

Running head: DARE WE PLAY GOD

Dare We Play God and Build a Human?

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Abstract

Human cloning is currently a polarizing issue in religious, scientific, and ethical debates. This research investigated the history and ethical viewpoints of human cloning. Roslin Institute first brought the possibility of human cloning to the public's attention with the successful cloning of Dolly the sheep in 1977 (United States Department of Energy Genome Program, 2009). Thanks to Dolly, human cloning became a major ethical concern. The science and technology regarding cloning continues to be developed, researched, and tested. However, there are numerous risks, benefits, and arguments about cloning; therefore, the ethical debates continue. For Christians, God is seen as the One who creates humans in the womb; therefore, humans attempting to create life is debatable. Others believe that the cloning benefits outweigh the risks. While human cloning might not be entirely safe to perform yet, scientists are working on perfecting the techniques of cloning.

This year, the researcher studied the image of human cloning in five films utilizing a researcher-designed questionnaire. After the questionnaires were completed, the results were collected and placed into pie charts. The questionnaires' results generally portrayed the films as negative. A 1-proportion z-test was performed on the first question in the *Overall Image* section, which concluded that the probability of observing 0 neutral films, if the null hypothesis were true, was 0. Together, the questionnaire and the statistical test provide evidence to reject the null and accept that *Films do not present a neutral image of human cloning.*

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To clone or not to clone? This is a major question in political, religious, scientific, and ethical debates ever since the possibility of human cloning has become known. Human cloning has been a major theme in science fiction novels and movies, but scientists from the Roslin Institute in 1997 first brought the actual possibility of human cloning to the public's immediate attention with the successful cloning of the sheep, Dolly (United States Department of Energy Genome Program, 2009). Thanks to Dolly, human cloning became a major ethical concern and continues to be one of the major debates in all areas of study. Therefore, this researcher poses the question: *What is the science and history of human cloning from the 1980s to 2008 and what are the main ethical viewpoints on the subject of human cloning?*

Science of Cloning Humans

The science behind cloning has been around for many years and can be divided into three distinct categories: recombinant deoxyribonucleic acid (DNA) technology or DNA cloning, therapeutic cloning, and reproductive cloning (United States Department of Energy Genome Program, 2009). These three types have very specific purposes and very different conclusions. Each category of cloning builds on the previous one, which leads to the ever-growing possibility of a human clone.

DNA Cloning

DNA cloning has many terms, including *gene cloning*, *recombinant DNA technology*, and *molecular cloning*, but these terms all mean the “transfer of a DNA fragment of interest from one organism to a self-replicating genetic element, such as a bacterial plasmid” (United States Department of Energy Genome Program, 2009, Recombinant DNA Technology or DNA Cloning section, ¶ 3). This is common practice in laboratories today,

ever since creation in the 1970s. To clone genes, DNA fragments containing the genes are joined with plasmid, usually a type of bacteria. Soon after, the recombinant DNA can begin reproducing with the host cell (United States Department of Energy Genome Program).

This results in cloned DNA.

Therapeutic Cloning

Therapeutic cloning, or embryo cloning, is “the production of human embryos for use in research” (United States department of Energy Genome Program, 2009, Therapeutic Cloning section, ¶ 9). The goal is to harvest stem cells for research, not to fully create cloned humans. The harvested stem cells are used to study and treat diseases and learn about human development. However, when extracting stem cells from the egg, the embryo is destroyed (United States Department of Energy Genome Program).

Reproductive Cloning

Reproductive cloning, also known as adult cloning, is used to create an animal with the same DNA as a previous animal (Sateesh, 2008). Scientists use a process called somatic cell nuclear transfer (SCNT), which can create an “unlimited number of genetically identical individuals” (Logston, 1999, Nuclear Somatic Cell Transfer section, ¶ 1). Through SCNT, scientists remove the nucleus of an egg and inject new genetic material from a donor cell into the egg. Next, the redeveloped egg is “treated with chemicals or electric current in order to stimulate cell division” (United States Department of Energy Genome Program, 2009, Reproductive Cloning section, ¶ 6). Then, the egg is transferred to the female host animal to finish developing in the uterus.

Despite popular belief, reproductive cloning does not create an identical clone of the donor. Part of the clone’s DNA comes from the mitochondria in the cytoplasm, which

contains its own short segments of DNA. Mutations within the mitochondrial DNA is believed to be the reason for oddities in a clone's aging process (United States Department of Energy Genome Program, 2009).

The science behind these cloning technologies is difficult, continually being advanced, and are stepping-stones for future research. Scientists use DNA cloning to join DNA fragments with plasmid to clone DNA. Therapeutic cloning is used to produce human embryos for research purposes. Reproductive cloning continues past therapeutic cloning to create a fully developed clone. These three procedures have taken years to develop, beginning with the science of genetics, but especially with certain advances in the late Twentieth Century.

History

The study of genetics has been around since the mid-1800s, beginning with traits and characteristics passed on to new generations, as seen in Charles Darwin's ideas of natural selection and Gregor Mendel's studies of pea plants (Mikail, 2008; Lane, 1994). However, the science of cloning did not become serious until the 1980s and 1990s. Due to Neal White's discoveries of the G0 stage and the Roslin Institute's many successes in cloning livestock (Logston, 1999), reproductive human cloning comes closer to being a real possibility.

G0 – Ready, Set, Hibernate

In 1994, one of Neal White's technicians at the University of Wisconsin accidentally discovered a hibernation phase in cells (Logston, 1999). White had obtained donor embryo cells from a cow to research. His technician did not properly nourish these donor cells, which caused the cells to "[step] out of their normal cycle of growth and [divide]" (Logston,

Really, How Much of a Surprise Was Dolly? section, ¶ 3). The cells paused in a kind of hibernation phase which scientists named G0. This hibernation stage intrigued scientists because the cells in G0 seemed easier and more adaptable to cloning techniques (Logston). G0 would go on to inspire Ian Wilmut and Keith Campbell to begin experimenting with cloning and to create Dolly (Logston).

Dolly

On July 5, 1996, at 5:00 pm, Dolly, the first mammal cloned from an adult donor cell, was born (Logston, 1999). A year later, in 1997, Ian Wilmut announced that he and his team had cloned a sheep (Kluger, 2008). This event put all types of cloning at the forefront of debates and is considered the beginning of the age of cloning technology (Arnold, 2009). While not the first animal to be cloned, Dolly was the first animal to be cloned from an adult cell (McKinnel & Di Berardino, 1999). The possibility of cloning from cells in the G0 stage intrigued Ian Wilmut and K.H.S. Campbell, Scottish scientists from the Roslin Institute, to start researching and testing (Logston). After ten years of researching and testing, these scientists developed SCNT, a variant of nuclear transplantation (Morgan, 2009). Through SCNT, Wilmut and fellow researchers implanted twenty-nine embryos into an ewe, but only one resulted in a live birth, Dolly (Logston). This success was a major milestone in cloning technology.

Polly

In August of 1997, the Roslin Institute made another significant announcement (Logston, 1999). Their team of scientists and researchers had accomplished their goal of cloning an animal with a human gene (Panno, 2005). Polly, named after her breed, the Poll Dorset Sheep, was the result: the first lamb with a human gene, a blood-clotting protein

called Factor IX (Cohen, 2002). She was actually a real prize for scientists because Polly “[symbolized] potentially lucrative interventions in which cloning is a mechanism for efficiently modifying the genomes of animals for human medicine” (Klotzko, 2001, pp. 263). Polly shows the prospect that cloned organs in mammals can be used for gene therapy (Pence, 1998). Cloned organs would be easily created with a patient’s genetic material to insure a more successful transplant which would easily save more lives (Cullen, 2009).

Though genetics started centuries ago, the age of cloning has only recently begun. Through Neal White’s discoveries and the Roslin Institute’s advances (Logston, 1999), human cloning could soon be a possibility. Even if scientists do develop a foolproof way to clone humans completely, there are still varying ethical views on the subject of human cloning.

Ethical Viewpoints

There are various ethical views on human cloning. Many people, including scientists, politicians, theologians, and ethicists, believe that human cloning should at least have many restrictions placed upon it, if not be banned completely (Fitzgerald, 1997). Others believe that cloning is the next logical step because the benefits outweigh the drawbacks. Some are hesitant and think scientists should only clone for certain reasons or be performed on animals only due to the risks in cloning humans. The two controversial types of human cloning are reproductive and therapeutic cloning; both create embryos but one leads to full growth and development while the other leads to research and eventually destruction.

Stop Now

People who view cloning as unethical believe this because they see cloning as “an immoral violation of human identity and dignity” (Kass, 2008, ¶ 3). Cloning technology

would have to be completely banned, because there would not be any way to regulate or limit cloning.

