likelihood of sex robots becoming more common in the future and the outcomes predicted on humanity. Furthermore, humans' responses to robots, the functionality/characteristics robots will have, and robots' implications on civilization and the effects of robot companions will be discussed. Robots are also mentioned when discussing gathering information for current and forthcoming expeditions to Mars. This paper concludes with a general outlook into the future of robots in society and the significance they offer on humanity.

Introduction

Robots have been around since the 1960s, when Joseph Engleberger modified a robot patent and turned it into an industrial robot to form a company called Unimation to produce and market the robots. Due to his efforts and accomplishments, Engleberger is known in the industry as “the Father of Robotics” (Roberts, n.d.). Engleberger and others' original intention for robots has changed to independently carrying out jobs instead of assisting in completing them. Robots are performing service jobs since they can carry out activities more efficiently than humans. There is a common misconception that robots will take over in the work field due to their abilities. Conversely, robots working along with humans saves time, allows for accuracy, and a better division of skills. Robots can complete tasks ranging from high in difficulty to minimal. They can be used for assistance in going to Mars or for being companions. The programming of robots, the willingness to accept them, and how they will be used will affect how they are portrayed in society.

Robots in Society

The term “Robot” was first introduced around the mid-20th century. Since then, the definition of a robot changed from a humanoid artificial being to any embodied

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artificial being (Danaher & McArthur, 2017, p. 4). The current definition in the *Oxford English Dictionary* defines a robot as "an intelligent artificial being typically made of metal and resembling a human or other animal." Robots can be found in factories manufacturing, working alongside humans on job sites, and delivering packages. They can also make humans' lives easier, offering advanced technology in society, and contributing to automatization. Robots differ depending on their application for handling processes; machine learning and deep learning describe how a machine can interpret information.

Machine learning is a machine that can learn either from pre-existing knowledge or through identification, whereas deep learning compares data for a concise interpretation of the results. Two approaches occur in machine learning, including top-down and bottom-up. The top-down approach consists of guessing pre-existing knowledge, and the bottom-up approach identifies raw sensory information (Gopnik, 2017, para.12). Machine learning is a sub-branch of artificial intelligence; it allows humans to train computers without specific programming. Machine learning gives computers the new ability or **pattern recognition** ("Artificial," 2019, para.6). Furthermore, deep learning is a component of machine learning; it fastens the process by allowing the data results to be considered to well-researched decisions regarding comparable data. The pattern recognition progresses into practically an extensive algorithm. Through machine learning and deep learning, computers can be trained to identify repetitive behavior.

The intelligence that is displayed by machines is referred to as machine intelligence or artificial intelligence. Machine learning by itself through trial and error is considered artificial intelligence. Research done about artificial intelligence concentrates on advancing and interruption of algorithms that learn or possess intelligent behavior with slight human intervention. Artificial general intelligence focuses on having machines perform any intellectual task that a human being could carry out. Artificial intelligence in robots allows for improved use of their abilities within society ("Artificial," 2019, para.1-4). Through the use of artificial intelligence, robots would understand how they should execute situations based on their prior experiences.

Humans Reactions to Robots

Humans have various responses to robots concerning being willing to accept them in society, despite the fear of overpowering that humans might have of them. Smart machines are supporting humans to enlarge their abilities in numerous ways. "AI can amplify the cognitive strengths of humans; it can also interact with customers and employees to allow humans the time to perform higher-level tasks, and embody human skills to extend our physical capabilities" (Wilson & Daugherty, 2018, p. 118). Artificial intelligence can increase humans' analytical and decision-making abilities by providing the exact information at the precise time. Automation has globalized with artificial intelligence providing an advanced systematic way of progression with slight human assistance. The spread of automation could also make workers more productive and efficient, causing economic growth and global improvement of overall pay.

Engineering Robots

Scientists are designing robots to resemble humans in the 21st century. Robots given human-like features are one reason some humans fear them and see them as a threat to humanity. A poll conducted in 2018 by the Pew Research Center shows that within several countries around the world, "a large majority of people believe it is most likely that robots will be doing much of the work done by humans within 50 years" (Taylor, 2018, para.1). The polls were conducted in Argentina, Brazil, Canada, Greece, Hungary, Italy, Japan, Poland, and South Africa. The poll results found that most countries agree that robots would soon do humans' work, with only limited differences in their views of how robots replacing humans would affect society despite some countries being advanced economically and others still developing. In contrast to human perceptions, robots will be far more efficient than humans are, regarding memory, and the ability to carry out high-speed calculations (Dumouchel, Damiano & DeBevoise, 2017, p. 89). The way robots are programmed will affect the way humans choose to communicate with them. If robots do not tolerate working humans, the same will be reciprocated by humans to robots. Programmers do not want a robot to behave randomly, but a certain level of indeterminability could have a positive effect on engagement purposes. The programmer does not anticipate robots' responses to questions or other inputs; there is no fixed response being assigned to each input (Kirk, 2017, p. 28). The software being used will ensure that the system constructs its response based on its arrangement of the input. Additionally, ethicists generalize that robots will not have free will. A respectable reason does not exist why robots should not have free will, since no plausible arguments show that free will is essential for intelligence or consciousness. Overall, programmers have the authority to program robots how they choose for their intent on how the robots should and can be used. Not all programmers have good intentions for the programming of robots; therefore, not all should be trusted.

The dilemma engineers are having as of the 21st century is deciding how involved we as humans want robots to be in society. Researchers are working to enable robots to express emotions by changing the pitch of its machine voice and using dozens to hundreds of tiny motors to control the synthetic facial muscles (Fung, 2016, para.12). Robots possessing advanced machine intelligence and emotions differentiate them between electronic appliances. Robots can be smarter, more reliable, and faster than humans in certain areas. The question arises on whether they should also feel how humans feel; "Machines are programmed to learn large amounts of real-world examples of stimuli-responses" (Fung, 2016, para.8). For instance, a robot cannot answer a question that asks about how it feels or what interests them; however, based on previous questions, they can predict what is logical for them to answer regarding the circumstances at hand. Therefore, robots will respond logically and learn from their own previous mistakes or experiences, but they will not feel "real" emotion towards the job they are doing. In other words, robots are mindlessly working for hours. In a sense, artificial intelligence is aware since robots adjust to new inputs based on historical data and use algorithms to respond to specific actions.

Robots Effect on Society

Robots will have the ability to assist humans in day-to-day activities, neglect human intelligence while increasing creativity, and serve as human companions soon. The challenge designers are faced with is creating robots that will interact with people in homes, hospitals, schools, and workplaces. For robots to be capable of interacting in public, “designers will need to draw from psychological research in areas such as communication, perception, social-emotional intelligence and theory of mind” (Weir, 2018, para. 5). Musaddique (2017) argued that programmers should figure out how to make robots be able to communicate with someone as opposed to something nonliving. Further on, human intelligence could be neglected due to robots being active in humans' daily lives. Suppose robots are used to perform simple tasks that humans have grown accustomed to completing. In that case, a possibility arises that humans will have trouble completing those tasks if the robots become incapacitated. On the other hand, automation could make workers more productive, driving economic growth, and improving overall pay globally (para.5). Robots handling mindless tasks that humans used to perform heightens human creativity, which allows for humans to focus on their strengths, being professional judgment, and aesthetic sensibilities.

While robots can perform simple tasks, they can also assist humans in elaborate, futuristic areas; one of which is the ascendance to Mars. Robots can help humans better understand the several severe problems they face today and will face in the future, and possibly find solutions to those problems (Parisi, 2014, p. 473). The Mars rover, named Opportunity lasted from 2004 to 2018, it managed to give 14 years of data collected from Mars. Opportunity returned over 215,000 pictures of Mars to Earth, revealed over 52 rock surfaces with fresh mineral surfaces that can be used for analysis and cleared 72 additional targets with a brush so they could be inspected with spectrometers and a microscopic imager (Northon, 2019, para.11). Through the use of robots, humans can receive more information without having to go into space themselves. Using NASA's highly developed rover speak for themselves, humans have learned tremendously from Opportunity's findings of rocks that surface Mars. Another rover that assisted to the discoveries made on Mars is Spirit; “Among her myriad discoveries, Spirit found evidence that Mars was once much wetter than it is today and helped scientists better understand the Martian wind” (“Mission,” n.d.). Spirit’s findings provided evidence that Mars now has a drier climate and intricate wind patterns. Mars rovers possess technological abilities that represent the current highest level of artificial intelligence.

Aside from robots assisting as aids in a space expedition, they can perform service jobs such as acting as companions for humans. Through advanced technology, additional possibilities for robots in society arise; sex robots are included. Sex Robots are already present in society and are robot companions or sexual partners that can engage with humans. The degree of artificial intelligence is currently limited for sex robots, but as technology develops, sex robots will be able to act and physically look like humans. TrueCompanion’s Roxxy is the world’s first sex robot; she can be customized in various

ways and has multiple hairstyles, behaviors, and personalities to select from (Danaher & McArthur, 2017, p. 6). Within society, the use of sex robots can be debatable. Sex robots allow those who are physically and mentally disabled to be satisfied sexually without violating the sexual rights of anyone. In addition, no disease can be transmitted through sex robots, sex is available at any time, and there will not be any psychological impact on the sex robot. However, sex robots might hurt relationships with other humans, and sex with a robot can become addictive. The implantation of sex robots raises the concern of robots replacing humans, regarding occupations and companions. As of now, sex robots are still being developed, but they will take years until they become the "norm" or become popular enough to reach that point.

The Future of Robots

As technology continues to advance, there is a wide range of possibilities for robots in the future. Scientists' goal about artificial general intelligence 30 years out into the future, or centuries to come, is to have a self-teaching system that can outperform humans across a wide range of disciplines (Talty, 2018, para. 6). The ultimate target for robotics is to have robots that are self-taught and are better than humans in several areas. Robots in society offer advantages to humans by making their work-life more comfortable. Additionally, since citizens are losing jobs, a potential solution is a universal income for the unemployed, allowing them to pursue different careers without poverty.

Conclusion

Humans have a different definition for what a robot is considered; the overall meaning is a machine that can perform a task. Robots that are programmed to have artificial intelligence are capable of learning from situations by trial and error, which then allows them to be coherent within humanity. Robots offer humans more opportunities for carrying out tasks more efficiently in the work field, as companions, and in society altogether. Human-machine collaboration allows companies to interact with employees and customers in a novel, more effective way. Robots can assist humans in a variety of techniques based on what robots are needed for, and the programming of robots will affect and determine what tasks they can accomplish. As society progresses, robots will work alongside humans exploring Mars, in the work field, and for futuristic jobs that humans will not be capable of doing.

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Finding Nemo and Learning How to Manage Stress by Isabella Donadio-Pizzolato[†]

Sometimes, people go through traumatic events during their lives, and it can affect not just themselves but the people around them as well. In *Finding Nemo*, a movie directed by Lee Unkrich and released in 2003, Marlin is a fish and has a severe Post-Traumatic Stress Disorder. He experienced his wife and all his five hundred eggs, except Nemo, being eaten by a shark. According to *The Gale Encyclopedia of Psychology* (2016) “Post-Traumatic Stress Disorder is a psychological disorder triggered by an extremely traumatic event” (p.905). Marlin felt powerless as he could not protect his family from being killed. Also, Marlin’s experience of helplessness and horror lead him to be overcautious with everything he does, especially with his parenting techniques. According to O’Hanlon (2002), “some people move on quickly, and some never get over it, and some people use the trauma to change their lives” (p.10). The traumatic event changed Marlin and the way he sees the world. He used to be happy and confident, but after this traumatic event, he became insecure, afraid, and sometimes even helpless. Although Marlin does learn how to manage his stress towards the end of the movie, his PTSD affected not just his own life, but his son’s life as well.

To begin with, Nemo was the only son who survived the attack which killed his mother and all his other siblings even before they were born; it was an extremely traumatic event. Because of this attack, Nemo’s egg was damaged, and it made him be born with one of his fins smaller than the other. Furthermore, Marlin did not let Nemo have a normal life because as *The Gale Encyclopedia of Psychology* (2016) illustrated, “people suffering from PTSD repeatedly re-experience a traumatic event vividly in their thoughts, perceptions, or dreams” (p. 906). Consequently, he always remembered the attack, and he wanted to protect Nemo in case they suffer from another attack someday. Marlin made a promise on the day the attack happened, and he said to Nemo that he would take care of him and would never let anything bad happen to him; consequently, Marlin became an overprotective parent. Overprotective parents (OP) can sometimes have extreme behaviors towards their children. According to Carpentier et al. (2008) “OP involves a specific pattern of parent behaviors that are overindulgent, overanxious, overprotective, or controlling in nature and considered to be excessive given the developmental level and abilities of the child” (p. 148). As Marlin was an overprotective parent, he did not want Nemo out of their safe zone. He said that Nemo’s fin was not good enough for one being smaller than the other, so he was not able to swim as well as the others. Nemo was very upset by hearing he was not capable of swimming as well as the

[†] Isabella Donadio Pizzolato is the President of the Medical Professions Association and a member of both Honors College and Phi Theta Kappa; moreover, she has recently received the Highest GPA Award in recognition of her academic excellence at the annual 45th Student Awards Ceremony

others because of his smaller fin. Consequently, when his new friends from school started to ask him to go out of the safe zone, he felt tempted to do it, but he did not because he promised his father he would not go over the safe zone. However, when he saw his own father asking for him not to do it because of his capacity of swimming, he wanted to prove he could do it, and he swam out of the safe zone. Nemo's behavior placed him under a feeling of autonomy; a feeling he normally did not feel as he had an infancy based on shame and doubt as described in *Erikson's Stages of Psychosocial Development* (2020). This event was the trigger to Marlin's stress to reach a limit, and it made him act impulsively.

Also, when Nemo swam over the safe zone; he was kidnapped by a scuba diver. As Nemo was being kidnaped, the other scuba diver took a picture of Marlin, and it made him partially blind for a few seconds, time enough for them to run away in a boat with Nemo. As Marlin was overstressed, he ran into the boat's direction to rescue Nemo, but he lost the boat's track. Marlin got very stressed and was not able to build strategies to cope with the stress. For instance, in *Exploring Lifespan Development*, Berk (2019) stated,

Problem-centered coping, in which a person appraised the situation as changeable, identified the difficulty, and decided what to do about it; and emotion-centered coping, which is internal, private, and aimed at controlling distress when little can be done about a situation (p. 423).

In this stressful situation, Marlin should have had an effective emotion-focused coping, so it would help him to solve his problems more calmly and generate better solutions. However, he had an ineffective coping, and he blamed himself for what happened to Nemo.

Because Nemo was gone, Marlin had to put his fear to the side and cross the ocean to find his son. Marlin was very afraid, and he was never planning to leave his safe zone. However, when the most important person in his life was gone, he felt desperate and was willing to do whatever it would take to bring Nemo back. For instance, he was afraid of being close to sharks, but he became a shark's friend. During his journey, he started to learn how to improve stress' management, including problem-center coping and emotional-centered coping. Furthermore, according to Aldwin, Yancura, & Boeninger (2010) "people who cope with stress more effectively may become more realistic about their ability to change situations and more skilled at anticipating stressful events and at preparing to manage them (as cited in *Exploring Lifespan Development*, 2019, p. 423)

Finally, Marlin was not aware that swimming away from the safe zone was less danger than feeling stressed every day. For example, when someone is feeling stressed constantly, they are willing, without noticing, to damage the cardiovascular, immune, and gastrointestinal systems. Also, according to the American Psychological Association (APA), chronic stress has been linked to significant health consequences, including: irritability and moodiness, anxiety or panic attacks, stomach problems and headaches, sleeping problems, sadness or depression, and a weakened immune system (Bratsis, 2012, p. 74). Moreover, Marlin developed few strategies to find Nemo. For instance, seeking

social support for emotional reasons (seeking for emotional support, sympathy or understanding) (Orzechowska et al., 2013, p. 3). Consequently, Marlin started to cope with all the stress he was feeling.

After the long journey, Marlin found his son. Then, he started to believe in his son's capacity in doing things by himself. Also, he learned that life is enormous and full of adventures to be explored. He realized that he should be there for Nemo, and do not reprimand him. He should be a democratic parent, which means he would prefer to work in the role of an adviser for Nemo. Consequently, Marlin's stress levels decreased, and he became a more resilient and peaceful individual with his stress management skills improved.

To conclude, Marlin had been through traumatic and stressful events in his life. Moreover, he had to learn how to manage stress; consequently, he had to build strategies to cope with it. Also, he used and improved his stress management abilities to find his son and to be a better father, letting Nemo live his life with autonomy instead of shame and doubt. Marlin is an inspiration for being through so much and still loving his son more than anything. His love overcomes all his fears and problems.

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How Will Water Purification Systems Evolve in the Coming Decades? By Ivan Franco

Abstract

One of the most commonly asked questions for the future is how humankind will support the exponentially growing population. This research paper will address the bigger picture of water-based purification systems and the chemistry behind each method of purification. Water is the biggest issue to tackle because inadequate access to clean water and poor sanitation affects millions of people while affecting nations worldwide. The lack of proper water purification systems causes millions of people to suffer from malnutrition, neurological conditions, and waterborne diseases. The current forms of water purification are not efficient as it should be and exploring new alternatives might be the solution to the question. The objective of this research paper is to demonstrate common applications for water purification and elaborate on future applications. This research paper will contain multiple questions that branch off the main question, to provide a full analysis of the current water purification systems and future ones. Therefore, the purpose of this research paper is to understand how water purification systems function and touch on the current research done towards improved systems.

The world is facing an astronomical problem affecting millions of lives as a result of inadequate access to clean water and efficient treatment facilities. Unfortunately, this problem will continue to expand as water scarcity increases, even in areas that have been considered safe for decades. Addressing this issue is going to call for the brightest minds in the world to develop a revolutionary method of purifying water at a fraction of the energy and cost while being as eco-friendly as possible. In the fourth century, the Ancient Sanskrit and Egyptians practiced the use of purification by boiling and heating the water under the sun (Daniel, 2015). The Egyptian's method of filtering water through coarse gravel and sand in order to remove impurities was revolutionary at the time. The Ancient Egyptian method of water disinfection shares similar techniques in the United States and European nations, especially by the end of the nineteenth century. The use of chlorine in 1905 was the most effective method for water purification in London and some might argue that it is still the preferred method (Lenntech, 1998). In the modern world, the methods of purification have transformed the way humans see drinkable water, with a maintained objective of removing any unwanted particles that make water unfit for human consumption. Whether the applications are for commercial use or household use, widely varied techniques are available that remove contaminants like microorganisms, micro-solids, organic materials, inorganic materials, and environmental pharmaceutical pollutants. All these methods come with advantages and disadvantages, usually, the cost of some purification techniques is expensive which can affect the quality standards expected on processed water. The disadvantages of water purification systems display the inefficiency the world is facing and exploring new alternatives might be the solution to the growing question regarding water purification.

What Are the Common Methods of Water Purification?

The development of specific water purification systems can vary depending on the purpose and cost of treatment. The first common technique for purification is through a method known as “activated carbon filtering,” which filters contaminants and impurities using chemical absorption. The advantage of activated carbon filtering is by effectively removing chlorine, micro-solids, and volatile organic compounds from water. When dealing with chlorine, the activated carbon reacts with chlorine forming chloride ions, in the process of removing chlorine from water and rendering chlorine to cause harm (Environmental Protection Agency, 2007). While activated carbon is safe for human consumption, realistically other purification systems work along with activated carbon filtering that extracts the carbon from the water. Multiple factors such as the amount of pollutants in the water, water acidity, water temperature, and how long the activated carbon spends filtering water cause limitation in the effectiveness of the system.

