AP® SEMINAR
2015 SCORING GUIDELINES

AP SEMINAR PERFORMANCE TASK RUBRIC: TEAM PROJECT AND PRESENTATION
COMPONENT 2 OF 3: WRITTEN TEAM REPORT

CONTENT AREA	PERFORMANCE LEVELS		
1 Understanding and Analyzing Context	The report poses a problem, question, or issue simplistically, places the problem in a limited context, and provides no rationale, or a weak rationale, for the inquiry process. 2	The report poses a problem, question, or issue with reasonable complexity, places it in a clear context, and provides a rationale for the inquiry process. 4	The report poses a well-defined problem, question, or issue with a high degree of complexity, places it in a clear and relevant context, and provides a compelling rationale for the inquiry process. 6
2 Understanding and Analyzing Perspective	The report identifies weak or irrelevant perspectives and refers to arguments without evaluating their validity. 2	The report identifies relevant perspectives, provides limited evaluation of the validity of arguments and reflects a limited understanding of how the reasoning is logically aligned with the conclusions of those arguments. 4	The report identifies and clarifies relevant perspectives, critically evaluates the validity of arguments, and conveys a clear understanding of how the reasoning is logically aligned with the conclusions of those arguments. 6
3 Selecting and Using Evidence	The report cites limited evidence to build its argument. 2	The report cites relevant evidence to build its argument. 4	The report effectively synthesizes evidence from multiple perspectives to build its argument. 6
4 Building and Communicating an Argument	The report offers opinions or unclear resolutions, solutions, or conclusions not supported by evidence. 2	The report draws weak connections between the evidence and one or more resolutions, conclusions, and/or solutions. 4	The report offers one or more well-reasoned resolutions, solutions, or conclusions that acknowledge consequences or implications. 6
5 Selecting and Using Evidence	The response includes many errors in attribution and citation. The bibliography, if included, is inconsistent in style and format and/or incomplete in citation elements. 1	The response attributes and cites sources used with a reasonable amount of accuracy and thoroughness. The bibliography includes nearly all referenced sources, most of which are consistent and complete in citation elements. 2	The response appears to accurately attribute and cite the sources used. The bibliography includes all referenced sources, and is consistent and complete in citation elements. 3
6 Grammar and Style	The report contains many flaws in grammar and style that interfere with communication to the reader. 1	The report contains some flaws in grammar and style that minimally interfere with communication to the reader. 2	The report contains few flaws in grammar and style and clearly communicates to the reader. 3

AP® SEMINAR
2015 SCORING GUIDELINES

ADDITIONAL SCORES: In addition to the scores represented on the rubrics, readers can also assign scores of **0** (zero) and **NR** (No Response).

0 (Zero)

- A score of **0** is assigned to a single row of the rubric when the response displays a below-minimum level of quality as identified in that row of the rubric.
- Scores of **0** are assigned to all rows of the rubric when the response is off-topic; a repetition of a prompt; entirely crossed-out; a drawing or other markings; or a response in a language other than English.

NR (No Response)

A score of **NR** is assigned to responses that are blank.

Embryonic Stem Cells: The Future of Medical Innovation

AP Capstone Seminar

24 January 2015

Embryonic Stem Cells: The Future of Medical Innovation

The struggle between science and ethics has been prevalent throughout all of time. The debate behind embryonic stem cells (ESCs) is an example of a topic that walks this controversial line. In order to navigate this complex web of information so that an opinion may be formed on the morality behind the research of ESCs, the science, ethics, and politics of ESCs must be considered. Fundamentally, ESCs are human cells derived from an embryo. Once harvested, these cells can be manipulated to behave as any other cell in the human body. This ability introduces a world of possibility to how we treat diseases such as Parkinson's, Multiple Sclerosis, and ALS. However, with these potential benefits comes controversy. Some people believe the removal of this inner mass of cells is similar to taking away a life. Others find the medical benefits of these cells too great for ethical issues such as this to deter more research in the field. The debate stems from the decision on whether to place an embryo's potential human life above the well-being of fully developed human. Furthermore, throughout the years, the policy in the United States that has involved stem cells has wavered between support and rejection and must be considered. Liberal presidents who have been in office while ESCs have been a concern have passed legislation in support of research on ESCs, while President George W. Bush, a conservative, banned its federal funding. The changes in government opinion have made it hard for big headway to be made in the field and highlights the controversy behind the debate. Therefore, evidence compiled from the scientific, political, and ethical lenses has made it evident that the benefits of ESC research outweigh the ethical controversies associated with it, and further actions by the United States government must be taken.

Primarily, the potential benefits of ESC research appear to be limitless. The most promising benefit of ESC research appears to be the potential ability to cure diseases that

currently have no alleviation. For example, with regards to treatment of Parkinson's disease, ESCs can be manipulated to differentiate into neurons and then be transplanted into a patient's brain. The patient's dying brain cells are replaced with newly specialized ESCs. A leading stem cell biology researcher, Lorenz Studer, has seen success with "making highly efficient dopamine-producing neurons from human embryonic stem cells and have transplanted them into the brains of rats and mice with a dopamine lesion" (Robson, p.1, 2014). In other words, Studer was able to successfully replace cells in the mice's brains that were not working due to Parkinson's disease with specialized ESCs. This advancement is the first step in treating diseases like Parkinson's. Not only could ESCs be used to treat diseases where cell degeneration occurs, but they could also help with the research and understanding of such diseases. Many life threatening ailments, such as cancer, are due to abnormal cell division, and problems caused by these ailments can be solved with ESCs. Once obtained, ESCs are allowed to divide and spread in a petri dish for many months. Researchers can study ESC's development and potentially learn how and why defects occur in cancer cells ("Potential Applications," 2009). This knowledge may lead toward new cures and treatments. Finally, ESCs could potentially grow entirely new organs. Patients on transplant lists, awaiting a new organ, could receive the lifesaving organ they so desperately need without anyone having to die in order for them to receive it. According to U.S. Government Information on Organ and Tissue Donation and Transplantation, "18 people will die each day waiting for an organ" (2014). With the help of ESC research this atrocious statistic can be eliminated. These benefits only touch the surface of what ESCs could potentially do for suffering patients.

Furthermore, one of the main arguments made by the people who are against ESCs is that the embryos have a right to life, but this argument calls into question the right to life of those

who could benefit from the developments from ESCs. Russell T. Daley, California graduate, stated to the Institute for Applied and Professional Ethics of Ohio University, "that no right is absolute and that the right to life can be overridden with sufficient justification" (Daley, p.1, 2001). Sufficient justification for the research on embryonic stem cells comes from the fact that the right to life of many more people can be preserved with the small sacrifice of a few embryonic stem cells. The example of the effects of Alzheimer's attests to Daley's claim. According to the US Department of Health and Human Services (2015), "5 million Americans ages 65 and older may have Alzheimer's disease" (p. 1). The same service (2015) states "Alzheimer's disease is an irreversible, progressive brain disease that slowly destroys memory and thinking skills, and eventually even the ability to carry out the simplest tasks" (p.1). This disease breaks down the patient to a state of being almost obsolete. However, recent research on ESCs have shown potential to provide a cure to the disease. With further research on ESCs, almost 5 million Americans could be saved from this state of degradation. So, if such a large multitude of people with diseases like Alzheimer's can benefit from research on ESCs, the potential of an embryo to form a human should not prevent this step forward in the medical community.