Immorality. There are many reasons why human cloning is seen as immoral but can be summed into three main reasons: the possibility of mass production of humans, the compromise of one's individuality, and replacements for dead children (Logston, 1999).

Cloning of humans in mass production can be seen as signs towards eugenic programs to control and manipulate humans into objects instead of people (Kass, 2008). Too much cloning could also lead to overpopulation; the world is already dangerously close to being full (Logston, 1999).

If human cloning started, it is most likely that people would look upon the clones as subpar or lesser beings to normally reproduced humans. According to Abigail Evans, human cloning should be refused because “[cloning] fosters a reductionistic rather than holistic view of human nature while treating people as means not ends”(Cole-Turner, 1997, p. 25).

Cloned children as replacements for dead children or even as new ones could lead to the clones being only objects to be designed and ruled over instead of precious gifts (Brinkley, 2008). Abigail Evans also argues that “[cloning] is not a necessary solution to any human tragedy” (Cole-Turner, 1997, p. 25). There are other alternatives to lost children.

Risks. Though there have been successful cases of cloning, such as Dolly and Polly, reproductive cloning has low success rates, is expensive, and very inefficient (United States Department of Energy Genome Program, 2009). In about 100 experiments, only one to two viable offspring are produced (United States Department of Energy Genome Program).

Also, almost all clones have had underdeveloped immune systems, more susceptibility to infections, tumor growths, various disorders, and shorter life spans (United States Department of Energy Genome Program). In addition to health risks, there is no way to know the mental impact on the clone, as emotions and intellect are unimportant to sheep. Even the United States Department of Energy Genome Program has stated that “with so many unknowns concerning reproductive cloning, the attempt to clone humans at this time is considered potentially dangerous and ethically irresponsible” (Should humans be cloned? section, ¶ 2).

Green Light

Those in favor of human cloning often look at nature’s will and examples of cloning already seen in nature. They compare clones to identical twins, who have the same DNA but grow up differently due to changed experiences and personalities (Easterbrook, 2009). To those in favor, the benefits of human cloning far outweigh risks and are not ethically wrong.

Nature. Many arguments for human cloning begin with nature. Natural selection and selective breeding are forms of genetic engineering done in nature and is not prescribed as immoral or unethical even though this could be seen as nature trying to play God (Kershen, 2006; Mikail, 2008). To some, “if cloning assists in [the] effort [to pass on our genes], nature would not be offended” (Easterbrook, 2009, ¶ 4). Also, scientists point to the fact that some species of plants and animals, including insects, amphibians, and even sharks, reproduce clonally through asexual reproduction which is a form of self-cloning (Easterbrook; *Asexual reproduction*, 2010). Another argument is that the purpose of the human race is to reproduce and continue the human line. Clones are already seen in the

world naturally so the human species should be able to clone, too, if it helps further the reproduction of the species through reproductive cloning (Easterbrook).

Benefits. Cloning will bring numerous advances to science (Kershen, 2006). This could be the way to save extinct or endangered species, cure diseases, and save lives (United States Department of Energy Genome Program, 2009). Therapeutic cloning could one day be used to replace whole organs, treat genetic conditions, and replace damaged cells by producing new, healthy cells (Cullen, 2009; United States Department of Energy Genome Program). Each year, thousands of patients must wait for organ donations; by cloning new organs, patients would not have to wait for the right match and many lives could be saved (Cullen). All genetic diseases and damaged cells could be treated easily because the patient's body would not reject new cloned cells that contain the patient's genetic material (Cullen). Reproductive cloning could be another option for infertile couples (Easterbrook, 2009; United States Department of Energy Genome Program).

While there are many benefits from human cloning, there are also many risks in such an undertaking. Human cloning could save people's lives by cloning organs or curing diseases. However, cloning is vastly unsuccessful and very expensive too complete but the main risks are to the clone's physical and mental health. Depending on one's point of view, these risks may or may not outweigh the benefits. Though scientists cannot safely clone and grow a human yet, the possibility is definitely coming. These ethical debates are trying to answer all questions before the possibility can actually occur. Many religious groups, including most Christians see human cloning as an act of playing God, pointing out key Biblical verses for support.

God, the Creator

Psalm 100:3 (English Standard Version) states, “Know that the LORD Himself is God; It is He who made us, and not we ourselves.” This psalm is especially applicable to the issue of human cloning for it directly says that only God creates, not humans. God made humans from unformed substance (*Cloning ethics*, 2010). Humans are a part of God’s creation, created in His image, and makes life precious (*Cloning ethics*). If humans are reduced to simply being another creature or object to be used for its parts, the value of life could decrease (*What is the Christian*, 2011). While most Christians believe that human clones would still be considered human beings with souls, others would not and thus treat the clones as lesser men (*What is the Christian*). Mankind may be seen as trying its hand at playing God in creating new humans, controlling life and death, or interfering with God’s plan (Brinkley, 2008).

Conclusion

Human cloning has greatly progressed since the 1980s to 2008. While human cloning might not be entirely safe to perform yet, scientists are well on their way to perfecting the techniques of this science. There have been many new advances through the last few decades to help perfect these techniques: the discovery of the G0 stage, which forces cells to divide and become more adaptable to cloning techniques, and the cloning of Dolly, the first mammal cloned from an adult donor cell, and Polly, the first lamb with human gene. The science and technology are continually being developed, researched, and tested; however, main ethical views remain the same about the possibility of human cloning: should scientists stop or continue? There are numerous risks, benefits, and arguments over cloning, and it remains a hotly debated subject. Many believe that the

potential physical, social, and emotional risks for clones are enough reasons to stop cloning all together. Almost all clones have had underdeveloped immune systems and shorter life spans. There is also no way to test the social and emotional risks for the clones. However, there are also many benefits to assess: genetic diseases could be overcome, lives could be saved by using new cells or organs to repair damage, and infertile couples could have the possibility of their own child. As stated in the Bible, God is the only one who creates humans in the womb; so cloning could be seen as a way to play God at creating life. The future for human cloning, though unsure, will continue to evoke passionate debate from both sides of the argument as more knowledge is gained.

Research Methodology

Human cloning is a controversial topic and people have varied views on the subject. The largest section of this Review of Related Literature is dedicated to the ethical viewpoints of human cloning: to understand and explain the reasons for people's viewpoints. On one side, many people seek to restrict and outright ban cloning (Fitzgerald, 1997); on the other, some people want to fully accept human cloning and use the scientific advantages cloning could bring (Kershen, 2006). This researcher believes that media outlets, including the television, newspapers, films, and books, play an important part in informing and influencing the public. Films, however, are one of the most widely seen productions of media and reach a large audience. Therefore, this researcher decided to focus on researching films to investigate what views they present on human cloning.

Null Hypothesis

Films present a neutral image of human cloning.

Alternative Hypothesis

Films do not present a neutral image of human cloning.

Population

This researcher analyzed these films, in chronological order: *Blade Runner*, *Gattaca*, *The 6th Day*, *Godsend*, and *The Island*. These films were picked from online lists of movies about cloning based on their relevance to this research (*Box office history*, 2011; *Movies that deal*, 2002). This researcher viewed these films chronologically simply as a logical method of viewing.

Definition of Key Terms

Accepting is defined as “to give admittance or approval to” (*Merriam Webster, 2011*).

Act towards is defined as “the sum of a person’s actions or effects that serve to create an impression or set an example” (*Merriam Webster, 2011*).

Contented is defined as “feeling or showing satisfaction with one’s... situation” (*Merriam Webster, 2011*).

Disapproval is defined “to pass unfavorable judgment on; to refuse approval to” (*Merriam Webster, 2011*).

This researcher defines *films* as American movies filmed between 1980 and 2008 that have a main focus of human cloning.

Frustrated is defined as “to induce feelings of discouragement in” (*Merriam Webster, 2011*).

Human cloning is defined as an attempt to create a human with the same DNA as a previous human (Sateesh, 2008).

Indeterminate is defined as “not definitely or precisely determined or fixed;... not leading to a definite end or result” (*Merriam Webster, 2011*).

Indifferent is defined as “marked by no special liking for or disliking for something” (*Merriam Webster, 2011*).

Loving is defined as “having affection or warm regard” (*Merriam Webster, 2011*).

Negative is defined as “marked by features of hostility, withdrawal, or pessimism that hinder or oppose constructive treatment or development” (*Merriam Webster, 2011*).

Neutral is defined as “not engaged on either side;... not decided or pronounced as to characteristics” (*Merriam Webster, 2011*).

Positive is defined as “marked by or indicating acceptance, approval, or affirmation” (Merriam Webster, 2011).