The second common technique involves chlorine dioxide which is more of a support system rather than a primary one. Chlorine dioxide’s main purpose as a purifying agent is disinfecting the water. Chlorine dioxide is extremely dangerous as a gas, and powerful in its liquid state so therefore chlorine dioxide is used to remove unpleasant odors and taste by killing microorganisms, bacteria, and algae in the water. The science behind this treatment is that chlorine dioxide is soluble in water and extremely reactive with other compounds once in a solution. This extremely reactivity is what allows for the disinfection of the water by killing the bacteria and microorganisms, multiple treatments are necessary to ensure the standard of water quality is met (Environmental Protection Agency, 2007). Some limitations associated are the risks in transporting and handling chlorine dioxide in its gaseous state due to its instability. The biggest drawback in the production of chlorine dioxide is that large quantities of chlorine gas form and the chlorine reacts with organic matter to form disinfection byproducts which are carcinogens. These byproducts are dangerous, and high exposure has been linked to cancers, adverse birth outcomes, and health issues. Fortunately, there are systems in place to detect any build-up of disinfection byproducts and water is tested regularly to ensure the quality (Centers for Disease Control and Prevention, 2016).

The third most common form of purification involves direct filtration which involves untreated water passing through granular materials that remove solid contaminants. Direct filtration first utilizes a chemical coagulant like iron or aluminum salts which are added to the water, these compounds react with particles inside the water and begin precipitate together (Environmental Protection Agency, 2007). After some time, the water will go through filters to ensure most of the contaminants are removed. The water quality properties such as temperature and pH dictate the effectiveness of direct filtration. Temperature impacts the direct filtration process by affecting the viscosity of the water. Low temperature can also decrease the chemical breakdown of a compound due to molecules moving slowly and increasing the time for a reaction. The pH affects the solubility of the contaminants and the effectiveness of infiltration of the micro-solids. (Water

Treatability Database, 2007). Direct filtration is a more cost-effective water purification system and contains a wider effective range of water transparency.

The next technique for water purification involves ion exchange, which is the process of removing dissolved ions from a solution and replacing them with other, less toxic charged ions. In the world of chemistry, there are two different groups of ions, cations, which are positively charged and anions, which are negatively charged. Ion exchange occurs between a solid (resin) and a liquid, the resin material would swap favorable ions with the unfavorable ions in the water. This is how ion exchange gets its name - positively charged ions exchange for a positively charged ions available from the resin surface, usually sodium ions. Likewise, negatively charged ions are exchanged with anions from the resin surface, usually chloride ions (Environmental Protection Agency, 2007). The anion exchange is beneficial when extracting contaminants like nitrate, fluoride, sulfate, and arsenic ions from the water since those compounds are dangerous to humans in large concentrations. While ionic exchange sounds futuristic, the operational cost for the exchange is pricy and that is a huge limitation in the advancement of this system. Also, this system is generally not effective for low pH levels, complex mixtures of metals ions, and high concentrations of iron, manganese, and aluminum since these metals can form precipitate solids that plug the system up. As a result, ionic exchange is extremely effective, but only under certain conditions.

One more method for purification involves ozone which is thought of as the strongest oxidants and disinfectants available. This technique of purification is a support system and aids the bigger systems, like chlorine dioxide. Ozone's short half-life limits the timescale and as a result, must be used immediately. Ozone degrades quickly over time and the compound is only present from a few seconds to 30 minutes (Environmental Protection Agency, 2007). The advantages of ozone are the strength of disinfection against bacteria and viruses. Also, the oxidizing properties can even reduce the concentrations of metals like sulfur, manganese, iron, and remove odor and taste issues. The oxidizing properties oxidize the metals to form insoluble metal oxides and those micro-solids can be removed by another system like direct filtration. While ozone is primarily used for metals, it is also effective against organic particles by chemical oxidation (Environmental Protection Agency, 2007). The biggest drawback to ozone is the instability of the compound and the rapid rate at which it degrades over time.

Lastly, reverse osmosis is a favorite water purification system among households and large-scale applications. Osmosis itself is the natural flow of a solvent passing through a semipermeable membrane from a less concentrated solution into a higher concentrated area, doing so to equalize the concentration on each side. Reverse osmosis works by a solvent passing through a porous membrane in the opposite direction through higher pressure. The pressure in reverse osmosis forces the water through the membrane, increasing the dissolved contaminants on one side and leaving a lower concentration of dissolved contaminants on the other (Environmental Protection Agency, 2007). The semipermeable membrane allows for reverse osmosis to operate, leaving clean drinkable water at an extremely affordable price to maintain. The reason why this technique is widely

used for household application is the effectiveness in water purification and the system is fully automated. Since the pressure separates most solid particles on the other side of the tank, the drawback of reverse osmosis is that there are reduced good minerals in the water. Some essential minerals are needed at the cellular level to promote overall heart and muscle health, which can negatively impact people with deteriorating health.

In 2006, the City of Manalapan, Florida finished a project involving reverse osmosis for city use. The scale of the project involved constructing well pumps, chemical feed systems, high-pressure pumps, and valves because the water needed to travel at the same pressure along the entire system to be effective (Christensen, 2006). The cost of the project is unknown to the public, but due to the massive upgrade in the infrastructure, the number could be in the millions of dollars. Overall, reverse osmosis is more effective when the applications fall under consumers and not to giant scales.

What Are Some Current American Issues Regarding Water Purification Systems?

In April of 2014, the city of Flint, Michigan made a switch from obtaining water from Detroit to Flint River due to the lowered cost. The Flint River water was naturally corrosive, containing high levels of dissolved chloride ions - roughly eight times more than Detroit's water. As mentioned in the chlorine purification system, the chlorine ions are concerning in high concentrations and highly reactive to iron and lead which are found in the water pipes (Flint Water Crisis, 2019). The water from the Flint River contained high levels of E. Coli, leading to more chlorine being added to disinfect the water. The high amounts of chlorine created byproducts that reacted with organic matter in the water. Another countermeasure had to then be implemented: ferric chloride, which removes organic matter from water. Despite adding more chlorine to have cleaner water in Flint, the systems did not account for the increase of corrosiveness of the water (Denchak, 2016). Usually, Cities coat the inside of any existing lead pipes with phosphates because the water will not react with the barrier of the multiple compounds. Unfortunately, the city of Flint did not treat the pipes with organophosphates, and so the corrosive water began to extract lead at an alarming rate. At this point, thousands of residents of Flint were receiving high concentrations of lead and other harsh metals. The Environmental Protection Agency stepped in to provide a disaster relief effort, meeting with homeowners to better understand how lead is behaving in the plumbing and implementing proper corrosive controls to restore the water quality (Cassell, 2017). The issue partly arises from the lack of a universal form of purification system. Either the water must be treated with powerful disinfectants and then filtered out or use a strong pressure to filter the water.

How Does the European Union Ensure Proper Quality for Water?

The European Union is unique by setting standards for each country of the union to ensure quality for drinking and recreational purposes. The sewage from homes and industries undergoes an extreme treatment process to purify the water. Agricultural pollution is a growing issue for the EU since the pollutants get into the groundwater, which affects the status of drinkable water (European Environmental Agency, 2008). The United

States and the European Union share similar methods of quality control and the same purification systems.

What New Advances Are Coming Water Purification Systems?

Systems are constantly evolving, due to the nature of developers always looking for the “next big idea” and ultimately improving the safety of water. For starters, there is a group of researchers at Stanford University that is developing a small anaerobic treatment plant in Redwood Shores, California (Abate & Myers, 2018). An anaerobic treatment plant works by utilizing microorganisms to break down biodegradable materials into harmless products in the absence of oxygen. The group will eventually process 20,000 gallons of wastewater per day to test the capacity of the new system. Currently, chemicals are used to react with organic and inorganic compounds and are then filtered out. With this new method, the microorganisms will be more efficient in cleaning up any organic materials. The inorganic material is left to filters to be removed. This new system so far has been more cost-effective, and the microorganisms can digest pharmaceutical drugs and powerful industrial herbicides that are difficult to remove with the current systems.

The next upcoming system is the use of UV light to alter the DNA structure of microorganisms and deactivate them (Oram, 2014). This technology is still in the research and development stages, but the results are promising. Perhaps the Egyptians knew something about the power of the sun’s rays for purification. In using UV light, there can be a reduced energy cost in the system and reduced use of strong disinfectants like chlorine and ozone leading to a reduction in and developing byproducts. There are other advances like improving reverse osmosis, developing better filters, and better chemicals for water purification.

To conclude, this research paper has addressed the current strengths and limitations of water purification systems and provided some insight into future promising systems. While this research paper focused primarily on American systems, the rest of the world may not be up to par with the standards of the US. If incidents occurred like in the city of Flint, Michigan, then there must be more water related issues in the world that might not be public. Hopefully, water purification systems become inexpensive in the future so that they can become mass-produced since the world needs a solution to this growing issue. I believe that the research done by a group of Stanford researchers will be groundbreaking once mass-produced because they were able to create a system that is more affordable and efficient than the current systems.

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Naturopathic Medicine Vs. Allopathic

Medicine by Rachael Hobbs^{‡*}

Abstract

Within the medical health care community, from doctors to nurses to the patients being treated, there has been an ongoing debate between naturopathic medical treatments versus an allopathic approach to medical treatments. Following the rise of awareness involving healthy eating and exercising habits, individuals are searching for more natural options for solutions to issues such as: the common cold, cephalalgia, musculoskeletal conditions, sleep deprivation, chronic fatigue syndrome, gastrointestinal conditions, and other illnesses or conditions. In 420 BC, Hippocrates, the father of medicine, urged doctors; "leave your drugs in the chemist's pot if you can cure the patient with food" (Naturopathic, 2009, para. 5). Hippocrates simple yet powerful words still ring true today. An individuals' diet is a huge determinant regarding the state of health in which their body is in. Concerningly, most of America's population chooses to neglect the quality of their diet and lifestyle, hoping to solve their health issues with a various amount of prescribed pharmaceuticals. With the increasingly popular use of naturopathic medical treatments and remedies, there is also an increase in the controversy around this method of healthcare. Although there are limitations to what naturopathic treatments can cure or provide alleviation for, there are also immense amounts of benefits to choosing a more naturopathic approach to medical treatments. The question now is: what are the benefits and limits of naturopathic medicine compared to the benefits and limits of allopathic modern medicine?

Approach to Health

The purpose of practicing modern orthodox western medicine is to "find the pathological disease underlying a patient's illness and treat it; identify causal mechanisms underlying the disease and prevent it occurring in the first place" (Corp et al. 2018., para. 1). Allopathic medicine continues to save millions of lives every year with the aid of modern technology in medical emergency situations such as: car or work accidents, myocardial infarctions, or cerebrovascular accidents. However, once the patient has been treated and all symptoms associated with the patient's diagnosis have resided, the main job of the Medical Doctor (MD) has concluded and more often than not, pharmaceuticals then take on the role of keeping the patient in good standing health.

Conversely, naturopathic medicine is more focused on preventative medicine to alleviate the number and severity of medical emergencies their patients will encounter as

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they age. Naturopathic medicine “recognize[s] the body's innate healing capacity, emphasize[s] disease prevention, and encourage[s] [an] individual[’s] responsibility to obtain optimal health. Naturopathic treatment modalities include diet and clinical nutrition, behavioral change, hydrotherapy, homeopathy, botanical medicine, physical medicine, pharmaceuticals, and minor surgery” (Fleming & Gutknecht, 2010). Naturopathic Physicians (NP) view illnesses or diseases (nos, malaise, path/o) as a disruption to the body’s natural homologous state of being. Naturopathic medicine has a strong foundational belief that proper and adequate nutrition is the fundamental key to maintaining disease prevention and health promotion. Many variables can disturb this ideal state of homeostasis. Examples are poor or improper nourishment, inadequate exercise habits, or the possible chance of exposure to a toxin. The ultimate goal for naturopathic physicians is to identify and minimize the number of disruptions their patients' experience. A determinant, in this case, is a factor that can become a disturbance when it is compromised in some way within the body (see table 1).

Table 1. (Fleming & Gutknecht, 2010, para. 3)

Determinants of Health				
Inborn	Genetic Makeup (genotype) Intrauterine/Congenital Maternal Exposures -Drugs -Toxins -Viruses -Psychoemotional Maternal Nutrition Maternal Lifestyle Constitution – Determines Susceptibility	Hygienic Factors - How We Live	Environment, Lifestyle, Psycho-emotional, and Spiritual Health -self-assessment Exposure to Nature -Fresh air, clean water, & light Diet, Nutrition, and Digestion -Unadulterated food & toxemia Rest and Exercise	Socio-economic Factors -Culture, loving and being loved, meaningful work, and community. Stress (Physical/emotional) -Trauma (Physical/emotional) -Illnesses: Patho Biography -Medical interventions (or lack of) -Suppressions & surgeries -Physical & emotional exposures, stress, and trauma -Toxic and harmful substances -Addictions

When a disturbance occurs, several methods can be applied once the physician has diagnosed the patient's condition. Although the types of treatments vary, naturopathic physicians follow a very specific and adaptable order of therapeutic remedies. NP will prescribe minimal amounts of change in a patient's lifestyle and progress to higher amounts of intervention until the patient's homeostasis state has returned.

The order [of therapeutic remedies] begins with reestablishing the conditions of health, such as developing a more healthful dietary and lifestyle regime. Next, the body's natural healing mechanisms may be stimulated through techniques such as hydrotherapy, which can increase the circulation of blood and lymph. The third step is to support weakened or damaged systems with homeopathy, botanical medicines, or specific exercises, such as yoga. The fourth step is to correct structural integrity, which is typically done with physical medicine techniques including massage and naturopathic manipulation. The fifth step is to address pathology using specific natural substances, such as dietary supplements. The sixth step is to address pathology using pharmaceutical or synthetic substances. Surgical correction is reserved for the final therapeutic step (Fleming & Gutknecht, 2010, para. 4)

Although Naturopathic Physicians and Medical Doctors have a different underlying approach to treatments, they both have the patient's wellbeing as their main goal for the overall outcome and often come to an agreement on certain treatments.

Musculoskeletal Conditions

A perfect example to use when comparing naturopathic medicine and modern western medicine is musculoskeletal conditions. According to one academic journal written May 2018, "[m]usculoskeletal conditions account for the greatest proportion of persistent pain across geographies and ages" (Briggs et al, 2018., p. 366). Therefore, medical professionals across the board should focus a great deal on preventative methods to avoid or minimize future cases of osteoporosis, osteoarthritis, rheumatoid arthritis, tendinitis, fibromyalgia, and many other musculoskeletal conditions. Naturopathic and Medical Physicians alike encourage patients to conduct preventative methods including daily exercise, cardio, and eating a healthy diet sufficient in calcium, vitamin D, iron, and amino acids. A few foods which contain a significant amount of these natural healing substances include eggs, salmon, citrus, spinach, almonds, seafood, poultry, and Greek yogurt.

In many cases, individuals have musculoskeletal conditions due to birth defects, or even poor genetics. A study conducted in 2010 on sets of twins concluded that in some cases "[a] single genetic factor underlies the propensity to report body pain at different musculoskeletal sites" (Frances et al, 2010., p. 1753). Therefore, even if an individual follows the lifestyle changes a NP prescribes them, the patient is genetically prone to still have specific degenerative musculoskeletal conditions and those natural treatments may not have a significant effect on the condition. Modern medicine has cultivated multiple treatments for these particular situations. A few of these treatments include but are not

limited to: medical tattoos (similar to acupuncture), corticosteroids injections (typically for carpal tunnel syndrome), Nonsteroidal Anti-inflammatory Drugs (NSAIDs for rheumatoid arthritis), and Bisphosphonates (commonly used for osteoporosis). Depending on the diagnosis and the respective treatment, patients may need reoccurring treatments in order to keep the symptoms of their condition non-expressive. Conveniently, both Naturopathic Physicians and Medical Doctors can perform the majority of these treatments. However, Naturopathic Physicians may be restricted on which treatments they can perform depending on the laws of the state in which they practice.

Chronic Fatigue Syndrome

Understanding Chronic Fatigue Syndrome (CFS) is a key component to understanding the different types of effective treatments which physicians can prescribe. In 1994, the basic definition of CFS emerged for the very first time. Throughout the years, research and studies were conducted on CFS, leading to the revision of the fundamental definition in 2003 which excludes psychiatric illness. Chronic fatigue syndrome is now characterized as “a condition of long-lasting fatigue with no relief, accompanied by other mental, emotional, and physical symptoms of no other origin” (Bharadvaj, 2008, p. 3). An individual with CFS would portray symptoms of debilitating asthenia or paresis following the act of simple tasks such as making breakfast, walking upstairs, taking a shower, or simply walking around one’s home. Currently, there still fails to be an exact diagnostic test which can confirm whether an individual suffers from CFS or not. Therefore, it is often difficult and time consuming to diagnose an individual with CFS. However, there are multiple tests which can rule out other disorders in order for both NP and MD to isolate CFS from the numerous conditions which cause general fatigue. Some conditions which express similar symptoms as CFS “include a variety of autoimmune diseases, blood disorders, thyroid and adrenal disease, and other endocrine disorders such as panhypopituitarism, diabetes, ovarian failure... and muscular dystrophy” (Bharadvaj, p. 49).

Because the list of other possible conditions is so comprehensive and it would be impractical to test for each individual condition, physicians can conduct just a few simple tests which are more resourceful and are more cost efficient for both the patient and the physician. Complete Blood Count (CBC) is one of those said tests. Today, one of the most commonly performed laboratory tests is CBC with differential. CBC with differential “gives information about the production of all blood cells and identifies the patient's oxygen-carrying capacity through the evaluation of red blood cell (RBC) indices, hemoglobin, and hematocrit. It also provides information about the immune system through the evaluation of the white blood cell (WBC) count with differential” (George-Gay., & Parker, 2008., para. 1). CBC is one of the most useful tests because it allows a medical professional to gather information on several important stats in the body’s system while only performing a single phlebotomy on the patient. CBC with differential can rule out the likely possibility of a patient having anemia; the prefix an- meaning no, not, or without and the suffix -emia

meaning blood condition. In this case, anemia means the blood condition of having a deficient amount of red blood cells or hemoglobin in the blood. If chronic fatigue syndrome is ultimately diagnosed after concluding the results of the CBC, the respective physician will begin to prescribe treatments to the patient. Although there is no one specific treatment for CFS, there are a few different ways of treating the condition.

Approaching the treatment from the viewpoint of a naturopathic physician, he or she would typically prescribe “cognitive behavior therapy and graded exercise therapies [which] have shown solid evidence for efficacy thus far” (Bharadvaj, 2008, p. 66). CFS patients are often recommended to take part in physical therapy sessions to combat the progression of the condition and ideally cause the patient to gain strength, resulting in the slow progression to their healing. Approaching the treatment from the viewpoint of an allopathic medical doctor, he or she may prescribe physical therapy in addition to medications such as immunoglobulin, which is an antibiotic, or hydrocortisone, which is a hormone. However, studies in a systematic review of the scientific literature by Whiting et al. suggests that “pharmaceutical medication therapy, such as immunoglobulin and hydrocortisone, have ‘limited effects’ and that the clinical and research-based evidence is inconclusive.” (Bharadvaj, p. 66). Therefore, in this particular case, a patient might have better Omaha system by choosing to use naturopathic treatments such as the ones described previously.

Conclusion

When it comes down to the question of which kind of medical professional a patient should receive treatment from when he or she is in need of it, the simple yet complex answer is that it depends. It not only depends on the symptoms and overall diagnosis of the condition or illness the individual has, but it also depends on the severity of the said condition or illness. Ideally, an individual should take care of his or her body and be proactive with their own health and general wellbeing. Individuals need to exercise daily, maintain a healthy balanced diet, and avoid toxins that damage their body’s especially if they wish to maintain the longevity of their lives’. However, even some of the most health-conscious people cannot avoid every illness and/or condition. In a case in which an individual does become ill or has a condition, he or she should first visit a naturopathic physician to see what the most effective treatment is with the least amount of negative side effects. This physician can also provide more extensive information on preventative methods to minimize the individual’s future disruptions in their homeostasis state. In the case of a more severe situation in which the patient needs immediate and/or intensive treatment, the individual should seek care from an allopathic medical doctor. Individuals who have suffered from a car accident, have an adenocarcinoma, or need surgery for a rhinoplasty, rhytidectomy, or a temporal hemorrhage are perfect examples of individuals who should consult with a medical doctor. Both naturopathic physicians and allopathic medical doctors alike have the patient’s health as the highest priority and therefore will prescribe the most effective treatment to the best of their knowledge to save or enhance the life of their patient.