Despite the vast potential of ESCs, some people are still caught up in what they believe to be the method in which ESCs are derived. Embryonic stem cells are cultivated from the embryo at a very early stage of life. At this point, the cells are undifferentiated. As the embryo continues to form, cells differentiate into different types like liver cells, heart cells, or brain cells. If the cells of an embryo are cultivated before they hit this stage then they can be manipulated to behave like any differentiated cell one may choose. ("Stem Cell Basics," 2010) The ability to manipulate ESCs is the source of its potential. It is also a critical factor to consider, being that it

introduces the idea that the cells are undecided as to what they will specifically become. As stated by Lee Silver, a professor at Princeton University in the Department of Molecular Biology, in an interview with PBS, these cells are "Not a fetus, not a child, just a mass of tissue" (Silver, p.1, 2001). A human life has not been destroyed, as many would argue, because a human life has not been created yet. ESC research simply redirects the path the cultivated cells will take. Further, this undifferentiated state explains that the embryo itself is not a person yet and therefore does not have the moral status of a person. Russell Blackford, a noted writer and philosopher, in reference to embryonic stem cells, argues, "The predicament of an embryo that has been created for stem cell research may be contrasted with that of an adult human being who has been diagnosed with cancer, and fears the rapid approach of death. A prognosis of imminent death from cancer is tragic. A proposal to discard an early embryo is nothing of the sort." (Blackford, p.1, 2006). Blackford's theory is built on the fact that because embryos in a pre-differentiated stage have no nervous system and therefore no senses, their needs should not be placed above those of dying cancer patients who fully experience their pain and suffering. If ESCs do not have senses then they can not, in actuality, have the same moral status of a cancer patient. The same principle is applied to scenarios such as taking organs from brain dead patients. These patients have no senses or awareness therefore their needs are placed below those of suffering patients on organ donor lists. This logic makes it ethically sound for brain dead patient's organs to be extracted and donated. This logic also validates redirecting the potential life of ESCs in order to assist the lives of other patients.

Yet another commonly misunderstood aspect of ESCs is the method in which they are cultivated. Many assume the cells are taken directly from the womb of a human female. This is not the case. ESCs are often extra cells donated from *in vitro* fertilization clinics such as Shady

Grove Fertility's (SGF) Fair Oaks, Virginia office. *In vitro* fertilization, a process in which an embryo is produced outside of the womb, is mainly used by women who are infertile and cannot not become pregnant themselves. In other words, these cells have been conceived outside of the womb by a scientist injecting a sperm into an egg in a laboratory ("What are Induced" 2010). Often times there are embryos leftover that the patients do not wish to use. Trusted Reproductive Endocrinologist, Dr. Paulette Browne, from Shady Grove says, "SGF patients that have unused embryos are welcome to donate them if they no longer would like to store them and do not want to discard the embryos." ("CNN Reports," p.1, 2013). Also, using these extra cells from the clinics gives them a purpose when they otherwise would be thrown away. So by using these cells for research, the "life" of them has actually been saved. It is in this way that the ethical controversy can be looked at from a different point of view and be portrayed in a less harsh light.

In addition, the United States of America was a nation built upon democratic principles. In other words, the government functions mainly to fulfill the wishes of the majority of citizens in the nation. The government's policy in response to embryonic stem cell research should be no different. According to a graph compiled by Gallup (2014), a polling company whose data used in many trusted government analyses, that includes data from polls conducted since 2003, the majority of US citizens have believed that research on stem cells derived from human embryos is morally acceptable (p.1). In 2014, 65% of those who took the poll believed research on ESCs was morally acceptable, while 27% believed such research was morally wrong (p.1). These statistics show that the majority of Americans believe embryonic stem cell research is morally acceptable. Not only do Americans believe ESC research is morally acceptable, but also statistics have also shown that a majority of Americans believe the government should

support embryonic stem cell research. As recorded in the White House National Archives (2001), in August 2001, President George W. Bush announced that federal funding for research on embryonic stem cells would be halted. The federal government would only fund research on the twelve stem cell lines that had already been created (p.1). However, in the same month that same year, a Gallup poll (2001) revealed that 55% of subjects in the poll believed research on embryonic stem cells derived from extra fertilized eggs from *in vitro* fertilization should be funded by the federal government (p.1). Another Gallup poll (2009) showed that a majority of Americans believed the government should ease restrictions placed on ESC research at that time (p.1). The statistics derived from the nationally acclaimed Gallup polls show that not only do Americans believe embryonic stem cell research is morally tolerable, but also that the US government should fund research on such cells.

Embryonic stem cell research is also largely a religious argument. Christian advocates tend to argue that ESCs are disrespectful to their faith due to this religion's support of the value for life. On the other hand, Kim Lawton, reporter and editor for the PBS show "Religion and Ethics Newsweekly," argued that this argument could also be in support for ESCs. Lawton contended that the Bible pushes the principle that a, "Good Samaritan tries to go out of his way to alleviate suffering" (Abernethy, p.1, 2001). The cluster of embryonic stem cells is not capable of feeling any pain. However, patients suffering from a disease that could be treated by ESCs do. Utilizing ESCs would alleviate the suffering that the Bible refers to. Lawton's logic undermines the arguments presented by Christian advocates by pointing out the contradicting beliefs they hold. Additionally, some religious institutions even support the research of ESCs. For example, the Religious Action Center of Reform Judaism says, "what would be immoral and unethical is cutting off funds for promising medical research" (Abernethy, p.1,

2001). Although this organization is devoutly religious, it's basic belief is that the importance of ESC research should be placed above any possible ethical concerns. Even though some religious groups claim to be against ESC research, many of their fundamental principles actually support the research.

Despite the promise of ESC research, a new innovation in the field of science has called into question its necessity. Induced Pluripotent Stem Cells (iPS cells) are adult stem cells that have been genetically manipulated to behave as ESCs. Some argue that iPS cells are better than ESCs, because they do not pose the ethical debate that ESC research does. No embryo is harmed in the harvesting of adult stem cells. While this may be true, iPS cell research is still in the beginning stages. At this time it is not clear which path will lead to future success. While ESCs and iPS cells both appear to be undifferentiated in form, researchers do not know which cell type will be more successful in actual application ("What are Induced," 2009). Also, the iPS cell research poses threats of its own. Researcher Insoo Hyun, an Associate Professor of Bioethics at Case Western Reserve University, in his published scientific paper elaborates on the risky aspect of iPS cell research, "Safety is also a major concern for human iPS cells since the retroviruses used to insert the pluripotency-inducing genes might themselves lead to cancer and other harmful mutations. In contrast, human embryonic stem cells are the only pluripotent human cells that are genetically unmodified; they are pluripotent stem cells in their purest, unadulterated form. Thus, in addition to possessing enormous scientific value in their own right, embryonic stem cells will be needed to serve as controls for examining the safety and efficacy of human iPS cells"(Hyun, p1, 2008). The dangerous side effects genetic manipulation of adult stem cells may cause is another reason why both avenues of stem cell research must be studied.

Most of the evidence supports ESC research, and therefore, the next step necessary is to set in place policy on the topic. US policy over the year has fluctuated, making advancement difficult. In 1998, scientist James Thomson and his colleagues at the University of Wisconsin derived the first human embryonic stem cells ("James Thomson Biography – Academy of Achievement," 2013, p. 1). President Clinton was in office at that time, and suddenly he was faced with the need to set into place policy outlining what could and could not be done in the realm of embryonic stem cells. Before Clinton, no federal funds were allocated toward stem cell research, only private funds were. In January 1999, with request from the National Institutes of Health, the liberal Clinton Administration decided to allocate funds for research just on stem cells derived from spare embryos from fertility clinics (Dunn, 2005, p. 1). However, after Clinton, President George W. Bush, a conservative, took office. He did not believe embryonic stem cell research should be supported, so in 2001 he cut off funding for all embryonic stem cell research except for research being conducted on the stem cell lines that already existed (Dunn, 2005, p. 1). Further, in 2007, President Bush passed Executive Order 13435, which supplemented the 2001 announcement. These actions limited research severely, considering there were only 19 existing stem cell lines, many of which were contaminated. Then, in 2008, President Barack Obama took office, and once again the government had a liberal president. The following year, Obama passed Executive Order 13505 (2009), which completely revoked the 2001 Presidential Announcement and 2007 Executive Order. This order stated that the government would now supply grant money to embryonic stem cell research of all kinds (p. 1). Obama's order continues as the current national ESC policy.