View is defined as “an opinion or judgment colored by feeling or bias of its holder” (Merriam Webster, 2011).

Violent is defined as “marked by extreme force or sudden intense activity;... prone to commit acts of violence” (Merriam Webster, 2011).

Quantitative Research Design

This researcher chose to use a descriptive study and created a questionnaire (Appendix A) to analyze the chosen films for their image of human cloning. By using a descriptive study, this researcher easily collected and analyzed the data to test the null hypothesis.

First, this researcher viewed and analyzed each film separately. Every Sunday afternoon starting on October 23, 2011, through November 20, 2011, this researcher watched one film. This researcher included information such as emotional state, date and time, and any other potential variables. This researcher answered the following questions about the characters in the film:

- Is (Are) the main character(s) a clone(s) or cloned from?
- Are any of the secondary characters clones or cloned from?
- How does (do) the main character(s) act about human cloning?
- How does (do) the secondary character(s) act about human cloning?
- Do the views of the main character(s) and the secondary character(s) about human cloning differ?

Then, this researcher answered the following questions about cloning technology in the film:

- What was the reason/purpose for using human cloning technology?
- Was the usage of human cloning technology supposed to have a positive, neutral, or negative impact upon mankind?
- Does the usage of human cloning technology have a positive, neutral, or negative impact?

Next, this researcher answered the following questions about the ending of the film:

- Is the ending in favor of or against human clones/cloning for mankind?
- Does the ending try to warn against human cloning for mankind?

Finally, this researcher answered the following questions about the overall image of human cloning through the film:

- What is the general image of human cloning presented by the film?
- Was there a change in the image of human cloning from the beginning of the film and the end?

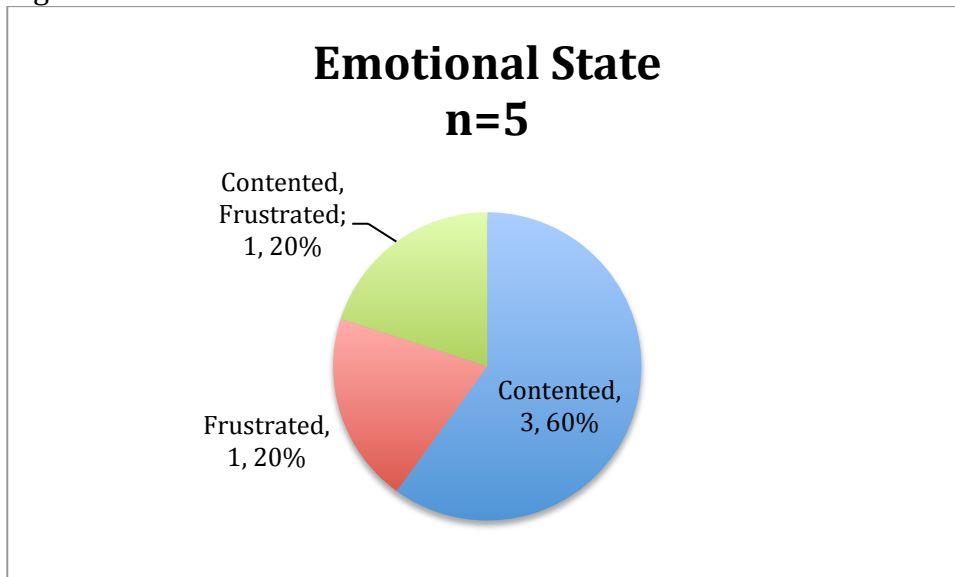
Next, this researcher compared the film questionnaires (Appendixes B-F) to each other to see if there are any similarities or statistically significant changes in views by compiling all the data into an Excel spreadsheet and graphing the results for each question and by performing statistical tests. With this information, the researcher determined if films present a neutral image of human cloning by taking the mean answer from each question.

Research Findings

Once data was collected to answer the null hypothesis, *films present a neutral image of human cloning*, this researcher began to analyze the questionnaires. The following pie charts represent the answers to the film questionnaires (Appendixes B-F). Each question's responses are represented in an individual pie chart so as to easily analyze the answers and compare and contrast results.

First, this researcher noted the emotional state she was in while viewing each film in Figure 1. The researcher kept track of her emotional state so as to see if there might be an effect on answers to the film questionnaires. During the five viewings, this researcher was content during three of the viewings, 60%, frustrated during one viewing, 20%, and both content and frustrated during one viewing, 20%.

Figure 1



Character Questions

The first five questions in the film questionnaire (Appendix A) focus on the main and secondary characters. This involves asking if the characters are clones and what their views are on human cloning.

The first question asks: *Is (Are) the main character(s) a clone(s) or cloned from?* The second question asks: *Are any of the secondary characters clones or cloned from?* As seen in Figure 2, 80% of the films had main characters that were clones or were cloned from. In Figure 3, that 80% of the five films had secondary characters that were clones or were cloned from.

Figure 2

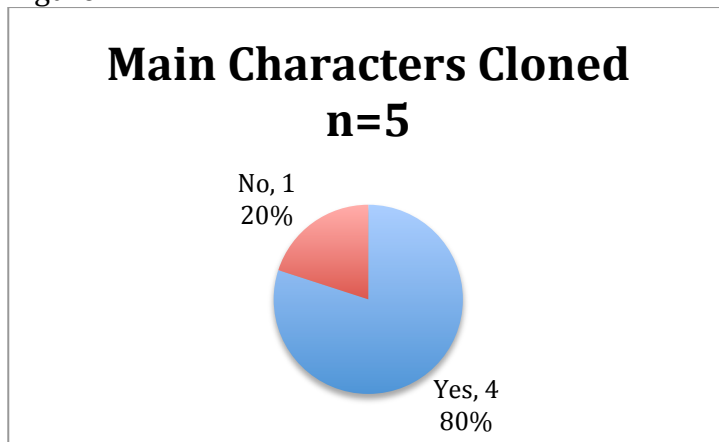
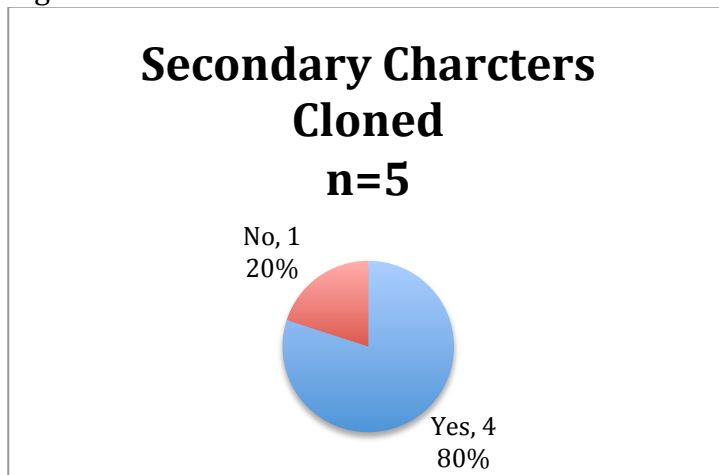
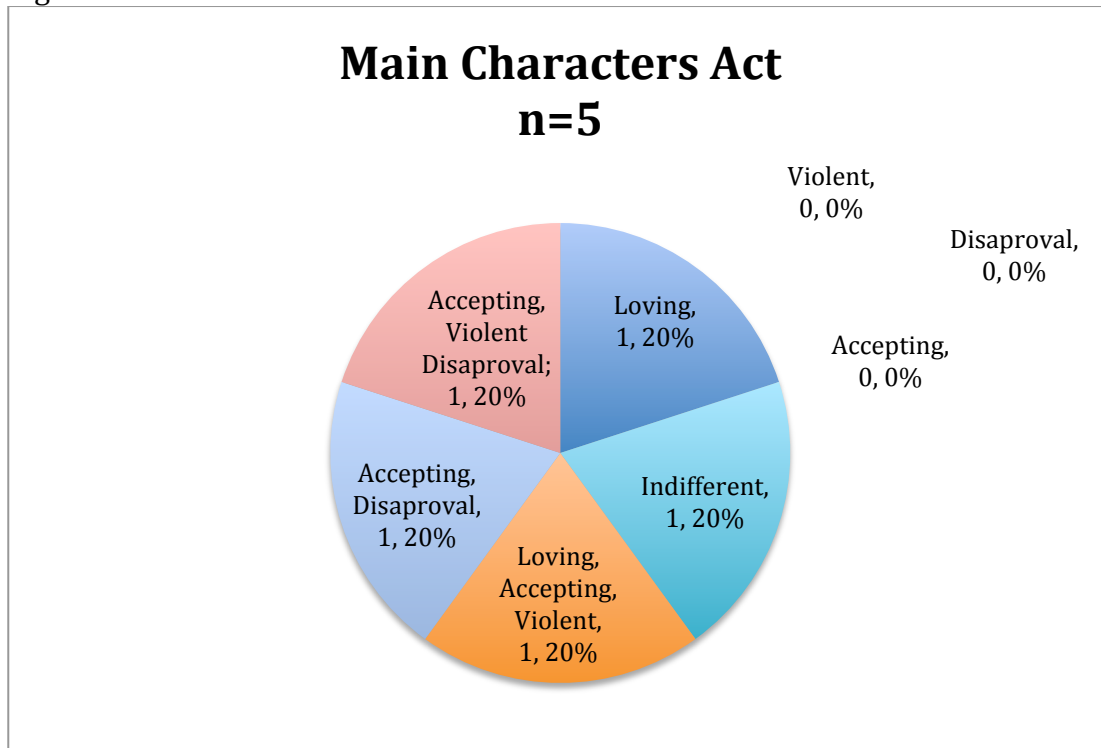