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Arranged Marriage – Past Relic or Future Trend

by Hoang Nguyen

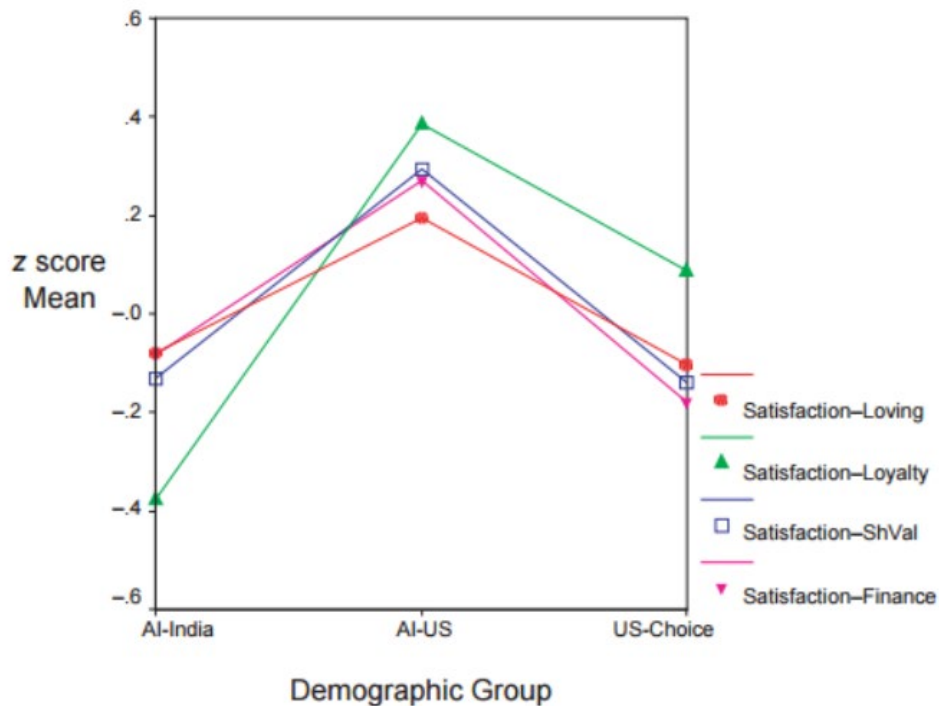
Abstract

This study was conducted to compare different aspects between arranged marriage and marriage of choice. Using the secondary analysis method in recent studies, key aspects including marital satisfaction, factors that influence marital success, and the link between marriage type and culture were examined to find out the differences between these two types of marriages. The results have shown that there is no significant difference in both marital satisfaction and the factors that make those marriages successful. The results have also shown that there is a connection between arranged marriage and collectivist culture, along with marriage of choice and individualistic culture. What is remarkable from the result are commitment and loyalty, not love, determine the success of marriage.

Arranged marriage is marriage in which “families may play a role in choosing the marriage partner, but both individuals are free to choose whether or not to marry and when to get married” (U.S. Citizenship and Immigration Services, 2018). Arranged marriage is different from forced marriage, which “happens when families or others both arrange the marriage and deny the individuals to be married the ultimate choice of whether, when, and whom to marry” (U.S. Citizenship and Immigration Services, 2018). Today, forced marriage is banned by law in most countries. Arranged marriage accounts for 54% of marriage worldwide (“Arranged Marriage Worldwide Statistics,” n.d), and the rest is marriage of choice, which is marriage based on romantic love and freedom of choice. The purpose of this paper is to compare key aspects of arranged marriage and marriage of choice, including marital satisfaction, existence of love, factors that determine the success of marriage, and connections with social culture.

Recent studies have shown that the level of marital satisfaction in arranged marriage is not lower than in marriage of choice, and in some cases even higher. Madathil and Benshoff (2008) conducted a study that compared the level of marital satisfaction in arranged marriage and marriage of choice. The sample in their study was 587 people, who belonged to one of three groups: Indians in arranged marriages and living in the United States (U.S), Indians in arranged marriages living in India, and Americans in marriage of love living in the U.S. Using the questionnaire method, this study assessed the level of marital satisfaction among these three groups based on four key factors: love, loyalty, value sharing, and finance. In the below figure, the outcome revealed that the level of marriage satisfaction in the first group, Indians in arranged marriage living in the U.S, was much higher than the other two groups, on all four factors mentioned above. The results between the other two groups, which included American in marriage of choice and

Indians in arranged marriage living in India, did not show a significant difference in the level of satisfaction in marriage.



Another study by Pamela C. Regan et al. (2012) pointed out that there is no significant difference in the level of happiness between these two types of marriages. In this study, a sample of 58 Indian- Americans, in which 28 people had arranged marriages, and 30 people had marriages of choice, was surveyed on marital satisfaction based on four factors: passionate love, companionate love, satisfaction and commitment. For gender specification, this sample had 24 men and 30 women. They came from many religions include Hindu (69%), Sikh (17.2%), Muslim (6.9%), and other (6.9%). On average, they had been in marriage for 9.7 years. The result was expected to show that the level of commitment would be higher in arranged marriages and the level of love would be higher in marriages of choice. However, as shown in the below table, the marital satisfaction in both types of marriages on all four factors was almost the same. More than that, the results also showed higher levels of marital satisfaction for men than women. Although these two studies have their own limitations, such as the missing of Indian-in-marriage-of-choice group in the first study or the small sample size in the second study (N = 58), both indicated that marital satisfaction was achievable in arranged marriage as well as marriage of choice.

RELATIONSHIP OUTCOMES (MEAN SCORES) AS A FUNCTION OF PARTICIPANT SEX AND MARRIAGE TYPE

Measure	Arranged Marriage		Love-Based Marriage	
	Men	Women	Men	Women
Passionate love	8.3	7.9	8.4	8.1
Companionate love	8.4	7.9	8.6*	7.8*
Satisfaction	8.7	7.5	8.2	7.7
Commitment	8.9	7.7	8.9	8.1

Note.—Scores on each measure can range from 1 to 9, with higher scores indicating greater levels of the outcome variable. Starred means are significantly different at $p < .005$.

The success of marriage is achieved when both people in the relationship have high level of satisfaction. Although the starting point of arranged marriage and marriage of choice cannot be more different, the factors that make a marriage last was the same. In the previous study by Pamela C. Regan et al. (2012), commitment was the factor that was most appreciated by participants in marital success, whether in arranged marriage or marriage of choice. Commitment was measured by answering questions such as “to what degree are you satisfied with your relationship?” and “to what extent are you committed to your relationship?” (p. 919) For passionate love, the results showed significant differences related to gender. Being seen as more emotional, women in both types of marriage appreciated passionate love as high as commitment.

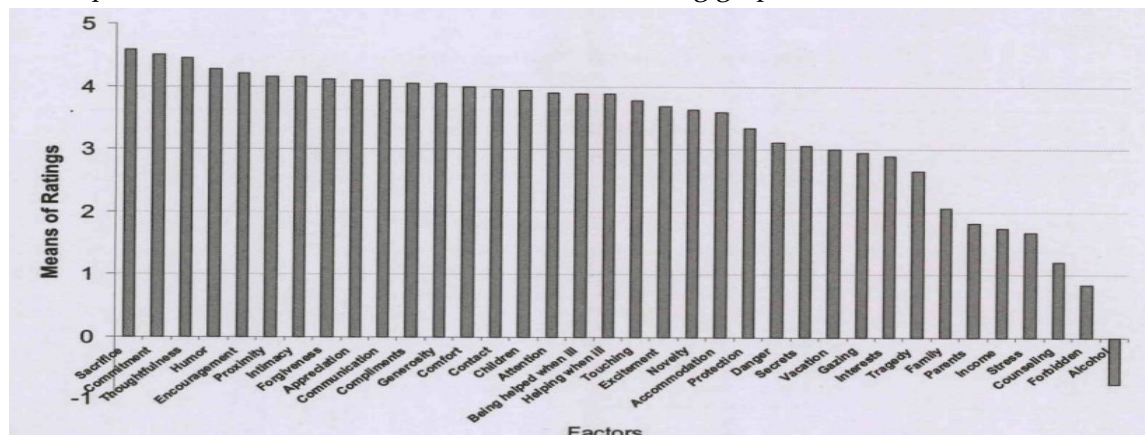
Another study by Myers et al. (2005) pointed out that love was not the most important factor to maintain a healthy marriage. The sample in this study included 45 individuals (22 couples and 1 widow) who were in arranged marriages and lived in India. The Characteristics of Marriage Inventory (CHARISMA), which included “Eighteen characteristics of marriage derived from an extensive literature search are provided in a list, and respondents are asked to indicate first the importance to them of each characteristic and then their satisfaction with each characteristic,” (p. 184) was used to measure not only the satisfaction but also the importance of love, loyalty and shared values in the success of marital life. The results from the sample were compared with data of individuals who were in marriages of choice and living in the U.S.

Instrument and Scale	Indian Sample		U.S Sample	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
CHARISMA				
Importance	5.11	1.03	5.41	0.52
Love	5.08	1.03	5.54	0.56
Loyalty	5.42	1.09	5.76	0.55
Shared Values	4.84	1.34	5.25	1.02
Satisfaction	5.23	0.65	5.28	0.74
Love	4.95	0.91	5.18	0.94
Loyalty	5.64	0.47	5.62	0.67
Shared Values	5.19	0.79	5.12	1.05
Overall Satisfaction	5.0	0.95	5.09	0.93

As shown in the above table, loyalty was considered the most important factor and contributes most to marital satisfaction. In the study, loyalty was defined as “characteristics of lifetime commitment, loyalty, and strong moral values.” (p. 184) Results from these studies showed that in arranged marriage and marriage of choice, love was important, but loyalty and commitment are the decisive factors that determine the success of marriage.

“First comes marriage, then comes love” is what Indians in arranged marriage often say (“Why Arranged Marriages Work: An Interview with Dr. Robert Epstein,” 2012, p. 1). For marriage of choice, marriage is the step after love has formed and flourished. In arranged marriage, love appears and grows gradually after marriage. Professor Robert Epstein, a Ph.D. in psychology at Harvard University, and his colleagues did two studies on how love emerged in arranged marriage. The first one was conducted by interviewing 30 individuals which included 14 males and 16 females. The participants came from 5 different religions (Unification Church, Islam, Hindu, Christian, and Buddhist) and most lived in the U.S. The average length of their marriages to the time the interviews were done was 19.4 years. The results showed that the estimated level of love of participants at the point they got married, on average, was 3.9 on the scale from 1 to 10. 19.4 years later, this level was estimated to be 8.5. Participants were also asked what factors contributed the most to the increase in love in their marriage. The most frequently mentioned factor was commitment. Other factors were communication and self-disclosure.

In the second study, the sample was 22 individuals including 13 males and 9 females. The participants came from several ethnic groups (Asian, White, and other) and 5 different religions (Christian, Hindu, Islamic, Jewish, Unification Church). The average length of their marriages was 16.4 years. All participants had arranged marriages, and 13 of them had not met their spouses until the wedding day. The participants were asked to answer questions related to their marriage. Additionally, the questionnaire also included 36 factors with the points scaled from -6 to +6. In quantitative results, the estimated level of love of participants, on average, when they were married was 5.1 on a scale of 1 to 10. 16.4 years later (the time the study was completed), the estimated level of love was 9.2. On the 36-factor question, the results were shown in the following graph.



The 2 factors that increased love the most were “Seeing your spouse make sacrifices for you” and “Expressing strong commitment to each other” (Epstein et al., p.349). On the qualitative side, participants revealed additional information about their marriage. 12 out of 15 participants said that they were not physically attracted to their spouses when they met the first time. To answer the question “How they managed to fall in love,” participants used the word “commitment” regularly. (Epstein et al., p.352) For the question about “if their love grew gradually or suddenly,” all participants said “gradually”. (Epstein et al., p.353). Both studies show that in an arranged marriage, if successful, love will grow over time. In other words, love is built gradually based on important factors such as sacrifice and commitment.

The choice of marriage is not only an individual's choice, but also greatly influenced by social culture. Through socialization processes such as education, peer communication, and religion, individuals share common values of the society, including how to get married. Madathil and Benshoff (2008) mentioned this aspect in their study. In individualistic cultures, such as America, individuals are “independent, free, and responsible for themselves, with an emphasis on self-discipline and accountability.” (Madathil & Benshoff, 2018, p. 223) This explains why marriage of choice is dominant in these cultures. On the opposite, arranged marriage is defined as “the arrangement of a marriage exclusively by a third party (someone other than the couple getting married) or by a ‘joint venture’ of the third party and the child/person getting married” (Bowman & Dollahite, 2013, p.207). Madathil and Benshoff (2008) defined arranged marriage as marriage “arranged by family members, not by the bride and groom” (p. 223). They also mentioned three common ways in practicing arranged marriage in India, which include traditional pattern, modified traditional pattern, and cooperative traditional pattern. In the traditional pattern, the choice of spouse is entirely determined by parents and elders in the family. In the modified traditional pattern, the young person has the ability to influence, to change or to make the final decision. In the cooperative traditional pattern, both the young person and the parents could make the selection. The important factor to note here is that in all three patterns, the influence of families, parents and the elderly is significant on the decision of the young person. That explains why arranged marriage is practiced in most collectivist societies, such as India, China and Japan.

In collectivist societies, parental responsibility for their children is fulfilled only after their children are married. This is shown in the article, “China’s singles market - Parents in Shanghai are shopping for their children’s spouses” by Cindy Yu on The Spectator magazine. In this article, the author told about his visit to a matchmaking market in Shanghai. Here, parents with unmarried children met to help their children get out of singledom. They tried to match their children together based on a list of age, personality, job, salary, and more. No one forced them to do that, but they see this as part of their parental duty. They only feel secure after their children are married. This demonstrates that arranged marriage is part of a collectivist culture, where most decisions made by individuals is influenced by parents and elders as they have more experience in

life and especially in marriage. These influences are for the greater good of the couple, the family and the society.

As Bowman and Dollahite (2013) mentioned a thousand-year history of arranged marriages, along with current arranged marriage's percentage ("Arranged Marriage Worldwide Statistics", n.d), arranged marriages will not be a past relic that would exist only in history books. Additionally, two prominent representatives of collectivist culture and arranged marriage, China and India, the two countries with the highest population in the world and contribute more than one-third of the world's population (United States Census Bureau, 2019), will continue to push the number of arranged marriages around the world. However, with the development of social network and the globalization trend, cultures gradually blend and learn from each other. This leads to changes in both the marriage of choice and the traditional arranged marriage. As mentioned in the "Transforming India's Concept of Marriage" (2015) video made by The New York Times in 2015, only 5% of marriage in India is marriage of choice, the rest is arranged marriage. However, the explosion of technology and matchmaking apps have created a new type of arranged marriage called "semi" arranged marriage. In this type of marriage, with the support of matchmaking apps, parents can pre-qualify many candidates who they think are appropriate for their children. As a result, the number of candidates who their children can choose increases significantly, thereby helping these young people gain more freedom of choice in arranged marriage. On the other side, according to Smith and Anderson (2016), 15% of U.S adults have used online dating services, which match people using algorithms based on user characteristics. Although the final decision still lies in the hand of the spouse, this type of marriage can be considered "arranged." In this situation, the arrangement is not made by parents but by online dating services. Future study can be conducted to compare the marital satisfaction of this "arranged" marriage of choice and "semi" arranged marriage. In the end, marriage is just a tool to help couples achieve happiness in life. Commitment, loyalty, and sacrifice are important factors that all couples need if they want to have a happy and lasting marriage. As Jackson Brown Jr. said, "Remember that creating a successful marriage is like farming: you have to start over again every morning," marriage is a long journey that needs two people who commit to go together until the end.

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A Scientific Exploration of the Absolute and its Properties, aided by the Use of Ontological Argumentation, Hypothetical Trans-Dimensional Sentient Geometric Lifeforms, Basic Mathematical Expressions, and Quantum Mechanical Interpretations and Paradoxes, Coupled with a Thorough Refutation of Current Cosmological Genesis Theories, and an Exploration of their Absurdities by Alexandru Pasarariu[§]

Can science prove that God exists? While the existence of God may seem like an unanswerable question fit only for the eternal debate among theists and their atheist rivals, such is not the case as through a scientific analysis of the universe and its laws it can be deduced beyond a reasonable doubt that God defined as a primal, immutable, perfect, omnipotent, omnipresent, and singular force not only exists but must exist as an inviolable axiom for the universe itself to exist.

God is Immutable and Transcends All Existence ($\aleph_{(E,e,\emptyset)} \in \Omega, \Omega \gg \aleph_{(E,e,\emptyset)}$)

One of the biggest paradoxes of logic is the endless recursion of creation which results from the postulation that for something to exist, something existing before it must have created it. This logical fallacy is most notable within the Big Bang^{**} theory propagated by renowned Oxford ethicist, and militant atheist Richard Dawkins, which postulates that the universe exists as an infinite recursion of Big Bang's and Big

[§] Alexandru Lucian Pasarariu is a recent graduate of Palm Beach States' prestigious Dr. Floyd F. Koch Honors College. Alex has also won the prestigious 4.0 GPA trophy along with the semiannual Play Think Win math competition during his short tenure at Palm Beach State and hopes to eventually obtain a Ph.D. and join other academics in the eternal quest for knowledge.

^{**} Kragh states that the Big Bang theory is the cosmological model for the observable universe proposed by Georges Lemaître in 1927, which postulated that all the matter and energy within the universe originated from a singularity, which expanded.

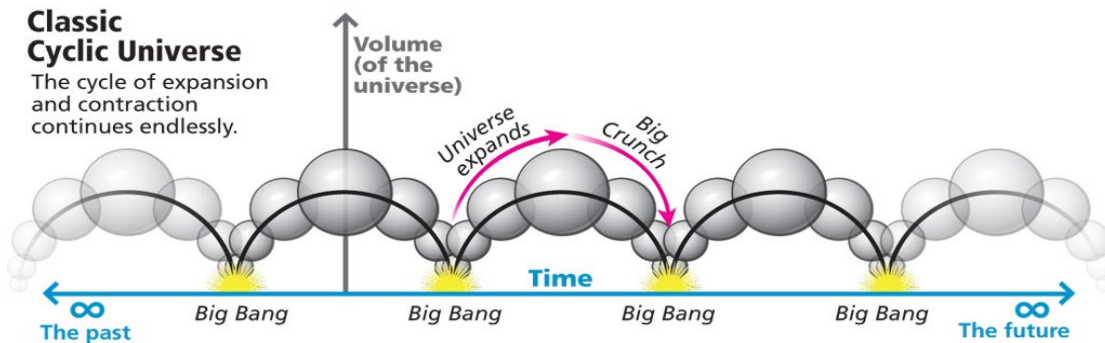


Figure 1 A depiction of the classical cyclical model. Notice how this theory does not explain the origin of time, which is immutable. (Kelley)

Although tantalizing to believe, Dawkin's theory not only suffers from the logical fallacy of being unable to explain the ultimate beginning of the universe's classic big bang big crunch cycle but is in favor of the existence of an immutable substance, as according to its teachings, this heartbeat-like cosmic cycle has existed, and will always exist, alongside the eternal flow of time. The more recent Vacuum Genesis^{††} theory, which supposedly addresses the infinite recursion paradox of the classic cyclical model also suffers from flawed reasoning.

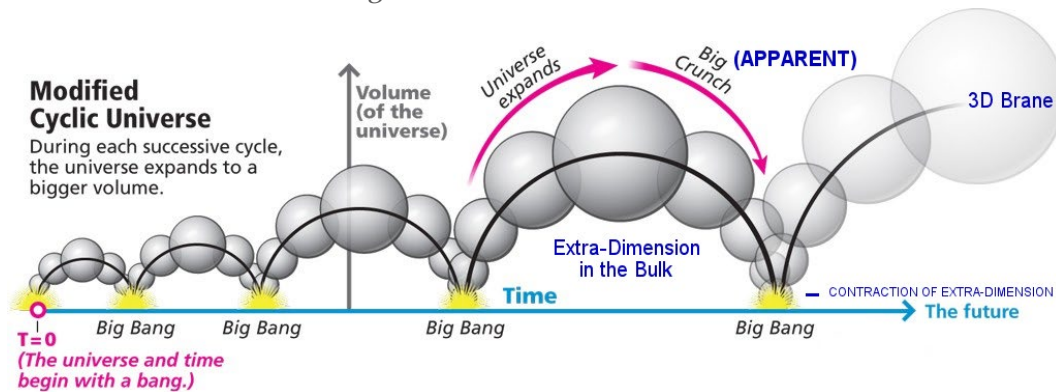


Figure 2 A depiction of the modified cyclical model with the addition of vacuum genesis. Notice how despite theorizing that the universe expands by one dimension within the extra-dimensional bulk, it fails to account for where the energy for such a theoretical expansion comes from. (Kelley)

^{††} Edward states that the Vacuum Genesis Theory is a scientific hypothesis proposed by Dennis Sciama and Edward Tyrone in 1969 about the Big Bang that questions whether the universe began as a single particle arising from an absolute vacuum, like how virtual particles come into existence and then fall back into non-existence.