With the fluctuations in US policy, it becomes necessary for one specific rule to be put into place so optimal research can be done. Therefore, we recommend that the US federal

government continue investing in embryonic stem cell research. The advancements that could be made through such research could potentially save many more lives than what would be lost through obtaining the stem cells. However, the opinions of those people against stem cell research cannot be disregarded. In order to satisfy anti-ESC activists, the government should not fund projects to create new stem cell lines from embryos created specifically for the purpose of deriving embryonic stem cells. The extent of government funding for embryonic stem cells should just be limited to creating and research on cell lines from embryos left over from in vitro fertilization and research on already existing stem cell lines. Government support is needed to make sufficient advancement on the research and application of ESCs within medicine. If this resolution is not enforced, the scientific and medical field would be greatly hindered in its ability to gain knowledge. Also, treatments that could potentially become a reality in a matter of years will take decades, leaving thousands of lives lost that could have otherwise been saved. With the scientific and ethical evidence made clear and the political history analyzed, federal government support for research on embryonic stem cells from fertility clinics becomes the most logically sound policy.

In conclusion, evidence collected from the scientific, ethical, and political lenses favors the potential benefits of ESC research above the ethical concerns. Research on ESC could broaden the understanding of diseases and lead to new treatments and cures. The ESCs that are used to conduct such research are at a very early stage of development. The cells are undifferentiated and therefore have no specific function. Moreover, these unique cells are donated by fertility clinics, not taken from a mother's womb as many falsely think. In this way, the method of derivation does not call into question one's ethics. Lastly, the fundamentals of the US was based on the need to serve the majority of people, and the majority of people believe

research on embryonic stem cells is ethical. So, it can be concluded that the potential benefits of ESC research outweigh the ethical controversies. Past efforts by the US government to enforce a policy on ESC have failed. That is the reason why the federal government of the United States must fund ESC research on stem cells obtained from embryos donated from fertility clinics to better the lives of our posterity.

Word Count: 3,100

References

Abernethy, B. (27 July 2001). Religious Views on Stem Cell Research. *PBS*. Retrieved December 14, 2014, from http://www.pbs.org/wnet/religionandethics/2001/07/27/july-27-2001-religious-views-on-stem-cell-research/15307/

Alzheimer's Disease Fact Sheet. (22 January 2015). *US Department of Health and Human Services*. Retrieved from http://www.nia.nih.gov/alzheimers/publication/alzheimers-disease-fact-sheet.

CNN Reports on Embryo Adoption: Video. (2013, August 16). Retrieved December 14, 2014, from http://blog.shadygrovefertility.com/2013/08/16/cnn-embryo-adoption-video/

Daley, R. (28 April 2001). The Ethics of Embryonic Stem Cell Research: Finding Common Ground. Retrieved January 20, 2015, from http://www.ohio.edu/ethics/2001-conferences/the-ethics-of-embryonic-stem-cell-research-finding-common-ground/

Dunn, K. (4 April 2005). The Politics of Stem Cells. *NOVA*. Retrieved from http://www.pbs.org/wgbh/nova/body/stem-cells-politics.html.

Gallup Poll: "Stem Cell Research." (2014). *Gallup*. Retrieved from http://www.gallup.com/poll/21676/stem-cell-research.aspx.

Hug, K. (23 March 2011). Embryonic stem cell research: An ethical dilemma. *Eurostemcell*. Retrieved December 12, 2014, from http://www.eurostemcell.org/factsheet/embyronic-stem-cell-research-ethical-dilemma

Hyun, I. (2008, January 1). Stem Cells from Skin Cells: The Ethical Questions. *Questia*. Retrieved January 22, 2015, from https://www.questia.com/library/journal/1G1-187426915/stem-cells-from-skin-cells-the-ethical-questions

James Thomson Biography. (11 November 2013). *Academy of Achievement*. Retrieved from http://www.achievement.org/autodoc/page/tho1bio-1.

Removing Barriers to Responsible Scientific Research Involving Human Stem Cells. (11 March 2009). *GPO*. Retrieved from http://www.gpo.gov/fdsys/pkg/FR-2009-03-11/pdf/E9-5441.pdf.

Robson, L. (2014, December 12). Parkinson's disease: How could stem cells help? *EuroStemCells.* Retrieved January 19, 2015, from http://www.eurostemcell.org/factsheet/parkinson’s-disease-how-could-stem-cells-help

Russell, B. (2006, March 1). Stem cell research on other worlds, or why embryos do not have a right to life. *NCBI.* Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2564478/.

Silver, L. (2001, October 1). On Human Cloning. *PBS*. Retrieved January 18, 2015, from http://www.pbs.org/wgbh/nova/baby/cloning.htm

Stem Cell Basics. (2010, September 13). *National Institutes of Health*. Retrieved January 13, 2015, from http://stemcells.nih.gov/info/basics/pages/basics3.aspx

What are Induced Pluripotent Stem Cells. (2009, March 30). *National Institutes of Health*. Retrieved January 23, 2015, from http://stemcells.nih.gov/info/basics/pages/basics10.aspx

What are the potential applications of stem cell research? (2009, June 1). *EuroStemCells*. Retrieved January 20, 2015, from http://www.eurostemcell.org/faq/what-are-potential-applications-stem-cell-research

Why Organ, Eye, and Tissue Donation? (n.d.). *organdonor.gov*. Retrieved January 23, 2015, from http://www.organdonor.gov/index.html

[Names redacted]

[Name redacted

AP Capstone Seminar

17 February 2015

An Analysis of China's One-Child Policy

With nearly 1.5 billion people, China has maintained the world's largest population for over a century. However, rapid population growth has caused much concern in the past 50 years. This issue was met with the one-child policy, a controversial legislation placing limits on how many children each family may have. Despite some success in hedging population growth, the policy has not only made lasting impacts on Chinese culture and society due to its unethical and coercive nature, but has also heavily skewed population composition. The policy's inherent basis in communism has also created an economically focused "one-child bureaucracy" within the government. For these reasons, we believe that extensive reforms are necessary to prevent further human rights violations and mitigate future demographic imbalance.

We chose to explore this topic primarily due to the many accounts of modern human rights violations in China. Recent media attention has educated the United States on the scope of control that the policy has over the Chinese people. One of the most powerful examples is the viral photo of Feng Jianmei being forced to abort her 7-month fetus (Beech). The photo, showing Feng laying next to the fetus in a hospital bed, outraged the American public. We concluded that it would be of both national and international relevance to investigate the true degree to which the rights of China's people are repressed by this policy, and to use this information to propose reasonable solutions to counter and possibly end such repressions.

Historical Background:

In 1949, after nearly a decade of civil war and unrest, Mao Zedong's communist party was able to overthrow the Chinese government, replacing it with their own. During the newfound peace, the country's population skyrocketed; the population growth rate reached 2%, nearly double the world average at the time (Drucker). However, extensive population growth combined with a reduction in food production resulted in a massive famine and significant social unrest (Fitzpatrick). This trend continued until 1978, when the next leader, Deng Xiaoping, took control. Unlike his predecessor, Deng recognized the complications that would arise if this expansion did not slow. When population projections for 2000 came in at 1.2 billion, Deng decided to hold a birth-planning conference, ultimately leading to the creation of the one-child policy in 1979.

Political:

However, population growth was not the only reason for the one-child policy's implementation; the uniformity and widespread application of the policy also served to increase the amount of control the communist regime held on China's population. According to Bing Jia, affiliate of the Global Legal Research Center at the Library of Congress, cybernetic researcher Song Jian's findings demonstrated that food and water shortages were inevitable if the population did not decrease (Jia). Eventually, Jian's analyses encouraged government intervention. Following the social unrest during Mao's reign, communist leaders saw the potential threat to the stable, one-party government that a famine could create, leading them to enact stringent laws to reduce the population.