Figure 3



The next two questions ask how the main and secondary characters act regarding human cloning. Question 3 asks *How does (do) the main character(s) act about human cloning?* The answer choices were: loving, accepting, violent, disapproval, and/or indifferent. Since there were differing viewpoints within the main and secondary characters, the films portrayed different reactions to human cloning. Of the five films, as seen in Figure 4, main characters varied almost equally across all answer choices: 20% loving; 0% accepting; 0% violent; 0% disapproval; 20% indifferent; 20% accepting, violent, and disapproval; 20% accepting and disapproval; and 20% loving, accepting, and violent.

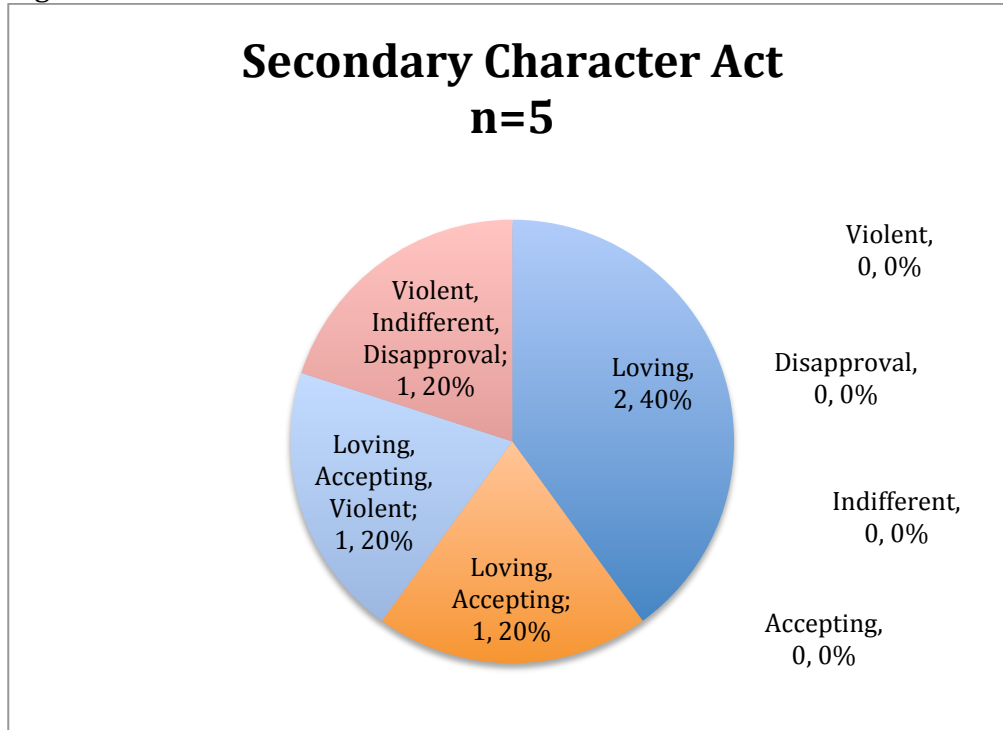
Figure 4



Question 4 asks *How does (do) the secondary character(s) act about human cloning?* As seen in Figure 5, secondary characters were varied as well but tended to view cloning positively: 40% loving; 0% accepting; 0% violent; 0% disapproval; 0% indifferent; 20%

violent, indifferent, and disapproval; 20% loving, accepting, and violent; and 20% loving and accepting.

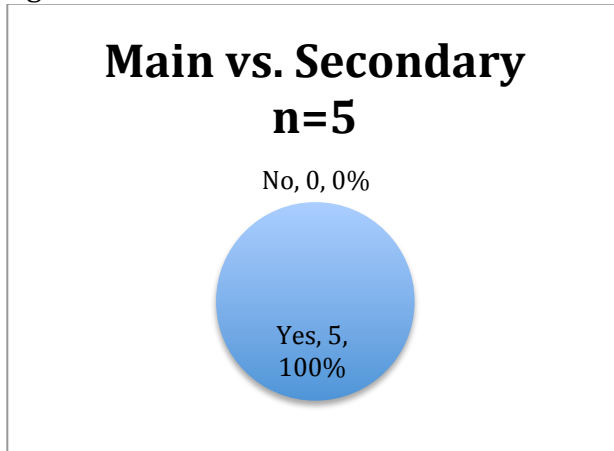
Figure 5



The fifth, and last in the character section, question compares the third and fourth answers with regards to each film, asking *Do (Does) the views of the main character(s) and the secondary character(s) about human cloning differ in regards to the above answers?*

Figure 6 on page 24 shows that the main and secondary characters differ in their views of human cloning in the five films.

Figure 6

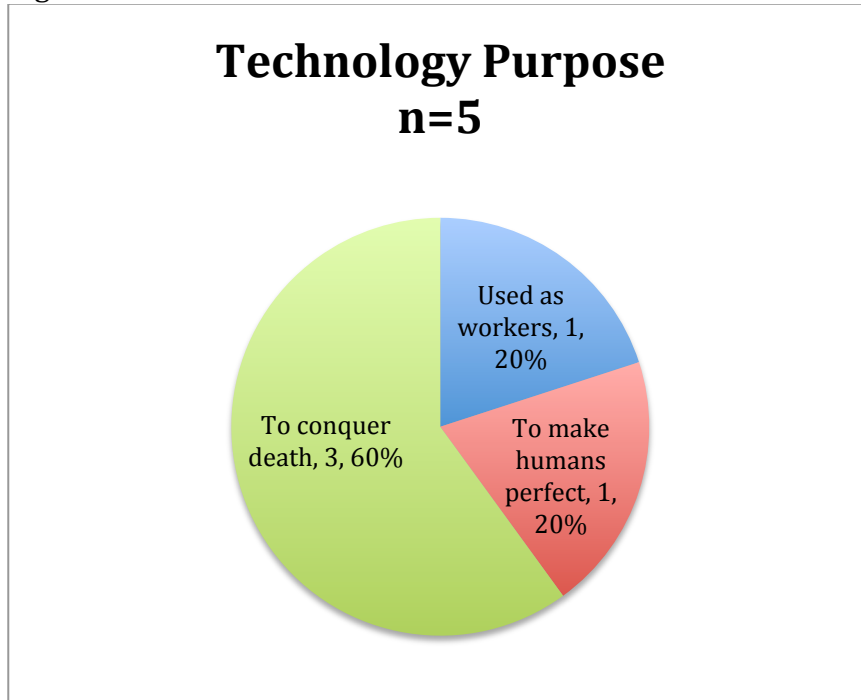


Cloning Technology Questions

The second section of the film questionnaire are the cloning technology questions. This set of questions focus on the reasoning and purpose of discovering, creating, and/or using human cloning technology, as well as the effect of using the technology.

The first question is about the reason or purpose of using human cloning technology: *What was the reason/purpose for using human cloning technology?*. The films focused on: using clones as workers, perfecting humans, and conquering death. As seen in Figure 7 on page 25, out of the five films, 20% used clones as workers, 20% attempted to perfect humans through cloning capabilities, and 60% used human cloning as a way to conquer death.

Figure 7



The second and third question asks about the impact human cloning was supposed to have and what the actual impact was on mankind. Question 2 is *Was the usage of human cloning technology supposed to have a positive, neutral, or negative impact upon mankind?* and Question 3 is *Does the usage of human cloning technology have a positive, neutral, or negative impact upon mankind?*. The answer choices were: positive, neutral, and/or negative. For the second question, as seen in Figure 8 on page 26, the usage of human cloning was supposed to be positive; all films portrayed that human cloning technology was supposed to have a positive impact on mankind. However, as seen in Figure 9 on page 26, human cloning was 0% neutral; 0% positive; 20% negative; and 80% positive and negative.