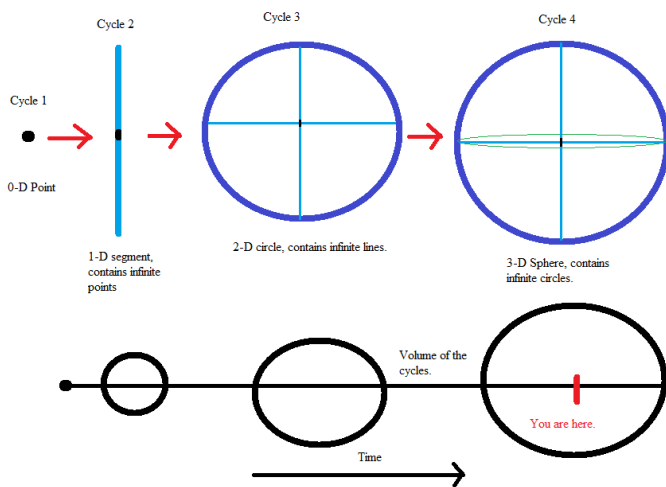


Figure 3 A simple representation of the supposed successive dimensional evolution universe based upon the modified cyclical model within figure 2. Somehow this system found a way to exponentially increase its volume even though the total amount of energy within it is zero, as it resulted from a quantum fluctuation. It is also important to note that this figure uses finite shapes to depict the modified cyclical model above, and would work with an infinite evolution of the universe (the finite segment and

square would be replaced by an infinite line and plane, while the point would remain unchanged). It is also worthy to note that this pictogram was inspired by the progressive Raven's matrices used within IQ tests.

According to the Vacuum Genesis theory, the universe is a product of a single particle arising out of an absolute vacuum, in much the same way quantum virtual particles rise and fall back into nothingness. While this theory may address the infinite recursion paradox which plagues the Big Bang theory, it fails to truly explain creation because while it is true that virtual quantum particles rise and fall, they do so not in the theoretical absolute vacuum postulated to have existed before existence, but in the quantum vacuum of the universe, a vacuum in which a state of absolute nothing cannot exist, as one of the biggest discoveries of modern cosmology is the existence of all-encompassing background energy, which permeates space-time known as the cosmological constant, which became evident with the discovery that the rate at which the universe is expanding is accelerating^{‡‡}.

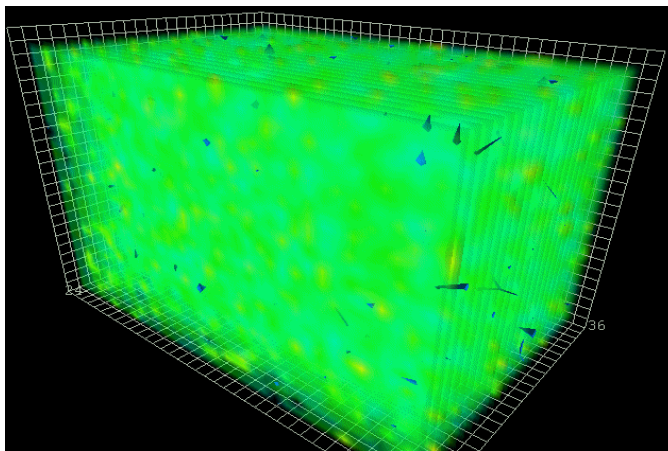


Figure 4 A depiction of the quantum vacuum from a supercomputer simulation of $24^3 \times 36$ space-time lattice using a 128-node Thinking Machine. Notice the distinct lack of empty space. (Leinweber)

The existence of a positive cosmological constant also undermines the existence of the universe because of a random virtual particle, as the total amount of energy contained in

^{‡‡} NASA states that high precision measurements of the observable universe done by the Plank spacecraft of the European Space Agency (ESA) seem to show an increase in the rate at which the universe is expanding, an acceleration for which scientists have no explanation, and use the placeholder "Dark Energy".

the universe is greater than zero, while virtual particles are always equal to zero in energy. Since the universe would require the presence of energy to create it because its total energy value is greater than zero as evidenced by the current understanding of its cosmological constant, an immutable preexisting, primal force must have existed before the existence of the universe, for the universe to arise.

Another aspect that prohibits the genesis of anything from absolute nothingness is the lack of dimensions such as time and space that the preexisting absolute void would have. Since the absolute void lacks a place along with a time for creation to occur, creation would not happen as it wouldn't have a place, or time, to appear. Picturing the initial quantum fluctuation which created the universe as a result of vacuum genesis in an absolute void would be similar to picturing waves without an ocean. A completely absurd concept.

The preexistence of the three spatial dimensions, along with its temporal counterpart would also incidentally rule out the spontaneous generation of an organized system with less entropy, because if an empty, 3-D void existed, its level of entropy would have been infinite, and would have stayed that way because the universal law of entropy states that ordered systems always tend towards disorder, and not vice-versa^{§§}. The philosophical principle of Occam's razor^{***} also supports the postulation that an infinitely disordered system would remain disordered because the principle states that given two competing explanations for an occurrence, the simplest assumption (that an infinitely entropic void will stay that way), is also more likely to be correct. Thus, for the universe to exist, there must have been a primal, ordered force, which created it, as an absolute void, in whatever form, would have remained eternally constant due to the infinity of its entropy.

The more exotic theories such as the Holographic Universe^{†††} theory believed by entrepreneur Elon Musk can also be countered with philosopher Renee Descartes's *Dubito, Ergo Cognito, Ergo Sum*^{†††} (I doubt, therefore I think, therefore I exist) argument which postulates that the existence of thoughts themselves, even the ones that ironically doubt the existence of existence, since even though thoughts are nondimensional, they exist for brief periods across time. Also, the Holographic Universe theory suffers from the faulty logic of failing to explain who or what created the hologram.

^{§§} Jaffe argues that the Second Law of Thermodynamics states that the total amount of entropy of an isolated system can never decrease over time. The total entropy of a system and its surroundings can remain constant in ideal cases where the system is in thermodynamic equilibrium, or is undergoing a reversible process, aka has zero total energy.

^{***} According to Gibbs, Occam's Razor is a problem-solving principle that states that "Entities should not be multiplied without necessity". The idea is attributed to English Franciscan friar William of Ockham.

^{†††} Susskind states that the Holographic Universe theory postulates that the entire universe is a computer hologram. This theory is notable for its perpetuation by famous intellectual Elon Musk.

^{†††} *Dubito, Ergo Cognito, Ergo Sum* (I doubt, therefore I think, therefore I am) is an argument developed by French philosopher Renee Descartes.

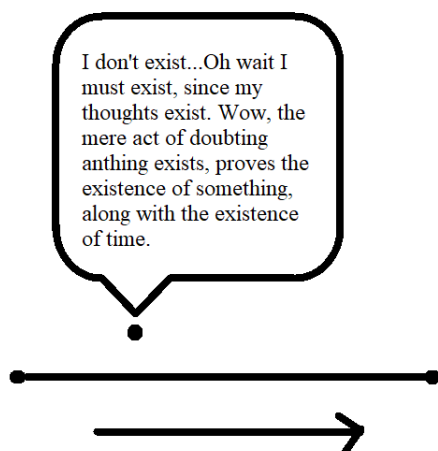


Figure 5 A geometric representation of Descartes's thought as a point. Although possessing zero spatial dimensions the fact that this point is temporal, proves the existence of something other than absolute nothingness.

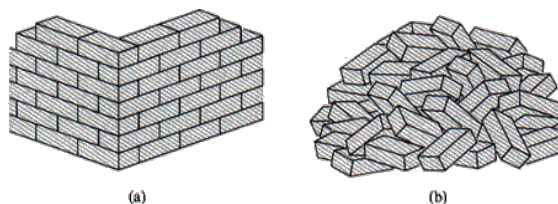
As such, the existence of the universe, whose total energy level exceeds zero, requires the existence of an outside creating force, which must be immutable, to abstain from the logical fallacy of infinite recursion. Thus, God, as an immutable, primal force, must exist and must transcend all existence.

God is Perfect and Transcends All Perfection ($\aleph_{(p,p,\emptyset)} \in \Omega, \Omega \gg \aleph_{(p,p,\emptyset)}$)

Another favorite talking point among atheists is the argument that since the universe is seemingly imperfect, God must also be imperfect, as an imperfect creation would seemingly point out to an imperfect creating force. While this argument may seem philosophically sound, the truth is that all aspects of the universe are quite perfect and constant, including the mathematically measurable constant of entropy, which can be mistaken for the universe's apparent state of imperfection.

One law of physics that proves the perfection of the universe is the law of conservation of energy and mass^{§§§} which states that matter cannot be created or destroyed. This is because the fundamental cosmic strings that make up the universe are highly miniaturized, perfectly efficient, perpetual motion engines^{****}. A perpetual motion engine itself being a hypothetically perfect construct that is 100% energy efficient and hence never loses energy. Since matter and energy cannot be created or destroyed, only transmuted, and since the universal space-time continuum itself is a quantum vacuum, made up of these perpetual particles, creation itself must be made of perfect parts, much akin to a construct made out of bricks which progressively gets more and more disorganized, while the bricks themselves remain intact.

Figure 6 A simplified depiction of the law of entropy. Notice how the blocks remain intact after the wall's disorganization. (Requirements for Reactions)



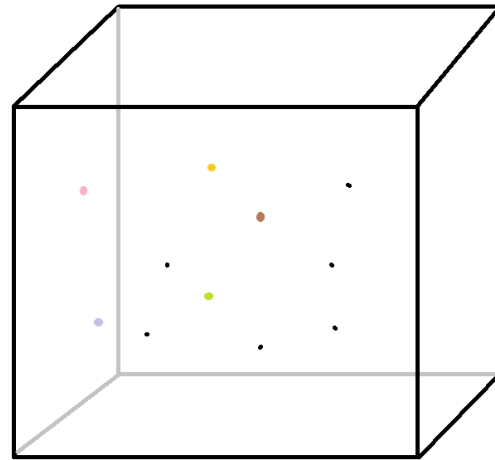
^{§§§} According to Gottlieb, the Law of Conservation of Energy states that the total energy of an isolated system remains constant. This law means that energy can neither be created nor destroyed, it can only be transformed or transferred from one form to another.

^{****} According to Lexico Dictionaries, perpetual motion machine is a hypothetical machine that can work indefinitely without an energy source. This kind of machine is impossible, as it would violate the first or second law of thermodynamics.

Other laws of the universe that are constant include laws such as mathematics, physics, and thermodynamics, which are the same across the space-time continuum. While it may seem absurd to think of a universally present power within the universe, it would seem equally absurd to think that math is not constant, with expressions such as $9 + 10$ equaling 21 in certain parts of the universe^{†††}.

Figure 7 A simplified depiction of how at every point of the universe, laws remain constant.

Entropy, the constant which causes the illusion of an imperfect creation is itself a perfect, measurable physical constant which states that according to the Second Law of Thermodynamics, ordered systems tend to progress towards disorder along with the progression of time. With time being defined as the indefinite, irreversible, continued progress of events, from past to present to future^{‡‡‡}.



At each point, $2 + 2$ holds true

Thus, through the exploration of its perfect constants, particles, and energies. The beginning of the universe can be pictured as a perfectly built sandcastle made out of indestructible parts which slowly self-destructs from its originally ordered state to the sum of its parts, the parts themselves never being destroyed.

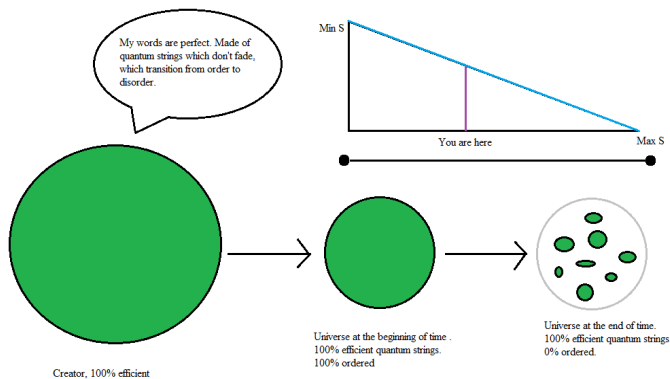


Figure 8 A simple representation of how the universe is made of perpetual particles, undergoing a transition from order, to disorder. It is interesting to note that according to the Banach-Tarski^{§§§§} paradox, an infinitely detailed 3-D ball can be reassembled into 2 identical ones, meaning that given the axiom that the Creator in the graph is infinitely detailed, so too will the creation be, without the act of creation diminishing the Creator.

Since the universe at present is at a point in time that is neither the beginning of time nor the end of time, a partially disordered state can be observed, akin to a semi-destroyed sandcastle slowly but surely fading away into the beach, while the sand grains themselves unchanged.

^{††††} The famous $9 + 10 = 21$ meme uploaded by an anonymous Vine social media platform user in 2014.

^{‡‡‡‡} The Lexico dictionary defines time as the indefinite, irreversible, continued progress of events from past to present to future.

^{§§§§} The Banach-Tarski theorem shows how any infinitely detailed 3-D object can be deconstructed and reassembled into two identical objects.



Figure 9 A simplified view of entropy in action. Notice how the sand remains intact. (Integral Axis)

As such, given that the universe is built out of unchanging particles, which need to transition from a state of order to a state of disorder for time to occur, the apparent state of imperfection seen within the universe can be explained through this transition, along with the state of perfection, and timelessness of both the figurative Sandmaker and his proverbial cosmic sand. Tangentially, the need for the transition from order to chaos to occur for time to exist would explain why a perpetual engine cannot be built within the universe, as it would be

affected by time, and thus tend towards disorder. As such, given that matter cannot be created or destroyed, coupled with the irreversible flow to chaos among ordered systems proves the scientific perfection of the creating force, while tangentially explaining the impossibility of creating a perpetual construct out of matter, even though the construct's subatomic particles would themselves be perpetual. As such, God must be perfect and must transcend all perfection.

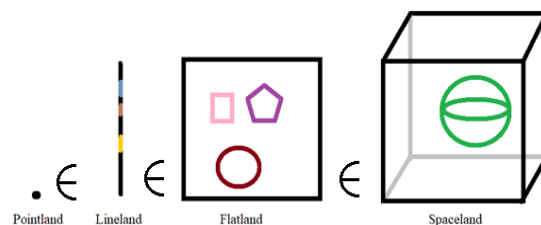
God is Omnipotent and Transcends All Power ($\aleph_{(S,S,\emptyset)} \in \Omega, \Omega \gg \aleph_{(S,S,\emptyset)}$)

Another paradox theist must address is the seemingly irreconcilable notion that God, even when compared to an infinite universe, is almighty, while the universe, despite its potentially unlimited size, remains nothing when compared to God. Yet despite it being seemingly impossible, such a paradox can be solved with a simple application of mathematics, and geometry.

The novella *Flatland: A Romance of Many Dimensions* by Edwin A. Abbott^{****} beautifully explains how the universe, while being infinite, is nothing when compared to the Absolute, along with tangential explanations for how a dimensionally higher entity could be all-seeing and seem miraculous to human eyes.

Within his work, Abbot postulates the existence of four planes of existence, of increasing complexity. These planes are called Pointland, Lineland, Flatland, and Spaceland, each containing intelligent life.

Figure 10 A simplified depiction of 0-D, 1-D, 2-D, and 3-D worlds and their geometrically consistent lifeforms.



**** Abbott's book is an eye-opening book by an 18th century schoolteacher which allows less intelligent individuals to explore the fourth dimension, through a novel depicting 0-D, 1-D, 2-D, and 3-D shapes.

From the graph, it becomes apparent that the addition of a degree of freedom within each of the planes of existence successively increases their complexity by an infinity. Thus, we can mathematically prove that finite and infinite higher-dimensional objects are infinitely larger than the sum of all the parts of a lower dimension.

From this elegant math, the sublimation of a set with no dimension of freedom (Pointland) into the Absolute (Omega⁺⁺⁺⁺) can be visualized, along with how degrees of freedom, relate to the transfinite, and the Absolute, with the final equation depicting how math itself relates to and is limited in comparison to the Absolute.
G = degree of freedom relative to Pointland.

Pointland, $G(P) = (1), P \in L \in \Omega, (\emptyset:P) = (0:1), (P:P) = (1:1), (P:\Omega) = (0:1).$

Lineland, $G(L) = (\infty P), L \in F \in \Omega, (P:L) = (0:1), ((P:L):\Omega) = (0:1).$

Flatland, $G(F) = (\infty^2 P), F \in S \in \Omega, (((P:L):F):\Omega) = (0:1).$

Spaceland, $G(S) = (\infty^3 P), S \in O \in \Omega, (((P:L):F):S):\Omega) = (0:1).$

...

Omniverse (infinite degrees of freedom), $G(O) = (\infty^\infty P), O \in \Omega, (O:\Omega) = (0:1).$

...

$\{\emptyset_G \ll P_G \ll L_G \ll F_G \ll S_G \dots \ll O_G\} = \aleph_{((\emptyset_G), (\aleph_g), (\aleph_G))} = \aleph_G, \aleph_G \in \aleph \in \Omega.$

$(\emptyset:\Omega) = (0:1), (\aleph_g:\aleph) = (0:1), (\aleph:\Omega) = (0:1), (\aleph_g:\Omega) = (0:1), \aleph_G \approx \aleph \approx \Omega, \aleph \neq \Omega, \aleph_g, \therefore \Omega \ni \aleph \ni \aleph_G, \Omega \gg \aleph \gg \aleph_G.$

...

$\aleph_{((\aleph_\emptyset), (\aleph_m), (\aleph_M))} = \aleph_{Math}, \aleph_{Math} = ((\aleph_\emptyset), (\aleph_m), (\aleph_M)), \aleph_{Math} = (\aleph_m)$

$\aleph_{Math} \approx \Omega, \aleph_{Math} \neq \Omega, \aleph_{Math} \in \aleph \in \Omega, (\aleph_{Math}:\Omega) = (0:1) \therefore \Omega \ni \aleph \ni \aleph_{Math}, \Omega \gg \aleph \gg \aleph_{Math}.$

...

From this mathematical representation, we can deduce that although Pointland may contain an infinite number of attributes, such attributes are nothing when compared to the next dimension, ad infinitum. This mathematically proves that a higher power can create an infinite lower power, which is nothing and will always be nothing when compared to its Creator. By using a point, line, and square analogy, a geometric Great Chain of Being⁺⁺⁺⁺ can be visualized and used to explain the omnipotent aspect of God, and how God can make both Creation, and its subcomponents.

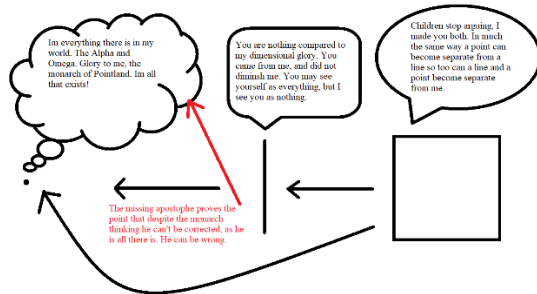


Figure 11 A depiction of how something infinitely large can be nothing compared to a higher power. It is important to note that an infinitely detailed 2-D sentient object can produce as many 1-D lines, and 0-D points as it wants as according to Hilbert's hotel paradox^{§§§§§}, any finite quantity, taken out of an infinite one, will not diminish the infinite set.