The communist political environment has also distinctly affected the execution of the one-child policy. Communism's structure in China dictates that most laws should be

implemented on a territorial, rather than national, level. These territories have the autonomy to make minor changes to the policy based on the conditions of their demographic. For example, rural families in the Guangzhou territory are not penalized for having extra children, while urban families are required to pay the massive social support fee (Hays). Despite claims by the *Washington Post* that such actions "endorse regional differentiation and double standards", Vice Minister of the Family Planning Commission (FPC) Zhao Bingli holds that by accommodating for these differences, the policy more effectively supports society in all territories (Bingli). By allowing for individuals territories and government officials of the commission to determine the implementation of the policy, the government can maintain greater control of all of the Chinese people.

The desire to preserve authority over the population through the one-child policy necessitates a large workforce of 300,000 employees and 80 million volunteers under the Family Planning Commission, the organization responsible for the policy's success. To ensure strict implementation, employee salaries are dependent on a quota system (Hays). Their job is to limit the number of children born in their district. This leads to significant pressure placed on women to undergo sterilization procedures and postpone marriage to prevent pregnancy. Yet, because quotas are often unreasonable, employees often have their salaries reduced and become corrupted collecting social support fees paid by families with extra children. In 2013, lawyer Wu Youshui found that the Chinese provinces collected over 3.1 billion dollars in fees, but very little actually went to the education of the extra children. Instead, Youshui found that "the majority of those fees went into the local authorities pockets" (Guilford). Corrupted government officials, easily swayed by the prospect of money, are a likely reason for the continuation of the policy despite predictions of future negative effects on the country's economy and society.

Economic:

These corrupted government officials only present the "tip of a problematic iceberg," according to Joan Kaufman, Distinguished Scientist and Senior Lecturer at the Heller School for Social Policy and Management at Brandeis University. Violators of the policy generate millions of yuan each year for local governments, and it is this, she argues, that has created the "one-child planning bureaucracy" that is evident in cities and towns throughout the nation (Page). This bureaucracy is focused primarily on profiting the government, leading officials to ignore the predicted more severe economic consequences.

By 2050, United Nations data predicts that 23.9% of Chinese people will be over the age of 65. Chinese economist Shuang Ding states that "China has reached a turning point where the demographic dividend will become a liability." He supports this claim by citing that while the fertility rate has dropped from 1975's 3.0 to a manageable 1.6, it is currently experiencing a large decline in the replenishment of the country's younger population. Thus, the ratio of working age population to the dependent population, the dependency ratio, is rapidly declining (Holliday). As a result, problems with elderly support will arise.

In accordance to Chinese culture, after retirement most elderly live with and are taken care of by their children (World Trade Press). Therefore, single children are often burdened with large amounts of responsibility. This situation is common and stems from the stress that Confucianism, the leading social and philosophical system in China, places on filiality. According to Christian Jochim, professor of Comparative Religious Studies at San Jose State University, filiality is the strict obedience and reverence for one's elders and ancestors. The parent-child relationship is the first of Confucianism's five relations established to restore order to society. Children are expected to repay their parents and ancestors for the gift of life with

reverence. Through this, one's natural order in life is realized (Jochim). However, as American analyst Zachary Zimmer points out, a problem arises from this tradition. In 1998, there were more than six working age adults to each elderly person. However, by 2040 there will only be two for each (Zimmer). This will make it very difficult for anyone over the age of 60 who isn't working to be provided for, giving rise to the "4-2-1 problem," wherein four grandparents and two parents are taken care of by only one child (China's 'One Child Family' Policy). In rural areas, these issues are further exploited. Peasants with limited savings and no pensions require the support of the children they can no longer afford to have. In the past, the children worked on the farms and later provided for their parents upon their retirement (Kane). Now, the aging population will be forced to work to an older age in much harder conditions in order to survive.

Scientific:

While the increasing age of the demographic will affect society at large, individual children are also adversely affected by the choices that potential parents have to make because of the one-child policy. According to an article from the Canadian Broadcasting Corporation, married couples "both have two sets of parents who are getting older and will need to be taken care of in the future," requiring increased time and resources dedicated to elders (Germain). For this reason, many couples in China are waiting much longer before having a child.

The decision to delay conception has caused an increased susceptibility to genetic defects at birth. Several studies have shown that children with mothers over the age of 40 are much more likely to suffer from Down syndrome. Other findings indicate this same pattern to be apparent on a larger scale, applying to a multitude of conditions. Doctors from the Department of Psychological and Brain Sciences at Indiana University, as well as experts from Sweden, suggest that advancing paternal age creates a higher risk for mental deficiencies. Children born to fathers

over the age of 45 have an extremely high prevalence rate of autism, ADHD, and bipolar disorder (D'Onofrio et al). These conditions often place new, multifaceted stresses on individual children and families that are partially avoidable. If young adults were free of the financial stresses of caring for parents and grandparents, they would have greater ability to care for children at a younger age.

Cultural:

Most of China's social norms and guiding moral codes were put in place by Confucianism, an ethical, social and philosophical system that first arrived in China in the sixth century. Its influence can be seen in the way that the Chinese view the structure of family and society (Jochim). Confucianism did not place any emphasis on the composition of the family, and neither does Buddhism, the largest organized religion in China. Buddhism does not regard marriage and childbirth as sacred obligations, but the concept of rebirth implies that family formation and reproductive behavior are of some import (Simons). Vast differences in family composition throughout provinces in China suggest that religious and philosophical traditions had little influence on the one. Both Buddhism and Confucianism did however, establish many of the traditions that prioritized males over females.

In Chinese culture, male children have long been preferred over females. This directly results from the dominant patrilineal family system, in which the majority of a family's assets are left to a male heir. This served to ensure the preservation of the family name, protecting the parents' legacy. Thus, having many sons was considered good luck, as well as a measure of security. This influence goes as far as naming: Lai Di, a common name for girls, translates to "son follows quickly," demonstrating the desire for male offspring (World Trade Press). This tradition of patriarchy promotes virilocal marriages, wherein newly married couples are

pressured to live in proximity to the husband's family. According to a report authored by Marcus W. Feldman, the director of the Morrison Institute for Population and Resource Studies at Stanford University, after marriage the wife would leave her family for her husbands' and have no legal rights or obligations towards her birth family. As a result, boys became precious because they would not leave home, but work in the family business, earn the wages, and take care of the parents after they got old. A son would also provide a daughter-in-law to help with additional housework as well as a dowry that supplied economic benefits (Jin). In effect, these traditions make having a female child a strain upon a family, therefore making it more socially and financially beneficial to have a boy. Coupled with the rules of the one-child policy, this poses a threat Chinese society and economy.

Although the government tends to ignore these effects, the people of China have expressed great concern over the influences family-planning laws have had on their population. While most countries do have slightly more males than females, usually around 105 males per 100 females, China's cultural preference of male children has caused a much larger disparity. Due to societal traditions, there has been a massive increase in abandoned, aborted, and orphaned females ("China's Demographic Crisis"). These practices made the country's gender ratio reach 1.14 males per female in 1993. As ultrasound technology has become more available and accurate, selective abortions of female fetuses have only increased this divide; as of 2010, nearly 20% more male children are born each year, one of the largest disparities in the world (Franken). A group from the Ohio Research Center specializing in population studies estimates that in the next 20 to 30 years, over one-fifth of China's male population will have no spouse at age 40. In Chinese society, where marriage is viewed as all but universal, being without a spouse can be detrimental to one's social standing and acceptance. There is also a large amount

of evidence that suggests that unmarried men can increase the crime rate - strong social ties and familial commitments generally inhibit impulsive and violent behavior. A group of population experts from the Ohio Research Center believe that, if such a large portion of the country's population became alienated, there would be "vast destabilizing consequences" for all of society (Drucker).