Figure 8

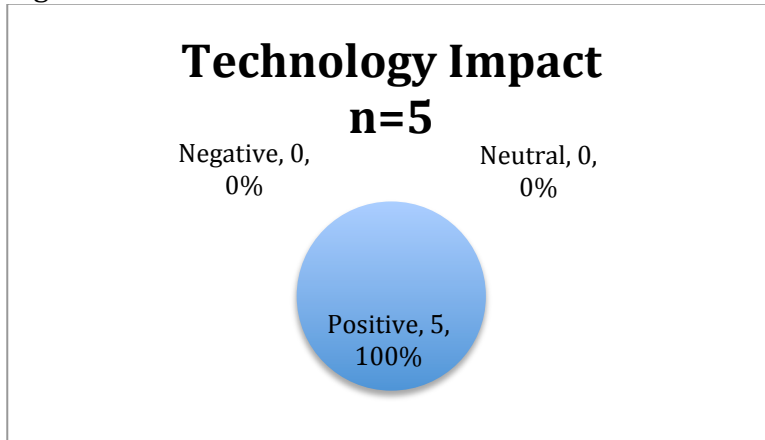
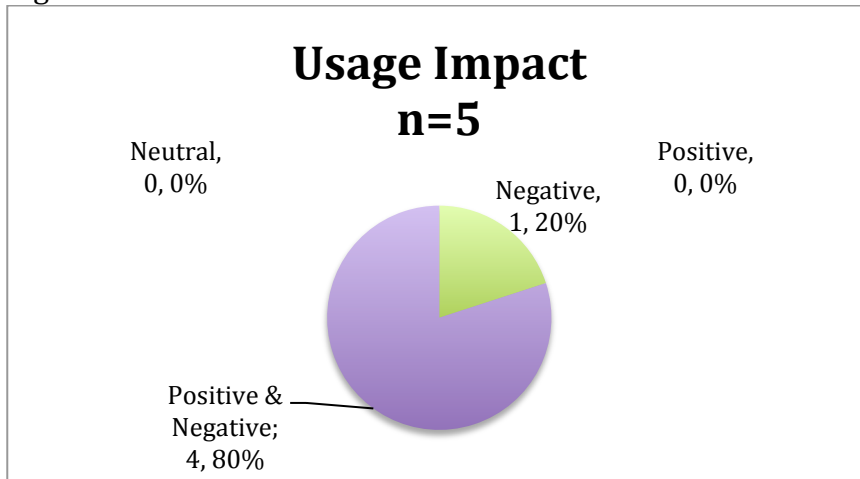


Figure 9

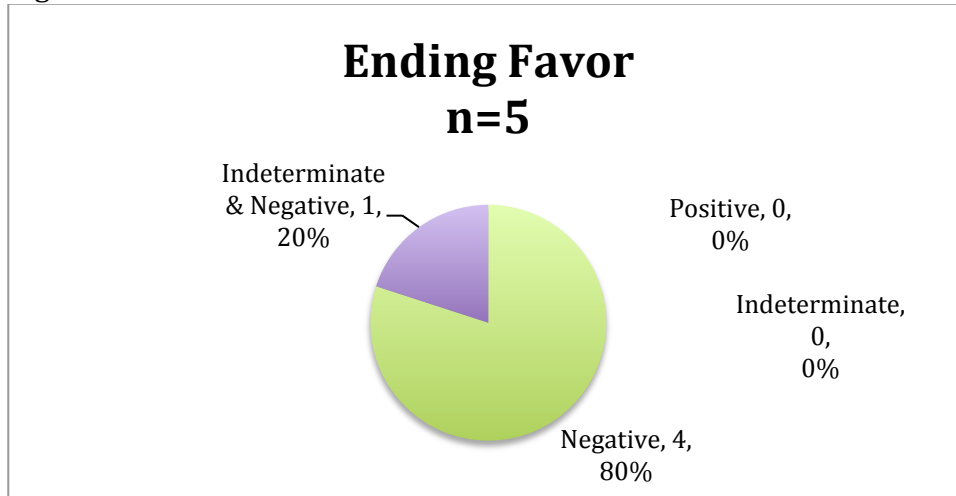


Ending of Film Questions

The ending questions examine if the ending of the film portrays human clones/cloning as positive or negative.

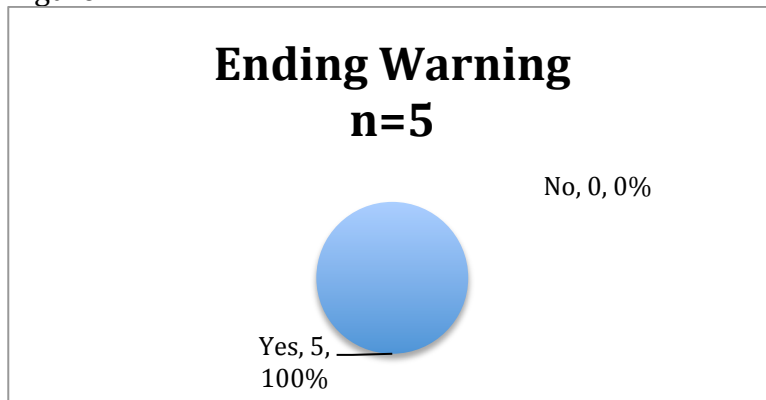
The first ending question asks *Is the ending in favor or against human clones/cloning for mankind?*. The answer choices were: positive, indeterminate, or negative. Of the film endings (Figure 10 on page 27), 0% positive; 0% indeterminate; 20% indeterminate and negative; and 80% negative.

Figure 10



The second ending question inquires *Does the ending try to warn against human cloning for mankind?* As seen in Figure 11, 100% of the films said yes and 0% no.

Figure 11

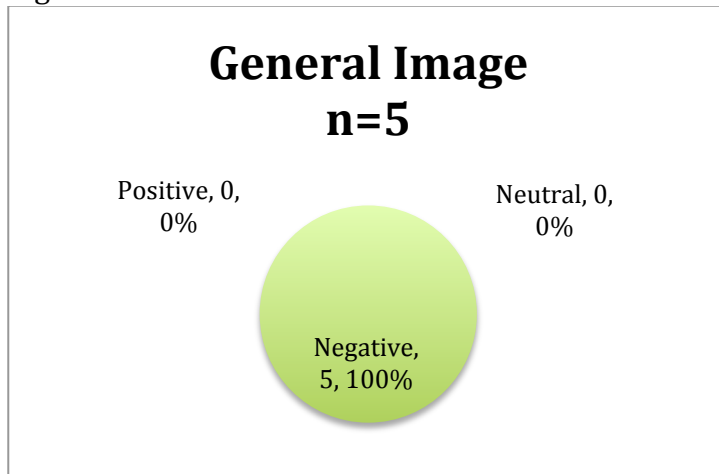


Overall Image Questions

The overall questions ask about the image of human cloning throughout the entire film.

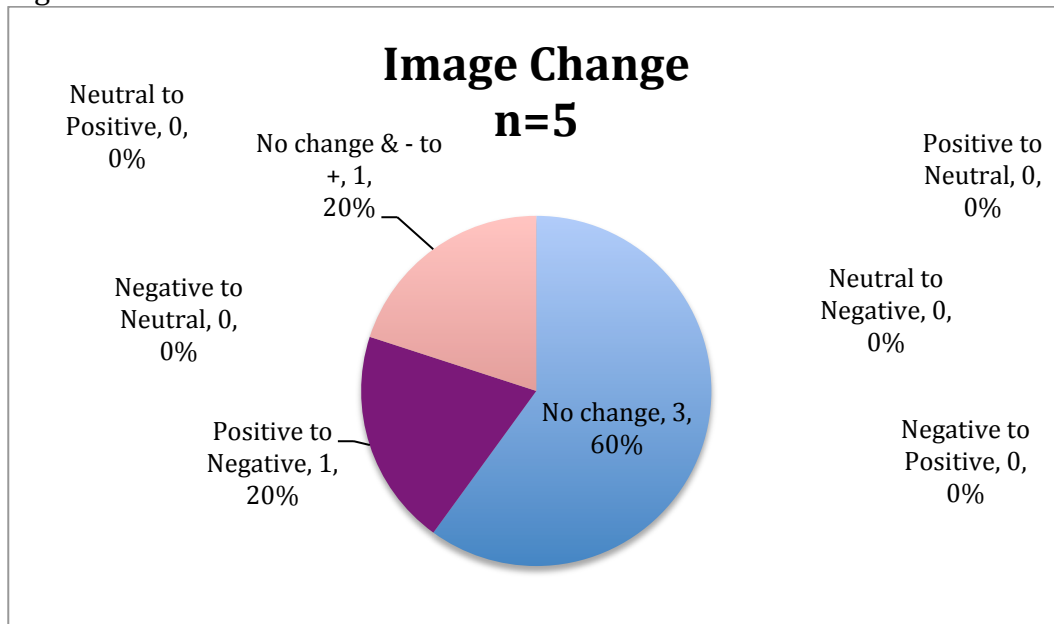
The first question asks *What is the general image of human cloning presented by the film?* The answer choices were: positive, neutral, or negative. 100% of the films portrayed a negative image of human cloning, as seen in Figure 12 on page 27.