⁺⁺⁺⁺ According to Rucker, the concept of Omega was developed by mathematician Georg Cantor, who stated that there must be an uncontained set, which contains all others.

^{####} Suber states that the Great Chain of Being is a medieval hierarchy starting with God and progressing all the way down to rocks. This concept can be applied to trans-dimensional geometric models.

^{§§§§§} The infinite hotel paradox shows how an infinite quantity remains undiminished if a finite quantity is subtracted from it.

Using these dimensional axioms, we can prove that God, alongside any finite or infinite 4-dimensional entities, is infinitely more powerful than the sum of our 3-dimensional universe. Thus, God must be omnipotent and must transcend all power. God is Omnipresent and Transcends All Presence ($\aleph_{(D,d,\emptyset)} \in \Omega, \Omega \gg \aleph_{(D,d,\emptyset)}$)

One unsettling aspect of the theist world view is the omnipresent, all-seeing aspect of the Supreme Being. While extremely unsettling, Abbott's novella gives an unsettling proof through the science of geometry of how God, along with any higher dimensional life form, infinite or finite, would be all-seeing.

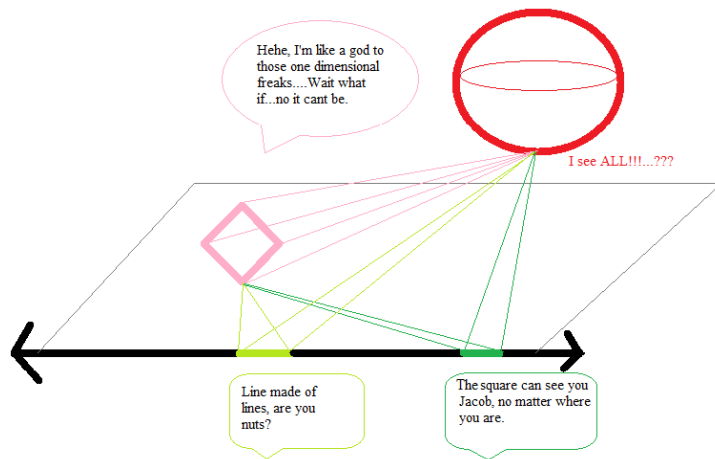
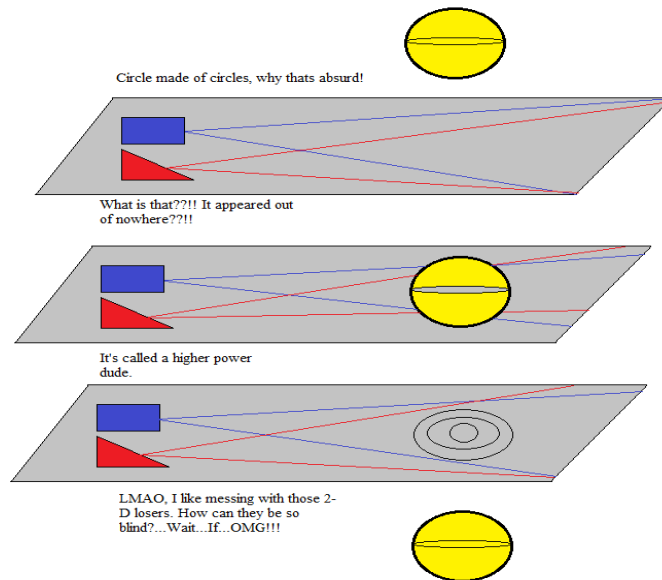


Figure 12 Although oversimplified, from this picture we can see how a two-dimensional representation of God can watch over all of the points of an infinite one-dimensional line. The system would work just as well with a sphere and infinite plane, or a hypersphere and an infinite cube. This mathematical depiction can be used to solve Schrodinger's paradox as the universe would be under constant observation by any fourth-dimensional minds, existing within the

dimensional bulk.

Figure 13 Through this pictogram, the full relationship between higher dimensional entities and lower dimensional ones can be observed. While Gödel the square is perfectly rational to believe the inexistence of the spherical angel, he is also incorrect. This depiction can also act as a possible explanation for miracle's and other paranormal events, as higher dimensional objects and beings can appear and disappear from the 3-D universe in much the same way the angel appears as a circle to the square, despite being a sphere, an infinity of circles.



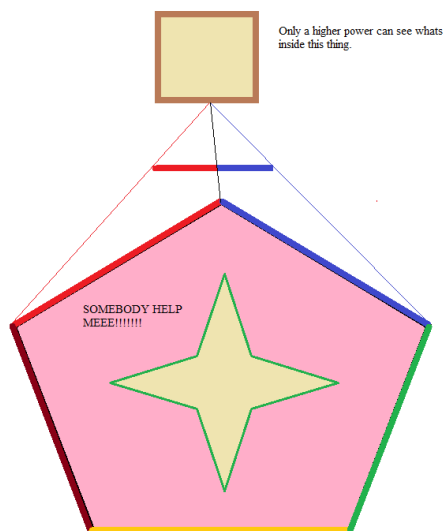
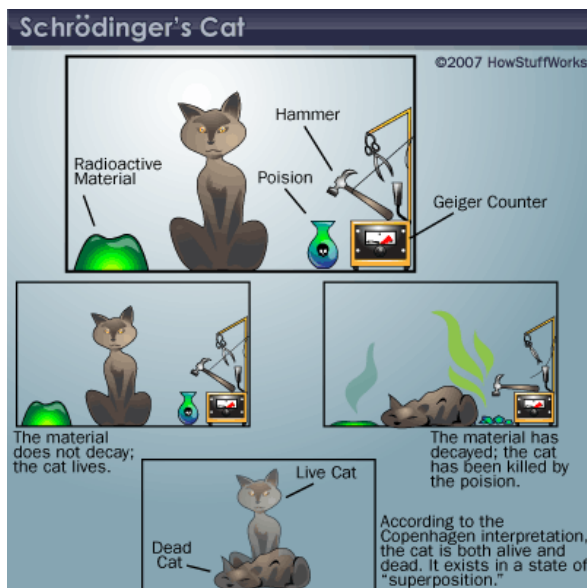


Figure 14 From this simple diagram, a 3-D “God’s eye” view can be shown concerning Victor von Square. It is also interesting to note the way Victor von Square sees his 2-D world in 1-D lines, in much the same way 3-D humans observe their world in terms of 2-D planes, Planes which are intersected to give the illusion of 3-D sight. Lastly, it can be deduced that things that are hidden from the universe are visible to God in much the same way the star is hidden from von Square, but perfectly visible to the reader.

Thus, using simple geometry, the relationship between the Absolute and the higher and lower order entities can be depicted, thus proving the omnipresence of the entity of the highest order, over all the

lower order entities. It is also of great importance to note that a universe under constant observation by a 4-D or higher-level entity would solve several quantum paradoxes such as the infamous Schrodinger’s paradox^{*****}, which postulates that a cat locked in a room with poison is both dead and alive, as there are no observers, and both states are equally probable.

Figure 11 Colorful depiction of Schrodinger’s cat. (HowStuffWorks)



Thus, since it can be inferred that the universe can be held under constant observation by a higher dimensional entity, and since such an observation would solve Schrodinger’s paradox through the universal application of the “consciousness causes collapse” postulation of the Von Neuman-igner⁺⁺⁺⁺⁺ interpretation of quantum mechanics. Thus, God must be omnipresent and must transcend all presence.

***** Thought Experiment by mathematician Erwin Schrödinger. It illustrates what he saw as the problem of the Copenhagen interpretation of quantum mechanics applied to everyday objects. The scenario presents a hypothetical cat that may be simultaneously both alive and dead, a state known as a quantum superposition.

+++++ According to Schreiber, the von Neuman-Wigner interpretation of quantum mechanics postulates that, lacking an observer, quantum particles exist in superposition.

Figure 15 Here the question of how God relates to and supersedes his creation can be elegantly answered through this diagram. The point, representing the universe is a 0-D nothing, when compared to the higher-order transfinite segments, despite containing an infinite number of attributes. The higher-order segments themselves are contained by the transfinite plane, upon which "God" sits, and is omnipresent, yet uncontained by it. This is because the plane itself is nothing when compared to "God". This is because "God" the pyramid is composed of an infinite number of planes.

God is Incomprehensible and Transcends Knowledge ($\aleph_{(K,k,\emptyset)} \in \Omega, \Omega \gg \aleph_{(K,k,\emptyset)}$)

Another paradox that Abbott addresses within his work is the explanation of the paradox that despite knowledge existing, some things are impossible to know.

To explain this quandary, Abbot uses the comparison of the kings of Pointland, Lineland, and Flatland to prove that the sum of all possible knowledge contained within the universe, a sum which unfortunately contains this paper as well, will never unravel god in the slightest bit as God is unknowable.

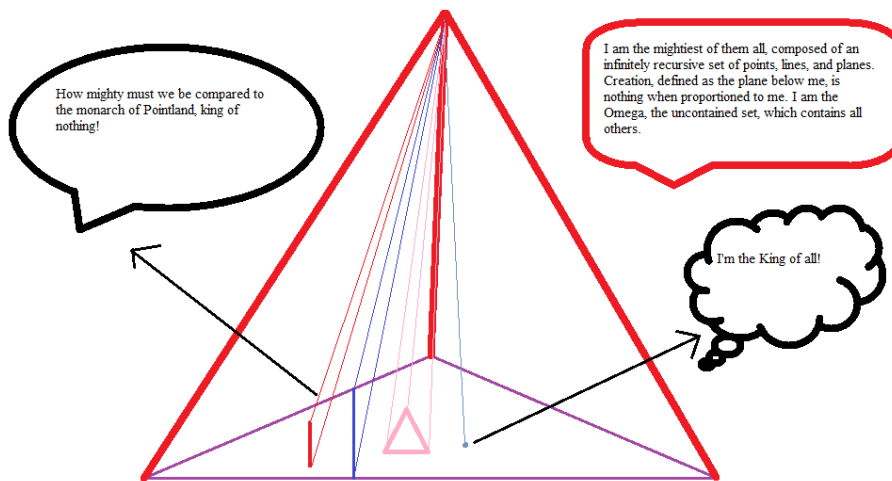
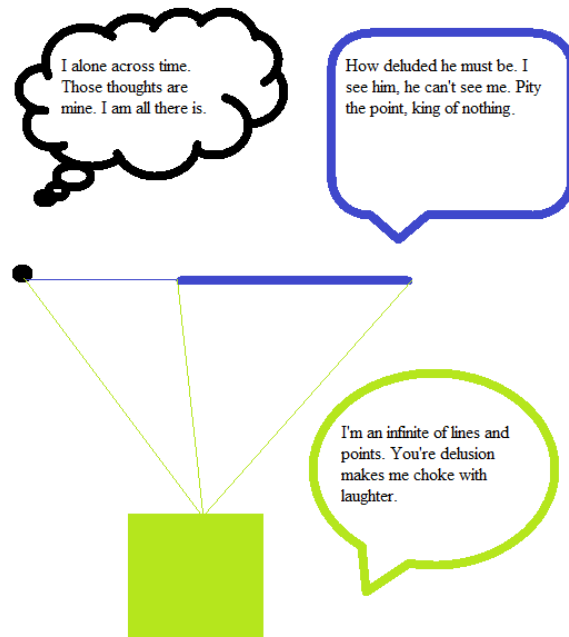


Figure 16 Here the delusion of relying on one's knowledge to fully comprehend anything is depicted, alongside the way a being sees, relative to the dimension it occupies. The king of Pointland, despite being an infinite being, exists only temporally, and not spatially, thus he is incapable of thinking anyone but him exists.

Even when he hears the higher-order shapes speak; he assumes those thoughts to be his as in his world he is all there is and will be. Thus, from this graph, the relationship between humans and the unknowable can be clarified

From the graph, we can deduce that the monarch of Pointland, a dimension with no spatial freedom, is all there is within his world, a false god that paradoxically exists both as the sum of an infinite number of attributes, and a speck of nothingness when compared to an object possessing one or more spatial dimensions.

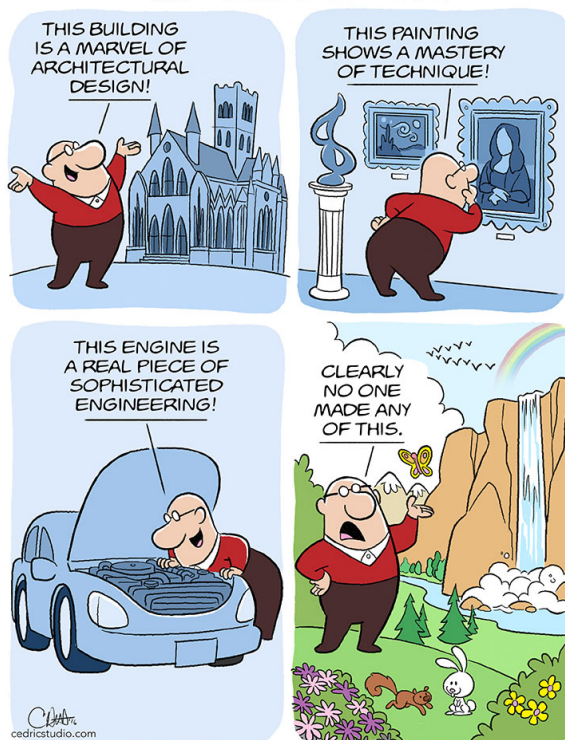
If a higher dimensional lifeform were to communicate with the monarch of Pointland, he would erroneously believe that those communications to be his thoughts, as he is all there is within his world and would be unable to conceive of anything else.

Therefore, through this analogy, it is possible to prove that there exist vast areas that not only will never be known but cannot be known as they would too alien for 3-dimensional, temporal beings such as humans to conceive them.

Thus, it is the paradoxical notation that a point can represent both an infinity, and nothingness when compared to higher-order objects, that proves that God cannot be comprehended, and must transcend comprehension. As such, God is incomprehensible and transcends all knowledge.

God has Agency and Transcends Free Will ($\aleph_{(A,a,\emptyset)} \in \Omega, \Omega \gg \aleph_{(A,a,\emptyset)}$)

ATHEIST LOGIC



While the previous five notions may prove the presence of a Supreme Force, the Supreme Force must also be proven to contain consciousness, and be able to act on its own, not blindly as in the case of the natural forces which exist within the universe such as electricity.

Yet if that were the case, the universe itself would have not been able to exist as an organized system, as a system with an order in it would also have to have a less than infinite thermodynamic equilibrium.

Figure 17 A cartoon depicting the absurdity of atheism. While the man doesn't believe paintings, cars, and buildings can self-assemble, he does believe that lightning struck a primordial goop that evolved into humans, and assembled the car, building, and painting. (Social Anxiety Forum).

Simply put, for an ordered system to arise out of a disordered state, a complex mechanism must create it, much in the same way a complex computer can only be built by humans, which themselves are complex. While it is absurd to think that computers can build themselves, it is equally absurd to think that self-replicating cells, much more complex than computers, were created by the application of energy to primordial ooze####.

According to Miller, Abiogenesis states that the organic life found on earth arose from simple organic molecules, and energy. It is also important to note that the Miller-Urey experiment, an experiment which purportedly claims to prove abiogenesis, failed in the production of any self-replicating cells, or proto-cells.

Thus, for the universe to exist, along with life, God must have willed it into being. Therefore, God must have agency over Himself and must transcend the human concept of free will.

God is Singular, All Belong to Him ($\aleph \in \Omega, \aleph \approx \Omega, \aleph < \Omega, (\aleph : \Omega) = (0 : 1)$)

Throughout much of history, men have worshipped many gods instead of one. While polytheism itself is a form of theism, it mathematically produces infinitely weak gods, instead of one Absolute God.

Mathematician Georg Cantor defined the Absolute infinite as the set which contains all other sets, be they finite, infinite, or transfinite. Since there is only one set that contains all the other sets, without itself being contained, there must only be one absolute Omega set, which can be visualized geometrically as a Great Chain of Being. A chain which starts from the lowly point which represents nothing to the higher powers which represent something, which comes together which make the Omega set, the set which contains all of something, and all of nothing, to which when compared to it, something, will always be nothing, no matter how great.

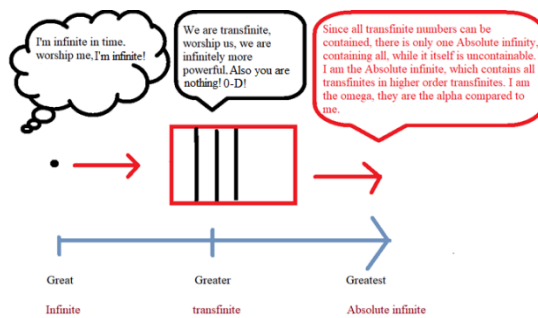


Figure 18 Here the relationship between infinite, transfinite, and Absolute sets can be depicted. The point, despite being an infinite number of attributes, is quite literally a 0-D nothing when compared to the transfinite segments. Yet the segments themselves are not the Absolute infinite as they can be contained by a higher-order transfinite plane, which itself can theoretically be contained by a cube, ad infinitum until an uncontained Absolute set is reached.

Thus, through a thorough exploration of the mathematical Great Chain of Being, it can be concluded that an absolute God must be singular, with all others being nothing when compared to Him. Therefore, God must be singular, and all belong to Him.

Conclusion ($P(\Omega) = 1$)

As such, given the massive quantity of evidence, the theistic position is a firm explanation regarding the genesis of the cosmos. A position that makes the current atheistic cosmological theories as obsolete as the other superseded scientific theories in history's garbage bin. Theories ranging from the comical flat-earth theory to the outright insane *Glazial-Kosmogonie*^{§§§§§} (Glacial Cosmogony) theory proposed by Austrian Hanns Hörbige

§§§§§ Ley states that Glazial-Kosmogonie theory proposes that cosmical objects such as the moon, and sun are made of ice. Although never given much credence, Hörbiger's theory was propped up by the Nazi Third Reich as an alternate theory which proved the superiority of the Nordic man and his frozen habitat.

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Gravitational Assist: Concepts, Applications, and 2-Dimensional Mathematics by Ian Schiess

Abstract

The enormous wealth of the universe lies in the knowledge that humankind can gain by exploring it. Unfortunately, traversing the vast expanse of space requires quantities of energy that dwarfs what a reasonable amount of fuel can provide via current propulsive systems. Thus, gravitational assist was developed to provide the remainder of the energy required (Bryan, 2010). A gravity assist maneuver (GAM) is where a spacecraft travels past a celestial body, using the pull of gravity to “slingshot” past at a higher velocity than it approached at (NASA, n.d.). Numerous missions have been made possible using GAM’s, such as Voyager 1 and Voyager 2, which have both entered interstellar space and are the farthest human-made objects from Earth (NASA, 2018). Mathematical calculations for gravity assist trajectories are often too complicated for human calculation and, as such, are left to advanced computer simulations. However, simplified gravity assist maneuvers are rooted in foundational physics and are within the scope of the paper. The use of gravity assist is integral to the success of long-distance space travel and is essential to humankind’s exploration and understanding of the universe.

Gravity Assist Conceptual Fundamentals

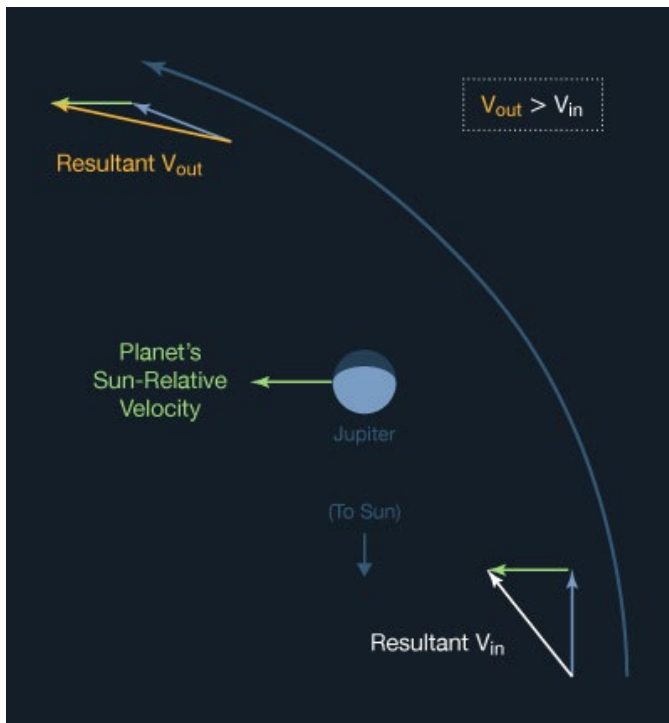
Often noted as “the final frontier,” space travel is the apex of humanity’s technological challenges and the only endeavor that is seemingly infinite. Even the exploration of Earth’s planetary backyard, the solar system, displays a multitude of challenges that dwarf expectations and require advanced solutions. The vastest among these challenges, the great boundary that divides the knowledge of the universe and human understanding, is sheer distance.