Solutions:

After extensive debate under the National People's Congress in 2013, China took certain steps to reduce the stringency of the policy, expanding the number of people allowed to have more than one child. Studies demonstrated that one quarter of China's population would have been over sixty-five by 2050 if the same policy continued, creating a smaller workforce and greater dependence on the young people of the population, encouraging Chinese political action (China Reforms). However, many believe that these advancements are not enough. According to acclaimed Chinese-American journalist Leslie T. Chang, a majority of city families will still only have one child due to the cost of education and living (Chang). These combined factors will likely prevent new laws from averting the predicted disaster of further age-based demographic imbalance. Instead, politicians should consider the possibility of lifting all limits for rural families, allowing for the agriculture sector to rise and provide a greater amount of food while also supporting a new industrial workforce for the future. This could be achieved through direct legislation on a national scale or even by granting greater autonomy to territorial government. However, because such a policy will likely create a notable population increase, it could revert Chinese society to previous conditions of food shortages and social unrest.

Since the initiation of the policy, human rights activists have taken a strong stance against the one-child policy. Practices like forced abortions and sterilizations have been seriously

condemned. While these critics advocate completely eliminating the policy, such steps are unfeasible for the Chinese government at this point in time, as such practices have become accepted and culturally ingrained.

Therefore, our second solution promotes ending direct violations of women's bodies through international public awareness. Already, organizations like Women's Rights Without Frontiers have made serious impacts on reducing the number of total abortions from 14 million in 1983 to 6.5 million in 2011, with the majority of the reduction representing forced abortions (Johnston). Such successes were achieved by furthering public understanding of the situation in China through news and media campaigns. More recently, a photo of the forced abortion of Feng Jianmei's seven-month-old fetus went viral in both China and the United States, creating a wave of backlash against these policies. According to NPR, standard comments such as "this is first-degree murder" were representative of enraged ordinary citizens, prompting the Chinese government to take action (Beech). As chief editor Hu Xijin of the Global Times (China's nationalist newspaper) reported the treatment of Feng as "barbaric", Chinese officials promised the family compensation of $11,200 and the arrest of the responsible officials. Only such drastic media attention forced recognition by the Chinese government; therefore, further exposing cases to public media through methods like photojournalism will elicit a reasonable response (Beech). Sending greater numbers of journalists to China and raising awareness of organizations that provide resources for victims will both allow for the cruelest of these rights violations to end.

However, even media attention will not always provide full cooperation and strong response desired from the Chinese government. For example, it is clear that efforts to help Feng were meant primarily to appease the public; Feng's husband Deng Jiyuan was brutally beaten and harassed by local officials after seeking legal counsel, while community members were

coerced into berating the family (Wong). While media recognition does hold the government and its officials more accountable their unlawful acts, it will not completely solve the problems for victims or end all potential cases of forced abortions.

Conclusions:

While the one-child policy has drastically reduced China's population and birth rate, only now can the adverse effects truly be seen. Studies have consistently demonstrated that the estimated reduction of 250 million people in China has relieved significant pressure on "communities, state, and the environment." However, the costs on society as a whole have been much greater. The negative psychological impacts of a dramatic change in culture, genetic defects, and forced abortions are inherently connected to the reduction of personal freedom ensured by the policy. Furthermore, blatant human rights violations have hurt millions of individual Chinese people.

While these concepts of controlling the actions of the people are inherent within the communist ideology, economic incentives may be the greater motivation for continuing the policy. Not only do policy officials steal the mandatory social support fees from violators of the law; the reduction of people provides greater job security and employment opportunities. However, this will likely backfire as evidence accumulates suggesting that limiting the population will create a greater proportion of elderly people that require dependence on the younger generations. This will reduce economic productivity and create new unprecedented costs for the government, in turn harming all of Chinese society. Only by attacking the policy's most egregious rights violations and presenting solutions that still allow control by the communist government will current and future societal difficulties be alleviated.

Word Count: 2,997

Works Cited

Beech, Hannah. "China: Forced-Abortion Victim Promised $11,200, but Family Fears for Life." *TIME*. Time Inc., 13 July 2012. Web. 8 Feb. 2015.

Bingli, Zhao. "Family Planning Law and China's Birth Control Situation." Interview by Hu Huiting. *China Through A Lens*. China.org.cn, 18 Oct. 2002. Web. 15 Jan. 2015.

Chang, Leslie T. "Why the One-Child Policy Has Become Irrelevant." *The Atlantic*. Atlantic Media Company, 20 Mar. 2013. Web. 24 Jan. 2015.

"China's 'One-Child Family' Policy." *Human and Civil Rights: Essential Primary Sources*. Ed. Adrienne Wilmoth Lerner, Brenda Wilmoth Lerner, and K. Lee Lerner. Detroit: Gale, 2006. 216-218. *Gale Virtual Reference Library*. Web. 24 Jan. 2015.

“China's Demographic Crisis." *The Economist*. The Economist Newspaper, 07 May 2011. Web. 1 Feb. 2015.

"China Reforms One-child Policy." *BBC News*. British Broadcasting Corporation, 28 Dec. 2013. Web. 26 Jan. 2015.

D' Onofrio, Brian M., Dr, Martin E. Rickert, Dr, Ralf Kuja-Halkola, Catarina Almqvist, Dr, Sjölander, Dr, Henrik Larsson, Dr, Paul Lichtenstein, Dr, and Emma Frans. "Paternal Age and Offspring Morbidity." *JAMA Network*. JAMA Psychiatry, Apr. 2014. Web. 08 Feb. 2015.

Drucker, Donna J. "One-Child One-Family Policy." *Encyclopedia of Sex and Gender*. Ed. Fedwa Malti-Douglas. Vol. 3. Detroit: Macmillan Reference USA, 2007. 1086. *Gale Virtual Reference Library*. Web. 27 Jan. 2015.

Fitzpatrick, Laura. "China's One-Child Policy." *Time*. Time Inc., 27 July 2009. Web. 25 Jan. 2015.

Franken, Owen. "China's 'One-Child Family' Policy." *Human and Civil Rights: Essential Primary Sources*. Ed. Adrienne Wilmoth Lerner, Brenda Wilmoth Lerner, and K. Lee Lerner. Detroit: Gale, 2006. 216-218. *Gale Virtual Reference Library*. Web. 1 Feb. 2015.

Germain, Anthony. "Rethinking China's One-child Policy." *CBCnews*. CBC/Radio Canada, 28 Oct. 2009. Web. 25 Jan. 2015.

Guilford, Gwynn. "China's One-Child Policy Cash Machine." *The Atlantic*. Atlantic Media Company, 05 Dec. 2013. Web. 27 Jan. 2015.

Hays, Jeffrey. "ONE-CHILD POLICY IN CHINA." *ONE-CHILD POLICY IN CHINA*. N.p., 2013. Web. 27 Jan. 2015.

Holliday, Katie. "Relaxing China's One-child Policy: The Economics." *CNBC*. 15 Nov. 2013. Web. 27 Jan. 2015.

Jia, Bing. "Formulation of the One-Child Policy." Web log post. *Law Librarians of Congress*. The Library of Congress, 19 Nov. 2013. Web. 14 Jan. 2015.

Jin, Xiaoyi, Li, Shuzhuo, Feldman, Marcus W. "Marriage Form and Son Preference in Rural China: An Investigation in Three Counties*." *Rural Sociology* 4(2007):511. *eLibrary*. Web. 24 Jan. 2015.

Jochim, Christian. "Confucianism." *Worldmark Encyclopedia of Religious Practices*. Ed. Thomas Riggs. Vol. 1: Religions and Denominations. Detroit: Gale, 2006. 273-299. *Gale Virtual Reference Library*. Web. 25 Jan. 2015.

Johnston, Robert."Historical Abortion Statistics, PR China." *Johnston's Archive*. Wm. Robert Johnston, 27 Dec. 2014. Web. 8 Feb. 2015.

Kane, Penny, and Ching Y. Choi. "China's One-Child Family Policy." *British Medical Journal* 319 (1999): 992-94. *Gale*. Web. 17 Jan. 2015.

Page, Jeremy. "China's One-Child Plan Faces New Fire." *WSJ*. The Wall Street Journal, 29 Apr. 2011. Web. 2 Feb. 2015.