Figure 12



The last question inquires *Was there a change in the image of human cloning from the beginning of the film and the end?* The answer choices included: no change, positive to negative, negative to positive, positive to neutral, negative to neutral, neutral to positive, and neutral to negative. Figure 13 displays that 60% of the films saw no change in the image of human cloning, while 20% had a change from positive to negative and 20% had a no change and a change from negative to positive.

Figure 13



Statistical Test

This researcher then chose question 1 out of the *Overall* section (Figure 12) to perform a 1-proportion z-test statistical test. Question 1 investigates the overall image of human cloning presented throughout the films and most clearly answered the null hypothesis: *Films present a neutral image of human cloning*. This researcher quantified the null hypothesis into $p=0.9999$, where p is the proportion of neutral viewpoints in the films. The alternative hypothesis is that $p \neq 0.9999$. However, the data from the film questionnaires revealed that there were 0 neutral films out of the 5 films tested. The researcher then conducted the 1-proportion z-test and obtained a test statistic of $z=-223.6$, giving the researcher a P-value of 0. This means that the probability of observing 0 neutral films out of 5 films if the null hypothesis were true, is 0.

Research Conclusions

Based on the film questionnaires and the statistical test, this researcher chose to reject the null hypothesis and accept the alternative hypothesis: *Films do not present a neutral image of human cloning.*

The questionnaires for the five films provided overwhelming evidence that there was not a neutral image of human cloning in films. The characters are shown to have mixed reactions to clones or human cloning, mostly negative. Cloning technology was never used for neutral purposes, which is defined on page 14. These purposes included defying death, perfecting humans, and human labor. By the end of the films, there was a negative view of attempts at human cloning and a warning against future use. Overall, there was negative image of human cloning in all five films. Examining the films individually and as a group provided strong evidence to reject the null hypothesis.

According to the 1-proportion z-test of the first question in the Overall section, *What is the general image of human cloning presented by the film?*, there was a zero probability of there being zero neutral images out of five films if the null hypothesis were correct. In the questionnaires, the answers led this researcher to believe none of the five films were neutral. Thus, there was strong evidence to reject the null hypothesis.

Taking into account both the results from the questionnaire and from the 1-proportion z-test, this researcher concluded that that *Films do not present a neutral image of human cloning.*

Recommendations for Future Research

The following are several recommendations from the researcher. She hopes that others can learn from her mistakes and not attempt research in a less empirical manner. There are sections for a continuing research study in human cloning films and for research in general.

Recommendations for further research on films' perception of human cloning.

Choose films more carefully. This researcher did not fully examine and explore the film choices picked for this study beforehand. Some of the choices did not completely fit within this study. There could have been better choices available, such as *Multiplicity* and *The Clones*.

Test the questionnaire on a different film. In order to make sure the questionnaire was ready to be used in the study, test the questionnaire on a similar film that will not be used in the official research study. This can help refine the questionnaire and make sure all the questions are necessary.

Expand definition of films. The definition the researcher used for *films* limited the possible choices; more films would have provided more data to be analyzed. By expanding the definition of films, more films could be chosen.

Start study earlier. Though this researcher attempted to start the film study as early as possible, more time should have been allowed. This way, the routine of watching each film on certain days, at certain times, could have been followed more closely.

Recommendations for further research in general.

Follow a timeline – do not get behind in the workload. Over four years of working in the Distinguished Scholars Program, this researcher has realized that working ahead,

keeping up to date with the workload, and correcting and editing immediately helps keep the research correct and up-to-date.

Take a statistics class. Understanding statistics is helpful with any research. Since this researcher did not have a basic understanding of statistics, she had difficulty understanding and using the statistics properly. By taking a statistics course, much pain and grief could be alleviated in the research process.

This researcher believes that by implementing these and other recommendations into future research both for a continuation of research for human cloning and for any research, the findings and conclusions of the research would be more accurate.

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Appendix A

Film:

Date:

Emotional State:

Film Research Questionnaire

Characters:

1. Is (Are) the main character(s) a clone(s) or cloned from?
2. Are any of the secondary character clones or cloned from?
3. How does (do) the main character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. Loving
 - b. Accepting
 - c. Violent
 - d. Indifferent
 - e. Disapproval
4. How does (do) the secondary character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. Loving
 - b. Accepting
 - c. Violent
 - d. Indifferent
 - e. Disapproval
5. Do (Does) the views of the main character(s) and the secondary character(s) about human cloning differ in regards to the above answers?

Cloning Technology:

1. What was the reason/purpose for using human cloning technology?
2. Was the usage of human cloning technology supposed to have a positive, neutral, or negative impact upon mankind? Explain and justify
 - a. Positive
 - b. Neutral
 - c. Negative
3. Does the usage of human cloning technology have a positive, neutral, or negative impact upon mankind? Explain and justify.
 - a. Positive
 - b. Neutral
 - c. Negative

Ending:

1. Is the ending in favor of or against human clones/cloning for mankind?
 - a. Positive for human clones/cloning
 - b. Negative for human clones/cloning
 - c. Indeterminate for human clones/cloning
2. Does the ending try to warn against human cloning for mankind?

Overall:

1. What is the general image of human cloning presented by the film?
 - a. Positive
 - b. Neutral
 - c. Negative
2. Was there a change in the image of human cloning from the beginning of the film and the end? Explain and justify.
 - a. No change
 - b. Positive to Negative
 - c. Negative to Positive
 - d. Positive to Neutral
 - e. Negative to Neutral
 - f. Neutral to Positive
 - g. Neutral to Negative

Other Notes:

Appendix B

Film: *Blade Runner* (1982)

Date: October 23, 2011

Emotional State: Contented

Film Research Questionnaire

Characters:

1. Is (Are) the main character(s) a clone(s) or cloned from?
 - a. No.
2. Are any of the secondary characters clones or cloned from?
 - a. Yes.
 - b. Rachel is new form of *Replicant* that had memories installed for emotional comfort and had no termination date. At the beginning she thought she was human before she found out the truth.
 - c. There are rogue NEXUS 6 *Replicants* that have escaped from an Off-world colony and come back to earth.
3. How does (do) the main character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. **Loving**
 - i. Rick Deckard, the main character, falls in love with Rachel, the next generation of *Replicant*.
 - b. **Accepting**
 - i. By the end of the film, Deckard realizes that the clones were like people, wanting to know their place in the world.
 - ii. "All he'd wanted were the same answer the rest of us want. Where did I come from? Where am I going? How long have I got?" (Deckard, *Blade Runner*)
 - c. **Violent**
 - i. Blade Runners are ordered to kill *Replicants* on-site.
 - ii. "After a bloody mutiny by a NEXUS 6 combat team in an Off-world colony, *Replicants* were declared illegal on earth – under penalty of death. Special police squads – BLADE RUNNER UNITS – had orders to shoot to kill, upon detection, any trespassing *Replicant*. This was not called execution. It was called retirement." – Introduction to *Blade Runner*
 - d. Indifferent
 - e. Disapproval

4. How does (do) the secondary character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. **Loving**
 - i. Most of the secondary characters are *Replicants* who believe they have the right to live and are perfect.
 - b. Accepting
 - c. Violent
 - d. Indifferent
 - e. Disapproval
5. Do (Does) the views of the main character(s) and the secondary character(s) about human cloning differ in regards to the above answers?
 - a. Yes.
 - b. Deckard is of the Blade Runner Unit, with orders to kill *Replicants*. Though he comes to understand *Replicants*, he still
 - c. The *Replicants* are the clones and do not want to die. They wish to be treated the same as humans, not as servants.

Cloning Technology:

1. What was the reason/purpose for using human cloning technology?
 - a. According to the beginning introduction, *Replicants*, advanced beings superior in strength and agility and equal to the intelligence of humans, were “used Off-world as slave labor, in the hazardous exploration and colonization of other planets.” (Introduction to *Blade Runner*)
 - b. *Replicants* “were designed to copy human beings in every way except their emotions. The designers reckoned that after a few years they might develop their own emotional response... hate, love, fear, anger, envy. So they built in a fail-safe device... Four-year life span.” (Bryant, *Blade Runner*)
2. Was the usage of human cloning technology supposed to have a positive, neutral, or negative impact upon mankind? Explain and justify
 - a. **Positive**
 - i. *Replicants* were supposed to have been a benefit to society, to work in dangerous areas or as servants
 - b. Neutral
 - c. Negative

3. Does the usage of human cloning technology have a positive, neutral, or negative impact upon mankind? Explain and justify.
 - a. **Positive**
 - i. At first, the *Replicants* did the jobs too dangerous or low for humans.
 - b. Neutral
 - c. **Negative**
 - i. The *Replicants* rebel against humans.