The distance between planets in the solar system presents a host of unique challenges, including fuel cost and time. As stated by Shortt (2013), launching extra fuel into space for a mission is exponentially expensive, and any reasonable amount of fuel is inadequate for interplanetary space travel via current propulsive systems (Bryan, 2010; Konstantinov, 2014). Luckily, however, spacecraft can borrow energy from large celestial bodies (such as planets or moons) with a maneuver known as a gravity assist. The gravity assist technique, described by NASA (n.d.), can utilize a celestial body’s enormous angular momentum to add or subtract momentum from a spacecraft’s orbit. Usually, GAMs are utilized to propel a spacecraft away from the Sun faster than its launch vehicle is capable.

A GAM is accomplished when a spacecraft approaches an orbiting body without hitting or becoming stuck in orbit around the body. The spacecraft will then either gain or lose momentum. Conceptually, gravity assist can prove tricky and counterintuitive to understand, which can persist even with some knowledge of physics (NASA, n.d.). Using conventional logic, the spacecraft, traveling at an initial velocity V , should increase in speed as it falls towards the planet/moon. Then, as the spacecraft starts to escape the planet’s influence, the craft’s velocity should decrease back to V . The encounter from the

planet's point of view leaves the spacecraft with zero net change in velocity, or ΔV (Shortt, 2013).

The key to understanding gravity assist is understanding reference frames, mainly a "Sun frame" and a "Planet frame," which specify the point from which velocity is measured. In the planet frame (velocity relative to the planet's motion), the spacecraft does not gain any total speed in the encounter. However, from the Sun frame, the planet in question has massive angular momentum, some of which can be transferred to the spacecraft, increasing the ΔV of the encounter with respect to the solar system (Shortt, 2013 par. 9; NASA, 2018 c). Figure 1 is provided by NASA (n.d.) and demonstrates the velocity change throughout a GAM.



A crucial variable of GAMs is the direction of approach that the spacecraft follows relative to the celestial body's velocity vector. The angle of approach influences both the deflection of the resultant velocity from the original velocity vector and the ΔV gained from the maneuver.

Fig. 1

Deflection

Deflection is the change in the direction component of the resultant velocity vector from the velocity vector of the spacecraft before the encounter (V_{is}). The

path of a spacecraft throughout a GAM is usually hyperbolic in the planet frame, with the curvature being proportional to the minimum distance between the spacecraft and the planet (miss distance) (Konstantinov, 2014). As such, very small deflections of near-zero degrees are related to wide misses, while larger deflections with a maximum of 180 degrees are possible with closer approaches (Shortt, 2013).

Velocity Yield

The amount of velocity that a spacecraft gains from a GAM is proportional to the miss distance and the deflection. For instance, when Voyager 2 passed by Jupiter, it experienced a deflection of around 90 degrees from the planet frame and gained approximately 60% of the planet's angular velocity (Shortt, 2013). A positive velocity gain occurs when the spacecraft crosses the trailing-side of the planet. On the contrary, a

spacecraft loses heliocentric velocity by crossing the leading side of the planet (Bryan 2010).

As both the magnitude of deflection and the magnitude of velocity gain/loss is proportional and scalable with the approach vector of the spacecraft, these quantities are “practically free” with the correct timing and precision. The precision required is often gained via the use of a computer program to synthesize a flight path, which will be discussed later (Bryan, 2010 p.3).

According to Newton’s second law, the planet which imparts motion on the spacecraft should also experience a force in the opposite direction, thus slowing down. However, the amount that the planet slows is negligible due to its’ large mass. Conversely, since the spacecraft’s mass is light compared to the planet, the velocity imparted on it is usually in sizable quantities (Bryan, 2010).

Currently, GAMs allow the completion of the objective with much less fuel, and therefore a much cheaper rocket. With the use of gravity assists, launching a payload deep into space is more about precision and timing than the amount of thrust. Plotting these trajectories requires complex and robust computer simulations are often used to optimize launch times and flight paths.

Examples of Gravity Assist Use

As a practically free option for drastically increasing or decreasing a spacecraft's speed, gravitational assist maneuvers are used in various applications. These applications extend not only to interplanetary or possibly interstellar travel but to more local objectives as well. In 2020, NASA's Artemis 1 will travel to the moon, orbit for a short period, and then begin a return journey. For the insertion of Artemis 1 into a distant retrograde orbit (opposite the direction of the moon’s rotation.), a leading side lunar GAM will be used to slow the craft. Likewise, for the return journey, a trailing side GAM will be used to accelerate the craft (NASA, 2018 a). Lunar gravity assists are also made on other planets, usually for insertion into an orbit for which the initial velocity of the craft is too high, thus requiring a deceleration.

For journeys from the Earth to more distant places in the Sun’s gravity well, such as Jupiter and beyond, gravity assists are often a necessity to gain the required momentum to reach the destination. When the target destination is especially far, multiple GAMs are chained together. NASA’s Galileo spacecraft took one boost from Venus and two from Earth on the way to Jupiter. The Cassini spacecraft used two assists from Venus, one from Earth, and another from Jupiter to reach Saturn (NASA, n.d.; NASA, 2018 c).

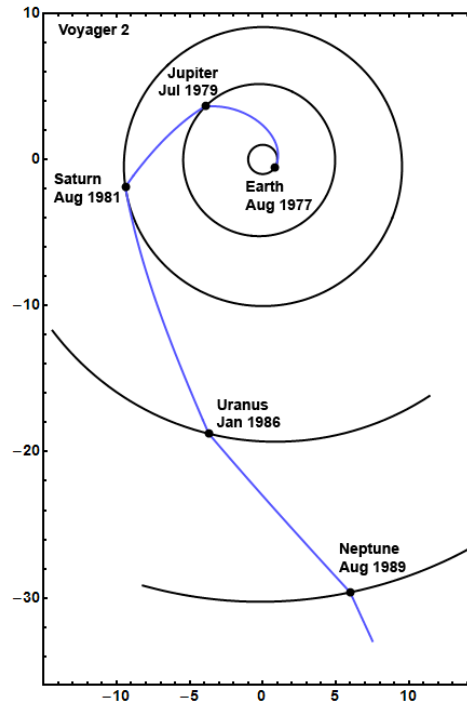
The most classic examples of GAMs utilized for interplanetary space travel are Voyager 1 and Voyager 2, which are the farthest human-made objects from the Earth. The Voyager 2 spacecraft, as of November 5, 2018, joined Voyager 1 in exiting the heliosphere (the Sun's protective magnetic field) and therefore entering interstellar space (NASA, 2018 b). In a remarkable testament to the utility of GAMs, the Voyager 2 spacecraft only held enough initial momentum to reach an aphelion (furthest point in an orbit from the sun) of

around Jupiter's orbit or 5 AU (750,000,000 km from the Sun) (NASA, n.d.). Due to gravity assists taken from Jupiter, Saturn, Uranus, and a slight decelerating gravity assist at Neptune, the Voyager 2 spacecraft gained a total of 15 km/s from gravity assists alone including the 2 km/s loss from the slight leading side assist at Neptune (Shortt, 2013). Figure 2 shows the gravity assists taken by Voyager 2 and is provided by (Shortt, 2013).

Fig. 2

Computer Synthesis of Flight Paths

Flight trajectories with multiple gravity assist maneuvers rely on the tracking and calculations of various orbits, speeds, accelerations, vector directions, and more. Thus, the method most commonly used for trajectory synthesis of such a flight path is to rely on a robust computer program. A computer program that is both robust and complex enough can run through many thousands of flight trajectories, selecting those that are most optimized (Golubev et al., 2017; Bryan, 2010).



A scenario that is fully representative of the complexity of multiple GAM trajectories is landing a craft on one of Jupiter's moons. Initially, a spacecraft must be given the proper velocity to reach Jupiter's orbit via multiple gravity assist maneuvers. Once reaching Jupiter, a leading side GAM is necessary to slow the craft for insertion into Jupiter's orbit (NASA, n.d.). Then, several additional GAMs are performed to insert the craft into the orbit of the moon, from which a landing system is activated (Golubev et al., 2016). With the previously mentioned variables, a trajectory that requires such precise timing and calculation is too complex to be synthesized by human hands. Thus, thoroughly displaying the necessity for advanced computer programs that use brute force to synthesize an optimal trajectory (Bryan, 2010).

2-Dimensional Mathematics

A mathematical approach to determining the final velocity vector of a spacecraft post-GAM with a few given mission parameters involves the use of 3-dimensional calculations with high complexity. While 3-d calculations are essential given the precision necessary for space travel, an approximate solution is possible utilizing a two-dimensional model (Michele, 2013). A two-dimensional GAM consists of the spacecraft's hyperbolic trajectory, and the planet's circular orbit around the sun, which are assumed to be coplanar. The main goal of trajectory synthesis is the calculation of $\Delta \mathbf{V}$ for the craft, which is simply the final velocity of the craft (\mathbf{V}_{sf}) minus the initial velocity of the craft (\mathbf{V}_{si}) and

is indicative of the momentum exchange between the planet and the spacecraft (Golubev et al., 2015). In addition to $\Delta \mathbf{V}$, deflection(ϕ_{sf}), which defines the angle that the spacecraft's final velocity vector deviates from the original path, is another critical variable.

For the following trajectory synthesis method, provided by Michele (2013), several vector decompositions and additions are made with the consideration of eccentricity to find the final deflection angle and $\Delta \mathbf{V}$. The given quantities required for the solution are as follows: orbital angle (ϕ_p) and velocity (\mathbf{V}_p) of the planet, the gravitational constant of the planet (\mathbf{GM}), angle of approach (ϕ_{si}) and initial velocity of the spacecraft (\mathbf{V}_{si}) and miss distance (\mathbf{d}). Figure 3 is provided by (Michele, 2013).

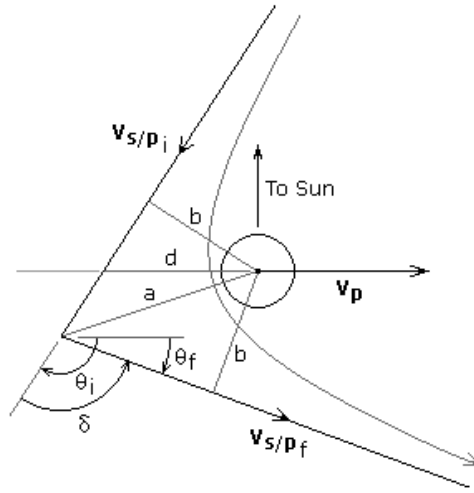


Fig. 3

Step by Step Solution

The first step in finding an approximate solution is to break down \mathbf{V}_p and \mathbf{V}_{si} into vector components using ϕ_p and ϕ_{si} , respectively. Then \mathbf{V}_p is subtracted from \mathbf{V}_{si} to find the relative initial velocity of the spacecraft to the planet ($\mathbf{V}_{s/pi}$).

$$V_p = (V_p \cos \phi_p)x - (V_p \sin \phi_p)y$$

$$V_{si} = (V_{si} \cos \phi_{si})x + (V_{si} \sin \phi_{si})y$$

$$\frac{V_s}{p_i} = ((V_{si})_x - V_{px})x + ((V_{si})_y - V_{py})y$$

$$\frac{V_s}{p} = \sqrt{\left(\frac{V_s}{p_i}\right)_x^2 + \left(\frac{V_s}{p_i}\right)_y^2}$$

Then the initial velocity's angle from the horizontal (θ_i) is found using the vector components of \mathbf{V}_{si} .

$$\theta_i = \arctan[(V_s/P_i)_y / (V_s/P_i)_x]$$

Using \mathbf{d} , \mathbf{GM} , \mathbf{V}_∞ , and θ_i , the constants \mathbf{a} and \mathbf{b} are found, where \mathbf{a} is the distance from the vertex to the center, and \mathbf{b} represents distance from the transverse axis/vertex intersection to the asymptote lines of the hyperbola. The constants \mathbf{a} and \mathbf{b} are then used to find the eccentricity (\mathbf{e}) of the hyperbolic, open orbit. \mathbf{V}_∞ is the magnitude of the asymptotic velocity vector. (Note that $\mathbf{V}_\infty \approx \mathbf{V}_{sp}$)

$$b = d \times \sin \theta, \quad a = -GM / V_{\infty}^2, \quad e = \sqrt{1 + b^2/a^2}$$

Eccentricity is used to solve for the angle between the final and initial velocity vectors (δ). Then the angle between the horizontal and the final velocity vector (θ_f) is obtained.

$$\sin(\delta/2) = 1/e, \quad \theta_f = \theta_i - \delta$$

The final step is solving the final velocity and the magnitude of the final velocity. Comparing the results with the initial velocity vector provides insight into the momentum exchange between the planet and the spacecraft.

$$\begin{aligned} V_{S/Pf} &= (V_{S/P} \times \cos \theta_f)X + (V_{S/P} \times \sin \theta_f)Y \\ V_{Sf} &= ((V_{S/Pf})_X + V_{Px})X + ((V_{S/Pf})_Y + V_{Py})Y \\ V_{sf} &= \sqrt{(V_{sf})_x^2 + (V_{sf})_y^2} \end{aligned}$$

(All above equations provided by (2013))

Additional considerations for parameters when regarding a GAM impose logical constraints upon calculations. For instance, the maximum deflection of a GAM is 180 degrees (Shortt, 2013). Additional to maximum deflection, the miss distance of the spacecraft (d) cannot be less than the radius of the planet in question (R_{pl}). Since the ΔV of a spacecraft undergoing a GAM is directly proportional to the miss distance, the radius of the planet creates a maximum change in velocity, or ΔV_{max} (Golubev et al., 2015).

$$\Delta V_{max} = \sqrt{\frac{GM}{R_{pl}}}$$

Conclusion

With the limitations of current propulsion systems leaving them unfit for interplanetary or interstellar space travel on their own, the development of gravity assist maneuvers is a testament to the innovation and creativity of humankind. The efficiency of GAM's for long-distance space travel is thoroughly demonstrated by Voyager 1 and 2, while the utility of GAM's for short-distance space travel is confirmed by missions such as NASA's upcoming Artemis 1. Utilizing GAMs has granted astronomers, engineers, and the like with vital information of what lies beyond the atmosphere, bringing humanity ever closer to the final frontier. Even if, in the future, gravity assist maneuvers are retired in favor of more effective technologies and techniques, they will remain the first innovation to carry humanity's influence through the harsh void of interplanetary space. Just as sailboats revealed humankind's limits beyond the seas, the Wright brothers' creation showed new limits beyond the skies. Likewise, gravity assist maneuvers and the technology associated with them expose that the true limits lie beyond the stars.

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Concealed Carry on College Campuses by

Matan Siskand

Violent crimes on college campuses have been an issue in the United States for decades, but with several well-publicized tragedies taking place in recent years, the debate surrounding campus safety has gained significant momentum and typically arrives at the topic of concealed carry on campus. Regulations regarding concealed carry permits are determined at the state level. All fifty states permit citizens to conceal carry but with varying provisions, specifically in regarding concealed carry on college campuses (Siegel et al., 2017, p.1). After the 2007 Virginia Tech massacre, in which thirty-two individuals were gunned down by a current student, numerous attempts have been made to amend state laws prohibiting concealed carry on campus (Webster ScD, MPH et al., 2016, p. 5). According to the National Conference of State Legislatures (2018), sixteen states explicitly ban concealed carry on campus, twenty-three states leave the decision up to the academic institution, and eleven explicitly permit concealed firearms on campus (NCSL, 2018).

There are two contrasting theories surrounding the discussion of concealed carry on campus. Opponents argue that it would reduce campus safety and lead to an increase in violent crimes; proponents opine that concealed carry would allow individuals to protect themselves and others, resulting in higher levels of public security (Cramer & Burnett, 2012, p. 17). Concealed carry on campus is a controversial and highly debated topic. However, comprehensively examining the data, research, and real-life examples pertaining to concealed carry on campus provides abundant evidence that its presence renders students safer and incidents such as the Virginia Tech massacre less likely to occur.

Opponents argue that the college-aged population engages in a significant amount of high-risk behavior, specifically irresponsible consumption of alcohol, and therefore, allowing students to carry guns on campus would result in higher rates of violent crime. “Relevant to this discussion is the frequency and nature of events where civilians might use firearms at their disposal ... the frequency of binge drinking of alcoholic beverages among college students and the violence that stems from that drinking.” (Webster et al., 2016, p. 16). Superficially, the opinion of Webster and co-workers appears logical, but fails to consider an essential aspect of the concealed carry on campus discussion: to obtain a concealed carry permit one must be at least twenty-one years old. A study published in the *American Journal of Public Health* by JS Baer et al. (2001) found a gradual decrease in heavy alcohol consumption amongst students as they progressed through their college years. Furthermore, Fromme Ph.D. et al. (2010) conducted research that found a significant decrease in the amount of alcohol consumed by college students ages twenty-one and older. “Although our findings also indicated that legal-age drinking occurs as frequently as underage drinking, the fact that it involves lower amounts of alcohol per drinking occasion may be a safer style of consumption” (Fromme et al., 2010, p. 25). In all

fifty states, individuals must be at least twenty-one to acquire a concealed carry permit. Therefore, the only relevant group to consider are upperclassmen, raising doubts concerning the claims made by Webster et al., and others of a similar nature. In addition to irresponsible alcohol consumption, opponents of concealed carry on campus often claim that most college students would feel less safe with guns on campus. In an article entitled "Student Perceptions and Practices Regarding Carrying Concealed Handguns on University Campuses" Thompson, PhD et al. (2013) surveyed 1,800 college students concerning the topic of concealed carry on campus, on which 75% of students either agreed or strongly agreed that "if a state law was passed permitting students to carry concealed handguns on campus, it would likely result in a higher rate of fatal homicides on campus" (Thompson, et al., 2013, p. 250). Whereas students' sense of safety is a consideration in the discussion, there is no evidence to conclude that concealed carry on campus would result in higher rates of violent crime. Decisions on this emotionally charged topic ideally should be based in empirical data, not on subjective fears. Colorado is one of the only states that has successfully enacted this highly controversial legislation allowing concealed carry on campus in recent years, and is, therefore, one of the only states where an examination of its risks versus benefits might be determined. In 2003, when the new Colorado statute became active, the state's two largest universities reacted in opposing manners. While Colorado State University accepted the new law and began permitting students to conceal carry, the University of Colorado, through action by its Board of Trustees, implemented a college-wide policy specifically prohibiting permit-holding students from carrying concealed firearms on campus (Cramer & Burnett, 2012, p. 16). The University of Colorado's decision ignored state law and provoked legal action being taken against the institution. In fact, one of the principal plaintiffs in the legal proceedings was the County Sheriffs of Colorado, the primary body responsible for Colorado's public safety. In its amicus brief, the County Sheriffs of Colorado, which represents all sixty-two county sheriffs in the state, urged the courts to find the University of Colorado guilty of violating state legislation. The brief included evidence supporting the benefits of the state's Concealed Carry Act and questioned the University's authority on this matter: "In contrast, the university has no expertise in firearms safety. The County Sheriffs of Colorado does have such expertise" (University of Colorado, et al. v Students for Concealed Carry on Campus, LLC et al., 2011, p. 15).