Simons, John. "Religions, Population Doctrines of." *Encyclopedia of Population*. Ed. Paul Demeny and Geoffrey McNicoll. Vol. 2. New York: Macmillan Reference USA, 2003. 830-835. *World History in Context*. Web. 2 Feb. 2015.

Wong, Edward. "Forced to Abort, Chinese Woman Under Pressure." *The New York Times*. The New York Times Company, 26 July 2012. Web. 8 Feb. 2015.

World Trade Press. "China: Cultural Overview." *AtoZ World Culture*. World Trade Press, n.d. Web. 25 Jan. 2015.

Zimmer, Zachary. "Family Size and Support of Older Adults in Urban and Rural China: Current Effects and Future Implications." *ELibrary*. 1 Feb. 2003. Web. 27 Jan. 2015.

Federal Funding for NASA

The National Aeronautic and Space Administration, or NASA, a United States federal science agency responsible for science and technology through air and space, currently receives 0.4 percent of the government's total funding according to a Whitman College speech. NASA is currently struggling with the low amount of money they are provided with, despite helping with the development of new technology and its impact on the environment, the government, and foreign aid. The funding for NASA has proved to be costly to the American economy, but this program has been proved to be very beneficial to America and can potentially be vital for American way of life in future years.

Historical Background and Defining

Beginning in 1957, NASA was created in response to the Soviet Union's launch of Sputnik 1, the first artificial satellite launched into space, thus starting the Space Race, as shared by NebraskaStudies. It was during this time that United States education system focused on math and science in efforts to further America's progress in the Space Race between the Soviets in competition for global power. Funding during this time peaked all in contention for the United States to stay ahead of the Soviet Union during the space competition between these two nations. It would be until later years of the Space Race would the Soviet Union drop out due to their economic crisis leading to bankruptcy. In turn, the United States federal government would spend a decreasing amount of funding on NASA as their efforts did not seem as vital to U.S. way of life. Even with the budget cuts, NASA has provided vast amounts of benefits even on a global scale. In Laymen terms, a benefit refers to "something that is advantageous or good" as defined by Dictionary.com. This definition is required to complete an effective examination of the topic of NASA's

funding. Should NASA receive an increase in funding, then the amount of benefits provided would also in turn increase.

Revenues

There are so many possibilities for the future of NASA because the funding can be provided through potentially limitless ways. Mechanical Engineer Major Michael McBrien informs that some may say the United States cannot economically afford NASA, the estimated revenue at 2-to-1 and 3-to-1 ratios, because NASA has developed many technologies such as the TemperPedic, which branched out after being developed for astronauts who had to sit motionless for hours. The revenue has been proven to be difficult to determine for many reasons but mostly in part by the technologies that end up branching out from NASA. Also, the development of TemperPedic and other technologies have created many new jobs, which lead to a rise of new companies and an increase in NASA's total revenue. Increasing the funding for NASA could possibly lead to the development of even more technologies and jobs creating a more efficient economy. Currently, NASA is planning to launch ships into space with the purpose of mining asteroids for minerals that can be used for countless ways. Internet Services Manager for NASA Brian Dunbar implies that NASA has plans to mine these resources for various materials on asteroids. The extraction of these resources has allowed for the NASA investments to profit and lead to vast amounts of wealth in return. In the government's hands, the money could be used as a supporting mean and form of civil service.

Technologies

In order to help extract new resources from asteroids, NASA has further created new technologies. Jason Crusan, director of Advanced Exploration Systems, stated that a

lot of the technologies have broader use outside of space exploration, which can be related with NASA's program advances in observation technology, such as satellite observation, technology development, research and analysis, and applications leading to new and enhanced space-based observations and information systems. The science research and analysis of satellite observations and model results improve predictability and knowledge of the global integrated earth system. Furthermore, the research provides high resolutions observations of variables relevant to global change research, thus proving Crusan's input of technologies having more uses outside of space explorations. With the rising amount of people on earth, life sustaining materials are running low and NASA believes that other planets may contain these necessities. A lot of these technologies have been used to even help detect natural disasters with improved satellites (Dunbar). The creation of these technologies, which will be used outside of space travel, have allowed for earlier detection of natural disasters, such as tsunamis, hurricanes, earthquakes, or floods at a more rapid pace and in turn allow more time to prepare before disaster strikes. Being ready for these natural disasters can save lives and lessen overall damage, which increasing the funding for NASA can allow for relief teams to arrive to the scene of the disaster faster and to prevent more casualties, thus creating a huge advantage for those trying to escape and make their way to safety. Furthermore, according to Charles Bolden, a NASA Administrator, by studying the sun, NASA can better understand weather patterns. Determining weather patterns can help farmers pick the best spots of the year for crop yield, which in turn can equate to an improved economy for more production of goods to be sold to a market at a healthier and higher quality rate. Developments of new technologies from NASA such as satellite radars have extreme potential to improve the economy and even human health.

Environmental Policy

Dating back to the Space Race during the Cold War beginning in 1957, the United States government shifted schools to focus on math and science, which made the government lead to little concern to the environment of the United States, and would then influence the environment in a negative manor. The U.S. NASA program would eventually discover environmental harm produced by not only the program but for the U.S. during the Cold War, specifically the Space Race. The United States Environment Protection Agency concluded that the U.S. ignorance of the environment during this time would lead to huge emissions of carbon dioxide and other greenhouse gases being released into the air mostly by the U.S. industries. In response to greenhouse gas emissions into the atmosphere, the National Environmental Policy Act, or NEPA, of 1969 stated that an Environmental Impact Statement, or EIS, which is a federal action that has potential to significantly affect the quality of the environment, would be required to, by all branches of the government, was passed to give proper consideration to the environment before making an EIS (Dunbar, Overview of the National Environmental Policy Act). This Act was NASA's main response to improving the environment and to negate possible scenarios where the United States Congress passes a different act that could potentially damage the environment. The NEPA, on the other hand, can nullify a possible bill that could improve the United States economy, technology, or other means. Although this may occur, the NEPA still allocates for protection of the environment for healthier lifestyles.

Effect on Corporations and Countries

The NASA program also has many influences on multiple corporate businesses. Starting with her 2014 article, Carolyn Turner, NASA Deputy of Ground Safety who has

looked into NASA influences on other federations, reports that two federal agencies, the U.S. Department of the Interior's Bureau of Land Management and the U.S. Fish and Wildlife Service manage identical actions to NASA's passage of the NEPA. These similar actions of the two corporations allowed for a proposed EIS to be filed under obligations of the NEPA. Turner's analysis of the NASA regulation having effects on other corporations to protect and improve the environment shows NASA's effects on other organizations on the federal level. The affect of NASA on other organizations even passes through the federal level and extend to a global manner. As of October 2012, NASA has 572 international agreements with about two-thirds of the world's countries regulating socio-economic orders, as concluded by The Tauri Group. This evidence supports the conclusion that NASA has influence with other environmental corporations along with other countries as seen with the NEPA and socio-economic pacts. Furthermore, NASA's efforts to enhance the environment are being carried out by other environmental organizations that have further branched out to a global level. These agreements also improve education within the nation with investment in the Science, Technology, Engineering and Math education program (STEM), increase international and educational exchange, and the agreements expand international and science partnerships. The investment in the STEM program relates back to the environment by allowing stronger education and connections between the world's countries to potentially create new inventions to improve the environment. Bharath Gopalaswamy, Deputy Director of the South Asia Center at the Atlantic Coast, further explains NASA's potential to unite countries by showing the "…strengthening space collaboration not only produces results in outer space but also has the potential to increase collaborative opportunities for universities, advance science and technology research and develop human capital." The advances in science and technology have helped improve the environment by establishing new strategies to preserve and improve the environment

through modernized tactics, showing in the end how NASA's efforts have even allowed for the world to unite closer with one another.