Ending:

1. Is the ending in favor of or against human clones/cloning for mankind?
 - a. Positive for human clones/cloning
 - b. **Negative for human clones/cloning**
 - i. Most of humanity still sees human clones/cloning as a positive thing for mankind.
 - ii. *Replicants* are still seen as violent rebels.
 - c. **Indeterminate for human clones/cloning**
 - i. The audience sees Deckerd's views change to accepting human clones/cloning by the end of the film but do not see if Deckerd believes human clones/cloning should continue.
2. Does the ending try to warn against human cloning for mankind?
 - a. Yes, because the human clones have rebelled and do not have a place in the world.

Overall:

1. What is the general image of human cloning presented by the film?
 - a. Positive
 - b. Neutral
 - c. **Negative**
 - i. *Replicants* were ordered to be killed on site after the rebellion.

2. Was there a change in the image of human cloning from the beginning of the film and the end? Explain and justify.

a. No change

i. For most of the world, human cloning was still seen negatively throughout the entire film.

b. Positive to Negative

c. Negative to Positive

i. Deckerd's views changed from negative to positive after meeting several *Replicants* and hearing/seeing that they were just like human beings.

d. Positive to Neutral

e. Negative to Neutral

f. Neutral to Positive

g. Neutral to Negative

Other Notes:

Setting –Los Angeles 2019, futuristic, off-world colonies, flying cars, advanced technology, etc.

Appendix C

Film: *Gattaca* (1997)

Date: October 30, 2011

Emotional State: Contented

Film Research Questionnaire

Characters:

1. Is (Are) the main character(s) a clone(s) or cloned from?
 - a. Yes.
 - b. Jerome Morrow – After a failed suicide attempt that left in a wheelchair, Jerome gives Vincent his identity.
2. Are any of the secondary characters a clone or cloned from?
 - a. Yes.
 - b. Irene – A fellow worker at Gattaca, Vincent’s love interest, has a heart condition.
 - c. Most of the world’s population.
3. How does (do) the main character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. Loving
 - b. Accepting**
 - i. Vincent has accepted this fact because this is the way the world is now.
 - c. Violent
 - d. Indifferent
 - e. Disapproval**
 - i. Vincent does not like that, because he was naturally conceived, he is discriminated against.
 - ii. This is why he cheats the system and gains a new identity.
4. How does (do) the secondary character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. Loving**
 - i. Cloned and genetically modified children are the norm now. It is better this way.
 - b. Accepting**
 - i. Cloned and genetically modified children are the norm now. It is better this way.
 - c. Violent
 - d. Indifferent
 - e. Disapproval

5. Do (Does) the views of the main character(s) and the secondary character(s) about human cloning differ in regards to the above answers?
 - a. Cloned and genetically modified children are the norm now.
 - b. Vincent and other naturally born children are discriminated against but they can only cheat the system, not change it.

Cloning Technology:

1. What was the reason/purpose for using human cloning technology?
 - a. To make human beings as perfect as possible.
2. Was the usage of human cloning technology supposed to have a positive, neutral, or negative impact upon mankind? Explain and justify
 - a. Positive**
 - i. Creating near perfect people was a chance for everyone to be happier and better.
 - ii. "You want to give your child the best possible start. Believe me, we have enough imperfection built-in already. Your child doesn't need any additional burdens. And keep in mind, this child is still you, simply the *best* of you." – Geneticist
 - b. Neutral
 - c. Negative
3. Does the usage of human cloning technology have a positive, neutral, or negative impact upon mankind? Explain and justify.
 - a. Positive**
 - i. Clones are less likely to have illnesses or imperfections, such as alcoholism, and are more capable.
 - b. Neutral
 - c. Negative**
 - i. For the invalids, there is a negative effect. They are discriminated against in all areas of life.
 - ii. "It didn't matter how much I lied on my resume, my real C.V. was in my cells. Why should anybody invest all that money to train me, when there are a thousand other applicants with a far cleaner profile? Of course, it's illegal to discriminate - "genoism" it's called - but no one takes the laws seriously." – Vincent
 - iii. "I belong to a new underclass, no longer determined by social status or color of your skin. We now have discrimination down to a science." - Vincent

Ending:

1. Is the ending in favor of or against human clones/cloning for mankind?
 - a. Positive for human clones/cloning
 - b. Negative for human clones/cloning**
 - i. Cloning and modifying children lends unfair advantages.
 - ii. Also, non-cloned, non-modified children are a new lower social class.
 - iii. Discrimination happens across the board for invalids: work, relationships, etc.
 - c. Indeterminate for human clones/cloning
2. Does the ending try to warn against human cloning for mankind?
 - a. Yes. Discrimination against invalids would occur.

Overall:

1. What is the general image of human cloning presented by the film?
 - a. Positive
 - b. Neutral
 - c. Negative**
 - i. Human cloning was too make people as perfect as possible but only created more competition in the world.
 - ii. New social classes were formed on the basis of how perfectly cloned people were.
2. Was there a change in the image of human cloning from the beginning of the film and the end? Explain and justify.
 - a. No change**
 - i. From the very beginning of the film, Vincent, an invalid, is discriminated against for being born without being cloned or modified.
 - ii. There is a negative image of human cloning throughout the films because of this discrimination.
 - b. Positive to Negative
 - c. Negative to Positive
 - d. Positive to Neutral
 - e. Negative to Neutral
 - f. Neutral to Positive
 - g. Neutral to Negative

Other Notes:

Opens with Ecclesiastes 7:13 "Consider God's handiwork: who can straighten what He hath made crooked?" and William Gaylin's "I not only think that we will tamper with Mother Nature, I think Mother wants us to."
 Setting - "The Not-to-Distant-Future"

Appendix D

Film: *The 6th Day* (2000)

Date: November 6, 2011

Emotional State: Contented, frustrated

Film Research Questionnaire

Characters:

1. Is (Are) the main character(s) a clone(s) or cloned from?
 - a. Yes.
 - b. Adam was cloned without his knowledge. Then, the film follows the clone, leading the audience to believe the clone is the original Adam.
2. Are any of the secondary characters clones or cloned from?
 - a. Yes.
 - b. Several people of high importance, social status, or wealth were cloned even though it was against the law and thought impossible.
3. How does (do) the main character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. Loving
 - b. Accepting**
 - i. By the end of the film, Adam and his clone are on friendly terms. They both accepted that clones are people too. However, Adam still does not think cloning should continue.
 - c. Violent**
 - i. Adam tried to kill his clone when he saw the clone with his family. (This was actually the clone trying to kill the real Adam)
 - d. Indifferent
 - e. Disapproval**
 - i. Adam was accidentally cloned and his clone took his place in life. (Actually, Adam went along with his life but the clone thought he was the original Adam.)

4. How does (do) the secondary character(s) act about human cloning? Select all that apply. Explain and justify.
- a. **Loving**
 - i. Several of the secondary characters are clones and the ones who developed cloning technology.
 - b. **Accepting**
 - i. Several of the secondary characters are clones and the ones who developed cloning technology.
 - c. **Violent**
 - i. Throughout the film there are riots by anti-cloning fundamentalists who do not believe any type of cloning should be allowed. These rioters turn violent, even killing some people (but they are later cloned back to life).
 - d. Indifferent
 - e. Disapproval
5. Do (Does) the views of the main character(s) and the secondary character(s) about human cloning differ in regards to the above answers?
- a. Yes.
 - b. Adam Dole does not believe cloning should happen, both at the beginning and end of the film.
 - c. Most of the known secondary characters are involved in the cloning business and are clones themselves. They obviously want to keep cloning viable and one day legal.
 - d. The anti-cloning fundamentalists want all cloning to stop.

Cloning Technology:

4. What was the reason/purpose for using human cloning technology?
- a. To “conquer death”, to not lose the geniuses and the important people.
 - b. But this leaves the question of who would decide who is cloned.
5. Was the usage of human cloning technology supposed to have a positive, neutral, or negative impact upon mankind? Explain and justify
- a. **Positive**
 - i. Cloning was designed to save lives, especially those who are of importance or wealth.
 - b. Neutral
 - c. Negative
6. Does the usage of human cloning technology have a positive, neutral, or negative impact upon mankind? Explain and justify.
- a. **Positive**
 - i. Cloning does save people.