Among the claims made by the Colorado Sheriffs was their experience that allowing students to conceal carry on campus does not pose a risk for a rise in campus crime, as permit holders are incredibly law-abiding, which does not suddenly change when they are on campus, "These good citizens, ... do not suddenly turn into unstable sociopaths when they set foot on the campuses of the University of Colorado" (University of Colorado, et al. v Students for Concealed Carry on Campus, LLC et al., 2011, p. 5). The Sheriffs' statement is backed by crime statistics collected by Cramer and Burnett in their report titled "Tough Targets: When Criminals Face Armed Resistance from Armed Citizens" (2012). Cramer and Burnett found that in the five-year time frame following the enactment of Colorado's 2003 conceal carry law, Colorado State University, allowing

concealed carry on campus, experienced a 60 percent decrease in overall crime, while the University of Colorado, prohibiting on campus carry, witnessed a 35 percent increase in crime during the same time period (Cramer & Burnett, 2012, p. 17). While there are a variety of factors contributing to the disparity in crime rates at these institutions, the notion that permitting concealed carry on campus results in higher rates of violent crime, as 75% of students believed in Thompson et al. (2013), is not confirmed by the real-life Colorado example.

To predict the potential outcomes of concealed carry on campus, the firearm behavior of actual permit holders must be evaluated. In his 2017 research entitled "Concealed Carry Permit Holders Across the United States" John Lott, PhD examined more than two million gun permit holders over nearly three-decades, and found evidence that concealed carry on campus is unlikely to result in higher rates of gun violence (Lott, 2017, p. 7). Lott's study, which would later be cited in a U.S. Supreme Court brief (2017), found that between 1987 and 2015, Florida has issued 2.64 million permits, with only 168 revocations (Lott, 2017, p. 7). Roughly a 0.006% revocation rate was seen during the twenty-eight-year period, with most being the result of accidental carrying in a gun-free zone, not threats or acts of violence (Lott, 2017, p. 7). Lott's research (2017) also includes firearm violations by police officers between 1987-2015, calculated to be .007%, a figure marginally higher than that of concealed carry permit holders (Lott, 2017, p. 9).

Concealed carry on campus is a complex and highly controversial topic that is currently being debated in state legislatures across the country. Despite prior arguments made by its opponents, often based on subjective fears, the available data appears to support the proponents of concealed carry on campus. The opinions of public safety experts and the studied behavior of permit holders indicate that allowing concealed carry on campus results in increased campus safety. Colorado's real-life concealed carry on campus data found by Cramer & Burnett (2012), together with Lott's 2017 report, appear to demonstrate that permit holders are law-abiding, and remain so when permitted to carry firearms on campuses, as predicted by the County Sheriffs of Colorado (2009). Based on the available data, it is reasonable to conclude that comprehensive bans of concealed carry on college campus may be misguided and should be reexamined.

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Picture Books for Grown Ups: Should Graphic Novels be Considered Legitimate Forms of Literature? By Hadley Strainge

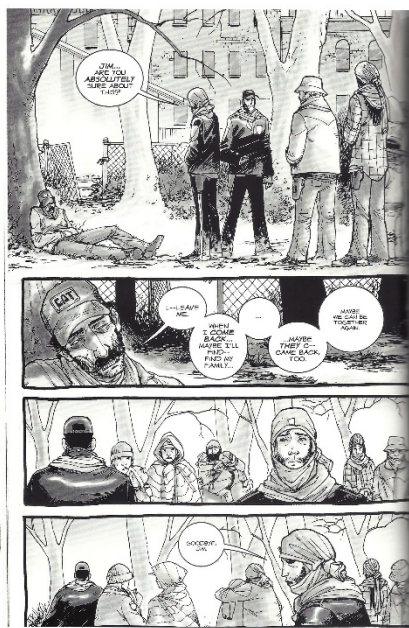
Sequential art and comic books have always been a decidedly American form of storytelling. They are woven into our national identity, having appeared in newspapers since the 1800's and been used to tackle important issues facing our country and our place in the world. While many people see sequential art as just a way to tell stories about superheroes and nothing more, the pioneers of the graphic novel industry have used them to tell stories covering the same deep and compelling themes that traditional novels do. Graphic novels also offer cross discipline learning opportunities, and for many, are a more accessible medium than traditional novels are. For this reason, graphic novels should be regarded with traditional novels as pieces of literature, and even in some cases, used in the classroom as part of history, English, and literature curriculums.

Comic books, as we know them today have existed in American culture ever since the 1930's when the first proper comic book superhero was introduced in 1934 (Comic Books and Graphic Novels). Since then, superheroes and supervillains have taken a hold on the American consciousness. During the Marvel Renaissance in the 1960's, with the creation of such beloved characters as Spider Man, Thor, and the Hulk, Stan Lee helped to revitalize the comics industry (Comic Books and Graphic Novels). A new form of sequential storytelling would emerge in 1978 when Will Eisner published what is regarded as the first intentional graphic novel, *A Contract With God* (Eisner Studios, Inc). Eisner's novel tells four separate stories of Jewish families living in a poor New York City neighborhood, and deals with themes of death, suicide's effect on a family, disenfranchisement, and the class divide of the 1930's (Eisner Studios, Inc). Eisner went on to help popularize the term "graphic novel," which generally is used to include novels in a comic-strip format, that go beyond science fiction or fantasy, and include biography, history, memoir, and other nonfiction and some fiction subjects (Research Guides). This was not the first time the term "graphic novel" had been used before, but the popularity of *A Contract With God* helped the case for the term to become more widely used (Eisner Studios, Inc).

In 1986, Art Spiegelman's *Maus* was published, once again propelling graphic novels onto the major stage (Ray). *Maus* tells the story of Spiegelman's father, who survived the Holocaust, through images of the Jewish people as mice and the Nazi regime that was hunting them as cats. This combination of clever visuals and moving storytelling helped to earn *Maus* the 1992 Pulitzer Prize, the most prestigious award for literature in the United States. Past winners of the Pulitzer include authors such as Ernest Hemmingway, Toni Morrison, Alice Walker, and Margaret Mitchell. The inclusion of *Maus* in the leagues of some of the best and most celebrated American literature furthered the case that graphic novels are a form of complex literature just like traditional novels (Ray). *Maus* was the first and only graphic novel to win a Pulitzer, and since then has been included in literature and history circles as a method of studying the horrors of the Holocaust. *Maus* has been compared to Elie Wiesel's autobiographical novel *Night*, which also documents the Holocaust through Wiesel and his father's own eyes. Opponents of including graphic novels in the circles of traditional literature argue that, due to the addition of the pictures, *Maus* is too violent to be used as a primary source for the study of the Holocaust. Some also say that the fact that *Maus* is a graphic novel makes it too "low brow" of a novel to be included alongside *Night* or other firsthand accounts of the Holocaust. There are hundreds of books, movies, and television documentaries that show what actually happened during the Holocaust in more graphic detail than *Maus* does, and many reviews of the novel say that the cat and mouse images used in the novel helped to distance the reader from what happened without removing the reader entirely from or distracting from the story. The Washington Post's Michael Canva even goes as far as to say that *Maus* still remains the "greatest graphic novel ever published," and says that the story couldn't have been told through any other medium than the graphic novel (Canva). The inclusion of a graphic novel in the study of history, especially of an event that changed the world as we know it like the Holocaust did, is the best evidence that graphic novels are similar to traditional literature and should be regarded as such.

More recently, graphic novels and their television adaptations have gained major commercial success in pop culture circles outside of the insular graphic novel community. *The Walking Dead*, a post-apocalyptic graphic novel centered around a group of misfit survivors fighting zombies created by Robert Kirkman, was turned into an AMC television show that has achieved massive critical success. The television adaptation of *The Walking Dead* has become a cult television phenomenon and has even enjoyed better success in its ratings during some of its

seasons than HBO's wildly popular series *Game of Thrones* (Katz). Both *Game of Thrones* and *The Walking Dead* started off as pieces of literature, and both series of novels tell relatable stories in a unique way. The series of novels *Thrones* was based on, *A Song of Ice and Fire* written by George R.R. Martin, uses a fantasized version of actual British history to tell a very human story of moral ambiguity, finding yourself even under the worst of circumstances, and explores the idea of "duty versus loyalty" over the course of its five books. *The Walking Dead* explores these same ideas throughout the three main books, using a fictionalized version of Atlanta, Georgia as its backdrop instead of feudal England, and images to tell its story along with words. Those who are against graphic novels as literature say that action and adventure graphic novels like *The Walking Dead* couldn't possibly tell the same kinds of stories as traditional action and adventure novels do, because the addition of the pictures takes away from the story that is being told. The story should take center stage, and in *The Walking Dead's* case, the story still is the main focus of the novel. The pictures aid in the telling of the story, and add a second layer of complexity to the story that moves the narrative along in the same way the words and descriptions of the events in *A Song of Ice and Fire* do. The commercial success of *The Walking Dead* along with the historical precedent set by other titans



of the genre, clearly show that this form of storytelling is on par with other forms of literature and should be included alongside their traditional novel counterparts.

Many opponents of graphic novels say that graphic novels which are heavily genre fiction, meaning sci-fi, horror,

and fantasy novels, don't have any literary merit, as they are just overcomplicated picture books for adults. Going back to *The Walking Dead*, much of the series' plot is based in the conflict of man versus nature, and the ideas that circumstances will change your morals and values. Throughout the novels, the survivors' morals slowly erode as the only thing they need to focus on is survival. One beloved and

heart-wrenching example of this from the first book of *The Walking Dead* is when one of the original survivors, Jim, gets bitten by a ‘walker,’ one of the zombie creatures infesting Atlanta while defending the other survivors (Kirkman). He knows that he is turning into a walker because of the bite, and that keeping him alive or around the group will mean the possible demise of the group (Kirkman). Jim and the other survivors argue for a few pages over what to do with him, because he can’t stay with them any longer, but no one wants to be responsible for his death (Kirkman). Donna equates leaving Jim for dead to be murder at one point, which in any normal circumstances, it absolutely would be (Kirkman). In this changed reality, however, the group must think about the people that they *can* save, not what would be morally or ethically right in the world they left behind (Kirkman). Eventually, at Jim’s insistence, they come to the compromise to leave him in the forest to die, so that none of them actually end up killing him, and eventually he will become one of the zombies they are trying to protect themselves from (Kirkman). Each of the main characters has internal conflicts like this throughout the whole series. Rick Grimes, the main character, struggles with how much violence he should be showing his young son, and another major character, Morgan Jones, struggles with the morality taking so many lives. All three of these examples point towards *The Walking Dead* being a piece of naturalist literature similar to *Lord of the Flies* or *The Old Man and the Sea*.

Other fields outside of the stereotypical communities graphic novels are associated with are taking notice of their popularity. Sales of graphic novels increased by almost 400 percent between 2001 and 2006, and these numbers only continue to climb (Comic Books and Graphic Novels). Many educational curriculums are also taking notice of the popularity of graphic novels, including the Maryland Department of Education, who introduced a graphic novel curriculum to teach reading to students in 2004 (Comic Books and Graphic Novels). Opponents of this program say that graphic novels are “nonsense” and “more about teachers trying to be trendy” than them teaching their classes about literature (qtd. in Comic Books and Graphic Novels). Many opponents, educators and parents alike, also say that including graphic novels in educational settings is almost redundant because if graphic novels are the new wave of literature, most students will be reading them at home anyways (Comic Books and Graphic Novels). While readership of graphic novels among younger readers did rise over 58 percent in 2018 according to Publisher’s Weekly, many teachers who have implemented graphic novels into their curriculums argue that the novels children are reading outside of school are not of the caliber that will be studied in the

classroom (What We Know). Novels like *Persepolis*, *Blankets*, and *Watchmen* are staples in graphic novel classrooms, all with their own literary merit and value beyond the genre of the graphic novel and the specific stories they tell (Comic Books and Graphic Novels).

Graphic novels and comic books have stood the test of time in American culture. Their impact in both the readers who know and love them and the world of popular culture outside of their fans is something that cannot be replicated, and a misunderstanding of the fundamentals of the genre has prevented them from being considered for their intrinsic literary merit. They offer a way to reach more people than traditional novels do, and they present the same subjects that many novels do in a way that is more accessible and easier to understand than traditional novels. Just because graphic novels have pictures in them does not negate the value they have to the culture of literature and American culture as a whole.

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The Caribbean Unification Project by Bentley Walker*****

The History of Caribbean Integration

Since the end of World war II, when Britain begun to consider allowing a path to independence for its colonies in the Caribbean, it was the dawn of a new world for the British Caribbean. In the centuries before that, The British Caribbean nations over the years had been subject to the desires and needs of their motherland, Britain, funding much of her major industrial projects. For much of this time, whilst under their care, it was reported that the British government did little to develop the political structure of the colonies because there were so many. As a result, the overall development of these individual countries was lacking. There were some countries that were in notably better conditions than others but nevertheless, if any of these nations were to have a fighting chance at attaining the often elusive goals of prosperity and growth, it was believed that they had to come together to achieve this (Will, 1991).

The Beginning

The idea of a Caribbean union started to float around about the same time the British were thinking of relinquishing its colonial rule. They thought that the best option to ensure the political and economic prosperity of the commonwealth Caribbean was to unite them as one (Springer, 1962). In fact, in the year 1938, in response to the revolts and strikes in the British island territories, the British formed the Development and Welfare Organization, which in turn gave way to the first intraregional agency created after called The Anglo- American Caribbean Commission. The other empires with colonies in the Caribbean, namely France and Netherlands, liked the idea of coordinating policies and looking at closer unions within the Caribbean region. As a result, the commission expanded significantly in 1944 and thus formed the Caribbean

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Commission. It was their initiative and actions that indirectly lead to the formation of the West Indies Federation, through coordinating policy, strengthening regional communication and promoting a regional outlook (Springer, 1962). As with any proposed idea, there were conflicting feelings on the matter, chiefly among West Indian Caribbean leaders who wanted independence solely for their own nations. Nonetheless, after about 10 years of discussion and setbacks, in 1958, the West Indies Federation was formed (Will, 1991).

The Development of CARIFTA

This however was very short-lived, ending in 1962, and its defeat was the result of the nationalistic tendencies by its leaders, ironically, those who had a hand in starting it (Will, 1991). As a result of these complications, the pioneering thought of a strong, United and Singular Caribbean died but some of its concepts were adopted on smaller scales. The Caribbean Development Bank (CDB) and the Caribbean Free Trade Association (CARIFTA) are some examples of the agencies formed either during the federation or after as a last effort to salvage working policies that may still be needed. CARIFTA in particular is a better example of an association that was formed in 1965 to preserve the idea of economic integration. It was patterned after the European custom union and the European Free Trade Association (EFTA). By 1968, the former British colonies had followed suit and joined in the creation of the Caribbean Free Trade Association (CARIFTA). The fundamental objectives of the union were primarily to encourage the kind of economic development that would produce high rates of employment, and secondarily, to reduce the region's external economic dependency, particularly from Britain.

The “seminal truth” coined by Gordon Lewis (as cited in Will, 1991, p.10) states that only a politically and economically integrated Caribbean would have the power to effect real positive change and protect itself from outside political and economic threats. Therefore, no matter the ongoing insularity and nationalistic inclinations, the truth was that the world sees the Caribbean region as one (Will, 1991). This truth was proven true when Britain entered The European Economic Community (EEC) in 1973. Consequently, The CARIFTA Member states realized that they would have lost market preferential treatment in Britain and its only recourse was to negotiate for associate member status in the EEC. However, if that were to ever happen, a singular economy and common market would have to be established. The extended hand for trade was suspended on the condition that the Caribbean had a more coordinated economic policy (Will, 1991). The fact of the situation was that the Caribbean market was very similar. The commonalities among the island nations were overwhelmingly parallel. The languages, race and even some cultural practices may have been different, but they all shared the experiences of slavery, colonialism and island living, very unique situations in comparison to the rest of the world that undoubtedly had profound influence in Caribbean societies today (Dowling, n.d.). Faced with this truth, the

Caribbean leaders responded to the change of international markets with the revision of the current Caribbean Free Trade Agreement. This new agreement would now guarantee an even greater regional connection than ever before (Will, 1991).

The Development of CARICOM

Therefore, it was that in the year 1973, after the signing of the treaty of Chaguaramas, an even closer union was established, albeit still limiting but a step in the right direction. This new initiative was called the Caribbean Community and the Caribbean common market (CARICOM). The principle objectives of CARICOM are to “promote economic integration and cooperation among its members, to ensure that the benefits of integration are equitably shared, and to coordinate foreign policy”. In so doing, they strive to: “improve standards of living and work, enhance levels of international competitiveness, produce economic leverage and finally, coordination of Member States’ foreign economic policies and enhance functional cooperation,” (Jamaica Information, n.d.) and (CARICOM, n.d.). 15 years after, with a further revision of the current treaty, the Caribbean single market and economy (CSME) was also officially created. These are the principles, goals and chosen strategy that govern the Caribbean today and currently the closest thing to a Caribbean Union there is. The ideals of CARICOM are desired, and while it has come a long way in achieving some amount of regional integration, it falls short and will so continuously in its effort to bring unity and policy harmonization within the Caribbean.

The Evidence

One of the signs of a failing Integration initiative is the significant lack of intra-regional trading. During the years of 2011-2016, an overwhelming 88% of CARICOM imports came from outside the region, with the only remaining 12% coming from within the region. The exports also reflect the same sad reality. During the same years, 85% of CARICOM exports were done outside the region (Caribbean, 2016). This is notably different when contrasted with a trade statistical report from the World Bank in the years prior. According to the report, in 1985, regional trade was 40 times higher than outside export, and this was during a time when exports were significantly rising. It was also reported that more removal of intra-trade barriers and a solidified common market would directly lead to lower prices of regional goods and services:

The decline in trade barriers should lead to an intensification of competitive pressures, and thus an improvement in the quality and quantity of the products of Caribbean firms. As a result, intra-regional exports would rise, nominal GDP would increase, and the price level would fall. While Caribbean firms would be more competitive on world markets. (p.31)

This finding also reaffirms that only a strong and united Caribbean region can keep up and stay resilient to an ever growing and changing world market (New Opportunities, n.d.).

Divided we fall, together we stand". These are the famous words known throughout the world, penned by various authors throughout our time. It is a commonly held principle that two is usually better than one and the greater the number the better; this was certainly true in the colonial era. The colonization era, a well-known era for most, especially throughout the recently independent Caribbean nations, was an era exhibiting the success of the very concept. Upon Christopher Columbus's discovery of the new world, Europe, a group of individual nations located in one geographical era, distinct in language and some culture, shared above all else, the advancement of their respective people. Together, they compromised with each other and came into agreement on how they were going to divide the lands of the new world and share among themselves. An example is the Treaty of Tordesillas, in which Spain and Portugal divided their share of the land in the Americas. They realized that if they were ever going to move forward in prosperity, it was important that they put their differences aside and focus on all the things that bring them together. Their decision, on the said principle, gave birth to a whole new world. One can see that at almost every level in the world, there are connections and organizations always being formed for the purposes of achieving a specific and unique goal. Countries collaborate with each other to achieve mutual goals and in many occasions, these are countries that share much history and cultures.

In 2018, it was found that The United States' neighbors, Canada and Mexico, collectively, received the largest percentage of US exports than any other country in the world. This is parallel to the imports; The United States also imports the most from its two neighbors collectively in comparison to other countries. This is no doubt a great contributor to the nation's economic success; the agreement between its neighbors that affords it the ease of transportation among other things (Trading, 2018). This however is not what exists among the nations of the Caribbean. While the US's exports the most to its neighbors collectively than other countries, a economic report by Trading economics (2017) showed that Jamaica for example, exported the most of its products to the United States, and other countries. St. Vincent and the Grenadines, a Caribbean country and CARICOM member state received only 0.16% of exports from Jamaica. Trinidad and Tobago received the highest amount of Jamaican exports at 1.3%, valued at 17m US dollars. It is an odd situation when two countries like the US and Mexico, with significant cultural, racial, and language divide can put aside these strong differences for the benefit of their citizens but Countries such as Jamaica and all other member states who share a significant and deep history, heritage and culture cannot do the same. Of all the resources traded out of the region, the human resources are the most precious. During the years of 1965-2000, from the collapse of the federation, countries gaining independence and the formation of CARIFTA, The Caribbean suffered a major unprecedented brain drain of an average 70%. Seventy percent was the average of skilled citizens leaving the Caribbean work force to join the workforce of other developed countries, particularly those in The Organization for Economic Co-operation and

Development (OECD) of which most European countries are members of and the US (Mishra, 2006).