Climate Change and Research

Along with connecting the universe through a multitude of means to advance science and technology which can potentially improve the environment, NASA has also allocated for modern research on climate change. To depict a better understanding of climate change, sea level rise, and weather occurrences, NASA has been studying the earth and current trends concerning the changing environment (Bolden). Climate change and the rising sea level have proved to be two of the biggest mysteries about the environment. The studying of these changed allowed NASA to learn how these changes could affect occurrences in weather and help to intrigue the next generation. The climate change is a problem that must be faced as evidence of the shifting atmosphere can be observed in polar seas and ice sheets, atmospheric composition, carbon shortage in the Arctic, as well as hurricanes in the Atlantic Ocean and soil moisture in North America, attributing to the global environment, economy, and human activities as shared by GlobalChange. The global climate change potentially impacts policies supposing to stabilize the environment, economy, and human activities by altering current temperatures which can prove to be rather drastic.

Aside from all the benefits of the funding of NASA pertaining to the environment, there are also risks to consider. Starting in his 2011 paper, Senior Project Engineer of Commercial Launch Projects Martin Ross insights that with every rocket launch, black carbon is emitted which can contribute to climate change, according to a study by The Aerospace Corporation. Ross later explains the black carbon absorbs heat from the sun which can change the overall circulation of the atmosphere and cause regional changes in

temperature and ozone. Although NASA has put black carbon in the atmosphere, Ross maintains that in response to black carbon emitted by NASA rocket launches, current launches of hydro-carbon fueled orbital rockets produce one-tenth of the mass of black carbon particles into the stratosphere than previous designs. The creation of a modernized way to launch rockets into outer space allows for cleaner air. By having less black carbon being exhausted into the air, NASA has created a way that allows for the atmosphere to be more eco-friendly while containing the same rate of exploration and scientific research conducted previous to the modernized eco-friendly rockets. However, many are still viewing NASA with haste as to how the rocket launches still pertain to climate change, despite the reduced rate. Although there are differing opinions on how exactly NASA is regulating climate change, experts generally agree that NASA is taking the needed steps in order to reduce and possibly deplete causes of climate change at a miniscule scale.

Politics

Being a United States federal science agency, politics play a critical role is the funding of NASA. The government has been in a debate for multiple decades regarding the amount of funds allocated for NASA. According to The Monitor's Editorial Board, current U.S. President Barack Obama has taken a very liberal stand on NASA which could be seen when "Obama backed down on his proposal to cancel a Bush-era program called constellation". The Constellation Project was a project where Americans would return to the moon to research topics such as creating new methods for fuel. Although the program has ended, the government is still debating on the project and whether the project should be conducted. Around the same time the Communist country of China has been preparing for a moon landing exposition in the next few years. Should the Chinese land on the moon, America's power in space could be in jeopardy. NASA is a very expensive program and

funding this program does require a rather large sum of money. Although, due to all of the inventions NASA has made and the scientific knowledge that NASA has provided to not only America but even the world, the program should be funded due to the amount of benefits that NASA provides. President Obama, who is a strong supporter of NASA, would later explain his thoughts on the funding of NASA that "the space program improved lives, advanced society, strengthened (the U.S.) economy, and inspired generations." NASA has improved life in a multitude of ways with everyday use items that NASA has created and scientific knowledge, proving to be a beneficial factor for U.S. society. NASA has kept employment high, especially with creation of new jobs, and the U.S. keeps the economy running. Should the NASA program be canceled, the U.S. could experience problems with inflation that could ruin the U.S. economy. In tandem, the government should fund programs such as the Constellation Project so that America can keep its leadership in space and even advance American scientific understanding of the universe.

Solution and Conclusion

A solution regarding funding is always a struggle, especially when the funds should be increased, considering that money cannot be generated from nothing and easily distributed to anything in need. According to a recent study surrounding the United States federal spending, "for every $1 the federal government spends on NASA, it spends $98 on social programs. In other words, if [the government cuts] spending on social programs by a mere one percent, [they] could very nearly double NASA's budget." Whether a very slight cut from social programs to nearly double NASA's budget is the greatest area to cut spending, the benefits that NASA would provide with a more sufficient budget would be vast.

From an economic perspective, NASA creates many new jobs and technologies that are used globally that could increase the United States economy, even if the program receives more funding. The higher funding from the government would then allow for an even greater increase for jobs, which can help the United States' unemployment, and potentially develop new technologies that can benefit the globe in many ways. From an environmental stand point, NASA policies can even unite the globe. Its regulations and agreements are adopted by other corporations and even countries to help improve the environment that surrounds all of the people. Also, NASA can make more progress with the earth's mysteries concerning rising ocean levels and climate change. Politically, NASA's increased budgets will allow for continuation of projects such as the Constellation Project, which would in turn allow the nation to become more scientifically and technologically advanced and the ability to receive even more benefits from NASA. Finally, President Obama once told America, "Space exploration is not a luxury, not an afterthought in America's brighter future, but an essential part of that quest."

Works Cited

"Policy Speech: NASA Funding Speech." *Whitman College*. 12 Jan. 2015.

"The Space Race." *NebraskaStudies.* NebraskaStudies. 11 Jan. 2015.

Benefits. *Dictionary.com Unabridged.* Retrieved February 9, 2015.

McBrien, Michael "NU Writing" *NU Writing.* 12 Jan. 2015.

"Confronting the Climate Challenge: Science and Policy Working Together." *MIT Joint Program on the Science and Policy of Global Change.* MIT. 11 Jan. 2015.

Dunbar, Brian. *NASA.* NASA, 29 Feb. 2012. 12 Jan. 2015

Bolden, Charles. "What's Next for NASA?" NASA. 1 July 2011. 14 Jan. 2015

"Global Greenhouse Gas Emission Data." *EPA.* United States Environmental Protection Agency. 9 Sept. 2013. 11 Jan. 2015.

Dunbar, Brian. "Overview of the National Environmental Policy Act." *NASA.* NASA, 27 Nov. 2007. Ed. Alex Pline. 11 Jan 2015.

Turner, Carolyn. "Wallops Flight Facility." *Wallops Flight Facility*. Ed. Brandon Wright NASA, 10 Jan. 2014. 11 Jan. 2015

"NASA Socio-Economic Impacts." *NASA Socio-Economic Impacts.* The Tauri Group. Apr. 2013. 15 Jan 2015.

Gopalaswamy, Bharath. "Cooperation, the Final Frontier." *US News*. U.S. News & World Report, 26 Sept. 2014. Feb. 4 2015.

"National Aeronautics & Space Administration." *GlobalChange.gov*. GlobalChange. 11 Jan. 2015.

Ross, Martin. "Rocket Soot Emissions and Climate Change." *Aerospace*. Aerospace, 10 July 2011. 11 Jan. 2015.

Chow, Denise. "Funding Drought Jeopardizes Future NASA Astronomy Missions." *Space*. 12 Jan. 2015

"Ethically Navigating Space Exploration." *Space Exploration*. 12 Jan. 2015.

"The Future of NASA's Commercial Partnerships." *The Space Review*. 2 Feb. 2015.

"NASA and Obama's Budget the Politics and Ideals of Human Space Exploration." *The Christian Science Monitor*. The Monitor's Editorial Board. 16 April, 2010. 14 Jan. 2015.

Grantham, William. "NASA Future Mission Needs and Benefits of Controls-Structures Interaction Technology." *NASA*. NASA. 14 Jan. 2015.

Maertz, Chris. "What is the Furture of NASA?" *Commonplace*. The McGraw Companies. 2 Feb. 2015.

AP® SEMINAR
2015 SCORING COMMENTARY

Performance Task 1 — Written Team Report

Overview

This prompt was intended to:

- Assess the students' ability to conduct collaborative research; and
- Assess the students' ability to collaborate in the development of a cohesive, well-written argument on a chosen topic.

Sample: A
Content Area: Understanding and Analyzing Context — Row 1 Score: 6
Content Area: Understanding and Analyzing Perspective — Row 2 Score: 6
Content Area: Selecting and Using Evidence — Row 3 Score: 6
Content Area: Building and Communicating an Argument — Row 4 Score: 6
Content Area: Selecting and Using Evidence — Row 5 Score: 3
Content Area: Grammar and Style — Row 6 Score: 3

HIGH SAMPLE RESPONSE

Content Area: Understanding and Analyzing Context — Row 1
The response earned 6 points for this row because the report poses a well-defined question with a high degree of complexity, places the question in a clear and relevant context, and provides a compelling rationale for research inquiry ("…evidence compiled from the scientific, political, and ethical lenses has made it evident that the benefits of ESC research outweigh the ethical controversies associated with it, and further actions by the United States government must be taken").

Content Area: Understanding and Analyzing Perspective — Row 2
The response earned 6 points for this row because the report identifies relevant perspectives, critically evaluates the validity and credibility of the arguments, and conveys a complex line of reasoning. The line of reasoning demonstrates a clear and elevated understanding of logical alignment with conclusions (e.g., "So by using these cells for research, the "life" of them has actually been saved. It is in this way that the ethical controversy can be looked at from a different point of view and be portrayed in a less harsh light").

Content Area: Selecting and Using Evidence — Row 3
The response earned 6 points for this row because the report effectively synthesizes evidence from multiple perspectives to builds its complex argument.

Content Area: Building and Communicating an Argument — Row 4
The response earned 6 points for this row because the report presents complex and well-reasoned conclusions and solutions based on previously offered evidence. It is somewhat flawed in that it fails to provide specific numbers when referencing funding issues. The response does not provide an assessment of the current funding for embryonic and the projected funding needed for continuation of embryonic research (e.g., "… we recommend that the U.S. federal government continue investing in embryonic stem cell research…. Government support is needed to make sufficient advancement on the research and application of ESCs within medicine" and "That is the reason why the federal government of the United States must fund ESC research on stem cells obtained from embryos donated from fertility clinics to better the lives of our posterity").

AP® SEMINAR
2015 SCORING COMMENTARY

Performance Task 1 — Written Team Report

Content Area: Selecting and Using Evidence — Row 5
The response earned 3 points for this row because the report appears to accurately attribute and cite sources used. The reference page includes all referenced sources and is consistent and complete in citation elements.

Content Area: Grammar and Style — Row 6
The response earned 3 points for this row because the report contains few flaws in grammar and style and clearly communicates to the reader.

Sample: B
Content Area: Understanding and Analyzing Context — Row 1 Score: 4
Content Area: Understanding and Analyzing Perspective — Row 2 Score: 6
Content Area: Selecting and Using Evidence — Row 3 Score: 4
Content Area: Building and Communicating an Argument — Row 4 Score: 4
Content Area: Selecting and Using Evidence — Row 5 Score: 3
Content Area: Grammar and Style — Row 6 Score: 3

MEDIUM SAMPLE RESPONSE

Content Area: Understanding and Analyzing Context — Row 1
The response earned 4 points for this row because the report poses a complex question that is placed in a clear context. The response states, "The policy has not only made lasting impacts on Chinese culture and society due to its unethical and coercive nature, but has also heavily skewed population composition. The policy's inherent basis in communism has also created an economically focused 'one-child bureaucracy' within the government." The response also provides a compelling rationale for the research process. The response explains, "We chose to explore this topic primarily due to the many accounts of modern human rights violations in China. Recent media attention has educated the United States on the scope of control that the policy has over the Chinese people."

Content Area: Understanding and Analyzing Perspective — Row 2
The response earned 6 points for this row because the report identifies and clarifies multiple perspectives: historical and political, economic, scientific, and cultural. The response also critically evaluates the validity of the argument and conveys a clear line of reasoning that aligns to the conclusion of the argument. The response's conclusion states that "While the one-child policy has drastically reduced China's population and birth rate, only now can the adverse effects truly be seen. Studies have consistently demonstrated that the estimated reduction of 250 million people in China has relieved significant pressure on 'communities, state, and the environment.' However, the costs on society as a whole have been much greater. The negative psychological impacts of a dramatic change in culture, genetic defects, and forced abortions are inherently connected to the reduction of personal freedom ensured by the policy. Furthermore, blatant human rights violations have hurt millions of individual Chinese people."

Content Area: Selecting and Using Evidence — Row 3
The response earned 4 points for this row because the report synthesizes evidence to build the argument. For example, the report analyzes cultural influences that might have had an impact in Chinese family structure. In addition, the report includes in its evaluation that "Vast differences in family composition throughout provinces in China suggest that religious and philosophical

traditions had little influence on the one. Both Buddhism and Confucianism did, however, establish many of the traditions that prioritized males over females."

Content Area: Building and Communicating an Argument — Row 4
The response earned 4 points for this row because the report offers more than one solution and indirectly acknowledges the implications. However, the report is weakened when it offers one solution after another only to point out how each might not work. For example: "This could be achieved through direct legislation on a national scale …. However, because such a policy will likely create a notable population increase, it could revert Chinese society to previous conditions of food shortages and social unrest" or a comment such as "… even media attention will not always provide full cooperation and strong response desired from the Chinese government." The back-and-forth play of ideas ends with the conclusion that "Only by attacking the policy's most egregious rights violations and presenting solutions that still allow control by the communist government will current and future societal difficulties be alleviated."

Content Area: Selecting and Using Evidence — Row 5
The response earned 3 points for this row because the report accurately attributes and cites the sources used. The bibliography format is consistent and includes all the referenced sources.

Content Area: Grammar and Style — Row 6
The response earned 3 points for this row because the report had few flaws in grammar and clearly communicated to the readers.

Sample: C
Content Area: Understanding and Analyzing Context — Row 1 Score: 2
Content Area: Understanding and Analyzing Perspective — Row 2 Score: 4
Content Area: Selecting and Using Evidence — Row 3 Score: 2
Content Area: Building and Communicating an Argument — Row 4 Score: 2
Content Area: Selecting and Using Evidence — Row 5 Score: 1
Content Area: Grammar and Style — Row 6 Score: 2

LOW SAMPLE RESPONSE

Content Area: Understanding and Analyzing Context — Row 1
The response earned 2 points for this row because the report poses a problem simplistically (e.g., "The funding for NASA has proved to be costly to the American economy, but this program has been proved to be very beneficial to America …") and places the problem in a limited context. In addition, the report provides a weak rationale for the research process with vague language (e.g., "… and can potentially be vital for American way of life in future years").

Content Area: Understanding and Analyzing Perspective — Row 2
The response earned 4 points for this row because the report presents relevant perspectives: (a) Economic; (b) Technology; (c) Corporations; (d) Environmental; and (e) Political. However, the argument demonstrates a limited understanding of the arguments. For example, the response provides evidence of NASA's global influence, but the evaluation is limited to only "how NASA's efforts have … allowed for the world to unite closer with one another."

AP® SEMINAR
2015 SCORING COMMENTARY

Performance Task 1 — Written Team Report

Content Area: Selecting and Using Evidence — Row 3
The response earned 2 points for this row because the report cites limited relevant evidence to build its argument. Many of the claims are supported with one or two sources and unsupported opinion is offered heavily throughout. For example, the response cites only two vague sources for the NASA's potential to generate revenue ("Mechanical Engineer Major Michael McBrien informs …" and "Internet Services Manager for NASA Brian Dunbar implies …"). Likewise, the response provides primarily one source (Dunbar) and only generally mentions other sources for NASA's contributions to technology and NASA's response to environmental concerns.

Content Area: Building and Communicating an Argument — Row 4
The response earned 2 points for this row because the report offers a simplistic solution and conclusion. It suggests that "if [the government cuts] spending on social programs by a mere one percent, [the government] could very nearly double NASA's budget." No evidence is offered that supports the report's conclusion or solution.

Content Area: Selecting and Using Evidence — Row 5
The response earned 1 point for this row because the report includes many errors in attribution and citation.

Content Area: Grammar and Style — Row 6
The response earned 2 points for this row because the report contains some flaws in grammar and the style minimally interferes with communication to the reader.