In light of all this astounding data, it now begs the question of why CARICOM has not been as successful especially in the most recent years and what has created this artificial divide amongst such natural partners. Edward Seaga (2015) has the answer: “It became the syndrome of sleep. It has no economic value whatsoever. It just keeps putting forward new directions to grow, but nothing happens,” (as quoted in The Barbados, 2019). His words reflected sentiments shared by many Caribbean leaders both past and present. In January of 2020 upon US Secretary of State Mike Pompeo’s visit to Jamaica for bilateral talks, there was a growing concern nationally and regionally as to the nature of the US’s intention with this visit. It was suspected that Secretary of State Pompeo came to talk about matters such as foreign policy, in particular the current situation at the time, the legitimacy of the Nicholas Maduro as Venezuela’s President (Clarke, 2020). Amidst this concern, both nationally and regionally, Kamina Johnson Smith, Jamaica’s Foreign Minister stated that Jamaicans should remember that the understanding in CARICOM is that member states should work to coordinate foreign policy, and we do therefore collaborate on issues and consider each other’s positions, but there is no obligation to harmonize policy (Ministry, 2020). The Problem with that statement is that it is blatantly self-contradicting and wrong. As defined by the 11th edition of the Merriam Webster dictionary, the word “coordinate” means “to bring into a common action, movement, or condition” and the first listed synonym is “harmonize”. The stated objective of CARICOM is “the enhanced coordination of Member States’ foreign and foreign economic policies and enhanced functional cooperation.” If the Minister’s words were to be enacted in Jamaica’s foreign policy stance, in opposition to the coordinated and decided action of CARICOM, then Jamaica would have violated the treaty that it not only signed but also was instrumental in its development (CARICOM).

A Pilot Study

With all things therefore being taken into account, in as much as reviewing the Treaty of Chaguaramas, i.e., the treaty upon which CARICOM was formed, and after careful analysis of the regional trading statistics, overall development and regional perspectives, it appeared that the principle problem to the realization of Caribbean Prosperity and Unity was with its economic approach to issues that are largely sociological and thus political. In order to better isolate the root of the problem and how extensive the roots were, a survey was conducted. A sample size of 100 Caribbean-born people were surveyed, with respondents from 10 different Caribbean countries of 28. This was a pilot study done to assess the levels of regional awareness and identity in the hearts of the Caribbean people and what their sentiments might be to the idea of an even closer unified region. It should be noted that there are several limitations to this survey. Due to geographical factors, a majority of respondents were of Jamaican and Haitian nationality, 71% and 12% respectively. Being that there are 28 Caribbean nations, this

survey might not represent an accurate and complete view of the Caribbean people. Also, not all questions were answered by the overall total number of 100 respondents. It should also be noted that at this stage of the research, the Caribbean as a whole (not just CARICOM member states) is being looked at and factored in when discussing regional integration and unification. The results of the survey were interesting, and both confirmed the hypothesis made as well as showed unexpected findings. Nevertheless, this is only preliminary research and more research will have to be done. One thing however is clear and that there remains much work to be done in fostering the unity that CARICOM was to bring but with it also comes the hope of an ever-closer union.

Argument for Integration by the People

Shared History and Culture

The principle impediment to the realization of a strong, independent and prosperous nation is not the lack of Caribbean unity and solidarity among the Caribbean people as originally thought but rather the nationalistic and insular tendencies of Caribbean leaders. Over the past several years, since the times of independence, leaders have failed to acknowledge and/or reasonably consult the people on what they might think about an even stronger Alliance. Results from the survey indicate that an overwhelming majority of 65% feel a sense of connection to the culture and people of the other Caribbean nations. This is not surprising given that 93.6% believe that the island nations of the Caribbean do share a common history and therefore, a common way of life and traditions. The people of the Caribbean do in fact share more or less of the same history, culture, diet and belief, accounting for the unique influences that came from the different empires that ruled and number of living indigenous people. The fact that we do share a common history and roots should not be surprising. Slavery was a major part of most Caribbean island's history. During this time, as slaves would be auctioned off to various slave owners, families were often split apart (Brown, 2018). It is highly likely that the Caribbean people even share family lines across the islands. Each island is on average between 25 and 30 Nautical miles apart, yet seemingly so far apart in true connection, and regional coordination as already evidenced above (Yachting, 2010). The seemingly great distance that keep these countries apart does not really exist. What keeps the dream of regional prosperity so elusive is not the lack of connection among the Caribbean people but rather political rhetoric. It is the political and nationalist rhetoric that stands in the way between the dream of true, long lasting and powerful Caribbean coordination and prosperity. It is responsible for the alienation among the islands that in turn perpetuates the lack of overall Caribbean growth and development.

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Regional Integration

Perhaps the most interesting finding on this survey was just how much the ordinary citizens of the Caribbean considers themselves to be greatly connected with other Caribbean citizens even over the Caribbean Sea. What was equally as interesting was that though 76% of Caribbean nationals knew about CARICOM and nearly half thought it was somewhat beneficial, 81% called for an even greater degree of regional integration. This reinforces further what was earlier suspected; the insularity, disconnect and discord is not within the Caribbean citizens but within the Caribbean elites and political leaders. In fact, in 1958, during the time of the West Indies Federation, Wendell Bell's survey findings indicated that 51% of the Jamaican elites did not believe in the benefits of the federation while 41% did (Bell 2006). Albeit so among the elites, during the federation era especially, only Jamaicans abroad when they met other West Indians at school, in the community or other places, did they realize the numerous shared characteristics they possessed and the sense of community that was undoubtedly present (Bell, 2006). Age may also be a factor to consider when one speaks about change of any kind, Bell (2006) said,

Older elites are somewhat less likely to believe that Jamaica will gain by being part of federation than are the younger ones. This may represent a tendency of the younger elites to be generally more receptive to change and more favorable to modernization than the older ones, but data is insufficient to establish this explanation as a fact. (p.868)

Contrasting Bell's data to this current survey, this attitude maybe changing among the older crowds. 24% listed their ages as 42 and above on the survey. 83% of these individuals said that they would support a movement of even greater integration in the Caribbean and 17% said they might consider it. On the subject of CARICOM's effectiveness as it is, 42% of these individuals said CARICOM was somewhat effective while 20% said it was and 8% said it was not. It then becomes clear from this data that despite the present challenges and ineffectiveness of CARICOM, even those born as recently as 1978 and before, would still be open to the idea of deeper integration. It may be that more than anything that it is the connection they feel across their countries' borders; 67% indicated this fact and 96% already do consider some part of themselves as a Caribbean Citizen.

THE IMPERATIVE

How then does one even begin to bridge this divide? Even until now, the divide grows in this current regional- political climate. The answer is in what created it in the first place, Politics. Politics can divide people, but it is also the means by which people can gather under a banner for the support of a cause or movement. If the Caribbean people, who for the most part already have adopted a Caribbean identity would begin to realize the strong, natural and deep connection they already share since their conception, then true Caribbean unity would be a reality. The drawn up borders done by the European colonists does not have to be the final say. If one should remove the political rhetoric and the nationalistic ideals, they would find hundreds of years of common history and culture. Everything comes back to the seminal truth: “only an economically and politically integrated could maximize the sub region’s economic and political power and provide insulation against its provincial divisions”, (as cited in Will, 1991, p.10). It is understood that every nation wants to see the best outcome for itself, but if any of the Caribbean nations will have a fighting chance, it is imperative that they unite. St Vincent and Grenadines’ former Prime Minister James Mitchell (1987) said, “Independence has hardly protected us from what remains essentially the geography of the Caribbean. The rest of the world sees the Caribbean... as one region, and the Caribbean needs to greet the rest of the world with one voice if we are to exert any influence on the international forces controlling our destiny”, (as cited in Will, 1991, p.30).

The Threat of International Powers

On the subject of the mentioned “international forces controlling our destiny”. Mitchell (1987) maybe referring to the attempt by the United States in 1981 to divide CARICOM member states and subvert the Caribbean Development Bank (CDB). During this time, in an attempt by the US. Government to destabilize the Grenadian government (a CARICOM member state); the US put a condition on its financial grant to the CDB, specifying that the bank exclude Grenada from receiving educational loans. Grenada at this time had just undergone a communist revolution and had been under a communist government for the past two years. Regardless of any views that anyone may have towards the communist government, the audacity of the United States to undermine the CDB constitution was unbecoming. Tom Adams, a conservative Prime Minister of Barbados at the time and staunch enemy of the communist regime in Grenada, was reported to be so infuriated by the US’ actions that he rallied opposition to reject the grant under those conditions. Karl Hudson Phillips, leader of the conservative organization for the National Reconstruction in Trinidad and Tobago, shared the same sentiment: “Why would the United States attempt to destroy our regional institutions by forcing a violation of the CDB constitution”, (as cited in Will, 1991, p.24). As a result of such strong feelings, rather than division, there was a unanimous vote by the CDB to reject the grant. This was a great example of the strength gained from Caribbean unity

(Will, 1991). It may however, not be in the best interest of the more developed powers that this strong unity exists. Though Britain for the most part encourages Caribbean unity, there were some elements of the British government that opposed the “strong unity” as represented by a British Royal Commission in 1897. To this, Trinidadian Eric Williams (1970) said, “The West Indian Territories were divided and so Britain ruled easily”, after all, why would Britain want to give up the countries that funded its industrial revolution or supplement its workforce with skilled labor? (Will, 1991)

With now all things considered, past and present circumstances, it would appear that a decisive and strong political unification is the only hope the Caribbean region has if it is ever to see economic unity and progress as outlined by the CARICOM mandate. Whatever the process, and/or whatever political model it adopts, regionally developed or foreign, what is important are the elements that constitute it. There are models to consider such as the federalization of the Caribbean States fashioned after the US model or a political unification much like the European Union (EU). It should however be pointed out that CARICOM is already much like the EU; it only lacks the solidarity that is essential for success (Europe, 2019). Nevertheless, the merits and practicality of whichever political system that would be best applied to the Caribbean is beyond the scope of this paper. Nonetheless, this is also invariably true; and that is no matter the political system implemented, nothing will ever work without the consent, solidarity and resolve the people.

Addressing the Concerns

Understanding the bizarre nature of such a thought as a singular Caribbean State and understanding the hesitancy of many to such an unusual idea, data was also gathered by the survey representing people’s thoughts and views on the subject of a Singular Caribbean State. The numbers were close and were not at all predicted by the researcher. When asked if they would support the idea of forming a singular Caribbean State, 95 individuals chose to reply and 45% of them said “maybe”, 24% said “no” and 30% said “yes”. Upon asking the reasoning behind their answers, those in full support of it understood the benefits of a strong union, one saying, “It is an idea that should be explored. Such a unification would create opportunities for regional economic self-reliance and growth, trade, exchange of ideas, and technological advancement for Caribbean people.” Equally as interesting were all the responses against the idea or hesitant of it. All responses against the idea fundamentally cited the same issue, and it is that of a unique identity that they want to protect for their country. One person wrote, “Each Caribbean Island has certain aspects which make them unique. That is the beauty of it. A “unified” Caribbean would be forcing the islands to neglect some part of their culture, etc.”. even individuals that would consider this unification plan and knows of its benefits have their concerns: “It would bring greater unity. Economy would improve rapidly; inflation would be lower. I think though that some aspects of the culture should be preserved by each Caribbean Country.” These responses were predicted. These are

legitimate and understandable concerns; however, a unified political system would not jeopardize any of these mentioned things. As was already stated, the Caribbean islands share a great deal of history and culture. It is however true that since some events happened differently among the Caribbean islands and the geography, there would no doubt be differences. Nonetheless, even then, a federalist model would not jeopardize this. In the United States for example, States still have their own individual constitution and practices. Even under a unified Federal government, with the constant inflow of others from various states, the cultures and experiences of each state are still unique and distinct. New York is considered to have the best pizza, Florida is known for Disney world and New Mexico is said to be visited by Alien UFOs (Shone, 2019). In fact, citizens travel to these states all the times primarily sometimes to enjoy things only one can enjoy in those states, regardless of these various “flavors and cultures”, the United States is still only one country (Shone, 2019). It is a prime example of a unified country with a very diverse population. If people of so many backgrounds can live harmoniously in one space, then how much more a group of people who do share such similar backgrounds.

The Benefits from Unity

The federalization process, one much like the United States, would promote a singular entity working for the good of the whole. The regional state of the Caribbean would act as a singular whole in ensuring trade deals as a collective, regional security and ensuring overall progress for all. It would be a daring undertaking especially considering that the island nations have experienced much insularity. However, with a federal model, the supreme benefit is the collective strength the islands all have in each other. The Job market would increase, since the geographical area of the singular state would now encompass the entire region. Along with an increased market of opportunities is the ability to access them all as a regional citizen. The Intra- regional trading of both goods and services would also effectively go up. Additionally, a currency unification would do well to stabilize the economies and provide more profitable exchange rates and the formation of businesses (Stagman, 2019). More importantly, regional independence would be much more at reach than ever before. Bell (2016), said in his research, “...there is oil in Trinidad, bauxite in Jamaica...The West Indies federation is almost completely self-governing and looks forward to full dominion status in the near future...” and those resources are but a fraction of the large array of the collective natural resources possessed by Caribbean nations. If the Caribbean people ever hope to see a future of unprecedented prosperity and regional independence of foreign nations, then the people will have to see their connection to each other and learn to put differences. It is also up to the leaders to recognize this same “seminal truth” and do what is right by their people.

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Juno Beach by Rachael Hobbs

Lost Language by Kaili Sherman

The girl was selfish enough to think that

The wind blew for her,

The waves sailed for her,

The sun shadowed for her.

She was selfish enough to believe that

The ones lost along the way

Guided her,

Healed her,

Protected her.

Yet, though these selfish thoughts lead her,

As she looked at them in their most vulnerable,

She made no sense of them.

Almost as if the answer to life was being

Shouted in the town miles from her,

Whispered in the room adjacent to her,

Written on a postcard not mailed to her.

As she continued on,

She spoke no language of the trees or the bugs,

Conflicted in the sense that answers rested in plain sight;

With no dialect to interpret them.

Stardust (A Rondeau) by Jen Beebe

We are brimming cups of dust.

From darkness, cold as nothing to matter's violent, burning thrust.

That singularity grew our smiles, our guiles, our wistful dreams;

Speeding through heaven's halls; burning angels masked as starry beams.

Inflating, pervading, the fire-child of nature's primal bust.

But fusion devours greedily; yes, in Gravity We Trust!

Forged in stars our gold and old, our priests and beasts, our just and lust.

And back to earth we'll fall at last, carbon pays our sin it seems:

We are brimming cups of dust.

Hail Mary full of Grace, thank you for our lucky place; a must,

To sit so perfect-like; iron core at war to save the crust.

One day our furnace loses the fight; our gas no longer gleams.

And so our scorching goodbye will feed the fount of other streams.

Perhaps we'll meet again, if recycled rosaries combust.

Our souls seed the universe, yes - we are brimming cups of dust.

Glory of the Gospel by Jen Beebe

Espresso is not a cure for depression, but sometimes I take a double-shot, hoping it will get me up and moving.

I found God today. Cost me \$190.00 at Total Wine and Liquor. The bottle is empty now, but I am keeping the blue label in my nightstand.

I am still feeling the glory of the gospel at dinner time. I make grilled cheese. Tom wants a steak, but I tell him we are not rich. I cut my finger opening a can of vegetables. A spot of my blood cooks together with the corn in the microwave. I stare through the muddled window as it turns around and around.

The microwave keeps shutting off in mid-cook, and Tom tells me enough already, buy a new one. It's fifteen years old and doesn't match the other appliances.

GPS girl tells me Brandsmart is a twelve-minute drive. My mother is always telling me about their sales. In eleven minutes and eight seconds, I see the store, glaring and patriotic. The paint, loud and lewd, makes one consider communism.

Microwaves are not that pricey, but I put it on my credit card because I am saving up for a trip to the Maldives.

The kids are cranky the next morning; they left the puzzles all over the living room floor. I trip over an empty box and tell them they better clean. They fight over candy from Halloween, which was five months ago. No one listens when I tell them, "Brush your teeth, put on your shoes."

I give them both a lollipop, push the pieces of the puzzle aside; it's 7:46 am and the bus will take it all away soon.

When everyone leaves, I sit at the computer and delete work emails. After, I drive to the gym. I park in a spot, and since I am late, I watch the women run. They workout devoutly, this lot, worship the bar, yet their thighs are dimpled skin, jiggling in tune with their yapping jaws. I smile when one looks up at me and drive back home.

At home, I get properly dressed and head out to lunch. Near the beach sits a popular sandwich shop. At noon it's thronged with locals and their lattes. This time I exit my car, walk past the soccer moms, the work-from-home moms, the yoga moms. Next door is the Four Seasons. I walk through the lobby, out past the towel check, past the pool. I sidle into a spot, ocean side, imposter tourist. The waiter asks me if I want the usual.

I order the swordfish because I'm bored. He is young and looks like the beach: sandy hair, briny-green eyes, teeth straight and white against his tan. He flashes his boyish grin, "Something different, today?" But I don't answer, and he doesn't expect an answer, just smiles and looks friendly and decent. Waiters are great actors.

Lunch and the boy arrive. When he walks away, I look at the azure blue of the ocean, take half the fish and toss it over the railing. Seafood is disgusting, I never eat it.

Later in my living room, I pick up the jumbled puzzle mess, sorting all the different pieces, for all the different boxes. I'll tell Tom how good the kids are, cleaning their messes.

But the mess is never really clean, and the Glory of God deserves diligent service. I grab my keys and think: to hell with the gym girls, I'll worship my kind of bar.

Only I never get the chance because next to the liquor store, in the Home Depot parking lot, I spot a huge fiddle leaf fig tree prominently displayed outside the garden section. It will be a perfect replacement for the dead one, sitting bare-branched beside the sliding glass door in the family room.

Sure, Tom will complain because it's my fourth one. They don't actually live inside, these fig trees; they only actually live on Instagram. But I feel a short burst of happy at the thought of bringing it home. I take a selfie in front of my new tree, lunch makeup and fig leaves, shiny, dewy, camera snapping in great and furious succession until I get the one with the pretty side of my face.

The tree fits in my Town and Country, but I drive too fast and the pot tips on its side. Spilling out mulch and dirt, little styrofoam balls of fertilizer combining with stale french fries and discarded Pokémon cards, together ugly on the van's leased floor.

To view this great felling takes only a moment, but I never see the tow truck slam into my side. In that first brief breath of a millisecond, I think: I am one with the fiddle leaf fig, my insides spilling, beautiful only on Facebook, dry and withered by the window, always dying.

The millisecond ticks over into the next order of magnitude, and now I am awake, the universe a blinding, shiny hue - sharp, vivid. Daughter's seven-year-old face, breathy laugh, skateboards, holding hands; she likes her friends to see I can ride with her. One day she will grow and that will embarrass her. My son, hockey pads too big, the coach tells him to be aggressive, later, pajamas too small, says he doesn't want to check, doesn't want to hurt anyone. Tom yells at the TV on Sundays, never yells at the kids; laughs at me, rolling his eyes, because I dance with the broom.

Middle-age is a mire of conundrums, a trap of the routines of mundanity. A chase of fleeting moments, objects of joy, materials to fulfill; we consume in frantic bouts, hoping to slake a creeping empty.

In childhood, we breathed life in greedy gulps; it was never the new bike; it was the very action of riding it.

Those big things I wanted to do so long ago, big things I wanted to be, they are faded tracing paper, pale, silhouettes; I can't seem to color in their forms. I see only the Barbie sticker, slightly crooked, slightly peeled, inside the pantry door; my little boy's laugh, easy, contagious, he laughs at everything we joke; I keep forgetting to bring my mom's cheesecake pan back, that thing is thirty years old; the smell of wet grass, Tom must be mowing the lawn.

The mess is gorgeous, I think, it's the glory of the gospel, no espresso to start the engine or scotch to keep it running. Tonight, we will skip the baths and play Uno. I'll make their favorite chicken soup, the one I said it was too hot for last week.

Sabiduría Staff

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