- b. Neutral
- c. **Negative**
 - i. Michael Drucker, the head and funder of human cloning technology, controls the usage of human cloning. His power corrupts him, and he believes he will choose who will be cloned, wanting to be god.
 - ii. Cloning became a way to control people. When new clones were created, Drucker would install an ailment within the DNA so as to control the clones obedience to him.

Ending:

1. Is the ending in favor of or against human clones/cloning for mankind?
 - a. Positive for human clones/cloning
 - b. **Negative for human clones/cloning**
 - i. If cloning was continued, it would be impossible to control.
 - ii. Who would get to choose who was cloned?
 - iii. Power would corrupt, like with Drucker.
 - c. Indeterminate for human clones/cloning
2. Does the ending try to warn against human cloning for mankind?
 - a. Yes.
 - b. Even though it would help save lives, man was not made to control life and death or to play god.

Overall:

1. What is the general image of human cloning presented by the film?
 - a. Positive
 - b. Neutral
 - c. **Negative**
 - i. The power would corrupt.
2. Was there a change in the image of human cloning from the beginning of the film and the end? Explain and justify.
 - a. **No change**
 - i. The film remains negative about cloning. Even though Adam befriends his clone, he still does not believe clones should be used.
 - b. Positive to Negative
 - c. Negative to Positive
 - d. Positive to Neutral
 - e. Negative to Neutral
 - f. Neutral to Positive
 - g. Neutral to Negative

Other Notes:

Film opens with Genesis 1:27-31, "God created man in His own image, and behold, it was very good. And the evening and the morning were the sixth day." Then lists important historic events in regard to human cloning: cloning Dolly, mapping out the human genome, anti-cloning protests in Rome, human cloning experiments fail, court orders clone destroyed, sixth day laws passed, and human cloning is banned.

Cloning allowed for animals though. Human cloning happening illegally.

Setting - 2015, technology has advanced.

Appendix E

Film: *Godsend* (2004)

Date: November 13, 2011

Emotional State: Frustrated

Film Research Questionnaire

Characters:

1. Is (Are) the main character(s) a clone(s) or cloned from?
 - a. Yes.
 - b. Adam I is cloned after he dies, creating Adam II.
2. Are any of the secondary characters clones or cloned from?
 - a. No.
 - b. Jessie, Adam's mother, provides the egg and births Adam II.
3. How does (do) the main character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. Loving
 - b. Accepting
 - c. Violent
 - d. Indifferent**
 - i. Adam II does not know he is a clone or that human cloning is even possible.
 - e. Disapproval
4. How does (do) the secondary character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. Loving**
 - i. Paul and Jessie Duncan clone their son, Adam I, after he is killed in a car collision. They love Adam II, even after they learn about the tampering that was done to him.
 - ii. Dr. Richard Wells, the one who clones Adam II, tampers with the Adam's DNA, adding in his own son's DNA. He also loves Adam II, since he is partly his son as well.
 - b. Accepting
 - c. Violent
 - d. Indifferent
 - e. Disapproval

5. Do (Does) the views of the main character(s) and the secondary character(s) about human cloning differ in regards to the above answers?
 - a. Yes.
 - b. The views are different. Adam II knows nothing about cloning and therefore does not have any opinion about it. The parents are loving despite their hesitation to clone. Dr. Wells is, of course, a strong sponsor for human cloning.

Cloning Technology:

1. What was the reason/purpose for using human cloning technology?
 - a. To conquer death.
 - b. Human cloning was used to recreate Adam, Paul and Jessie's dead son.
2. Was the usage of human cloning technology supposed to have a positive, neutral, or negative impact upon mankind? Explain and justify
 - a. Positive**
 - i. Paul and Jessie had just lost their son in a car collision when Dr. Wells approached them about cloning Adam.
 - ii. Human cloning was supposed to be a way to save lives and bring back lost ones.
 - b. Neutral
 - c. Negative
3. Does the usage of human cloning technology have a positive, neutral, or negative impact upon mankind? Explain and justify.
 - a. Positive
 - b. Neutral
 - c. Negative**
 - i. Even though Paul and Jessie were able to have their child back, Adam II was combination of Adam and Zachary's DNA, which creates two identities in one body.

Ending:

1. Is the ending in favor of or against human clones/cloning for mankind?
 - a. Positive for human clones/cloning
 - b. Negative for human clones/cloning**
 - i. Cloning is illegal in the film, not even thought possible by the public.
 - ii. Adam's DNA mixed with Zachary's, Dr. Well's son, somewhat creates two identities in one body. They compete for control of the body and cause violence for themselves and for Adam's family.
 - iii. Paul points out in the film that science has gone too far and human cloning is morally wrong.
 - c. Indeterminate for human clones/cloning

2. Does the ending try to warn against human cloning for mankind?
 - a. Yes.
 - b. Cloning is still illegal and cannot be done properly.

Overall:

1. What is the general image of human cloning presented by the film?
 - a. Positive
 - b. Neutral
 - c. **Negative**
 - i. Human cloning attempts have failed, mostly because of Dr. Wells' tampering.
 - ii. Human cloning is morally wrong and against God.
2. Was there a change in the image of human cloning from the beginning of the film and the end? Explain and justify.
 - a. No change
 - b. **Positive to Negative**
 - i. For the first 8 years of Adam II's life, Jessie and Paul were happy they were able to clone Adam.
 - ii. But once they realized what Dr. Wells had done to Adam II, they realized the terrible effects and consequences of human cloning.
 - c. Negative to Positive
 - d. Positive to Neutral
 - e. Negative to Neutral
 - f. Neutral to Positive
 - g. Neutral to Negative

Other Notes:

Setting – modern day

Appendix F

Film: *The Island* (2005)

Date: November 20, 2011

Emotional State: Contented

Film Research Questionnaire

Characters:

1. Is (Are) the main character(s) a clone(s) or cloned from?
 - a. Yes.
 - b. Lincoln Six Echo
 - c. Jordan Two Delta
2. Are any of the secondary characters clones or cloned from?
 - a. Yes.
 - b. A number of people have been cloned by the wealthy.
3. How does (do) the main character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. Loving**
 - i. The two main characters are clones.
 - ii. Lincoln and Jordan become romantically involved.
 - b. Accepting
 - c. Violent
 - d. Indifferent
 - e. Disapproval
4. How does (do) the secondary character(s) act about human cloning? Select all that apply. Explain and justify.
 - a. Loving
 - b. Accepting
 - c. Violent**
 - i. Lincoln's sponsor, Tom Lincoln, threatens and hurts Lincoln because he wants his clone back in the Institute.
 - d. Indifferent**
 - i. Most clones do not realize they are clones. They are fed stories to keep them docile and controlled.
 - ii. The outside world does not know that cloning full humans with a conscious and life is possible.
 - e. Disapproval**
 - i. It is illegal to grow clones to full consciousness. They are to be kept in a vegetative state.

5. Do (Does) the views of the main character(s) and the secondary character(s) about human cloning differ in regards to the above answers?
 - a. Yes.
 - b. The two main characters are clones and do not hate themselves.
 - c. The other clones do not realize they are clones.
 - d. Tom Lincoln reacts violently when he discovers that his insurance policy has escaped.

Cloning Technology:

1. What was the reason/purpose for using human cloning technology?
 - a. To conquer death.
 - b. To use as spare parts in case of illness.
 - c. A number of people have been cloned by the wealthy as a sort of life insurance policy – if they ever need new organs or want a baby without the pain they take it from their clones.
2. Was the usage of human cloning technology supposed to have a positive, neutral, or negative impact upon mankind? Explain and justify
 - a. Positive**
 - i. Human cloning was going to be an easy way to extend and save people's lives.
 - b. Neutral
 - c. Negative
3. Does the usage of human cloning technology have a positive, neutral, or negative impact upon mankind? Explain and justify.
 - a. Positive**
 - i. Using the clones' harvested organs, many people were saved.
 - b. Neutral
 - c. Negative**
 - i. However, these clones were killed in the process.

Ending:

1. Is the ending in favor of or against human clones/cloning for mankind?
 - a. Positive for human clones/cloning
 - b. Negative for human clones/cloning**
 - i. This film shows that using human clones in this way is wrong and illegal.
 - ii. Clones should not be raised just to be used as an organ farm. They were people too.
 - c. Indeterminate for human clones/cloning

2. Does the ending try to warn against human cloning for mankind?
 - a. Yes.

Overall:

1. What is the general image of human cloning presented by the film?
 - a. Positive
 - b. Neutral
 - c. **Negative**
2. Was there a change in the image of human cloning from the beginning of the film and the end? Explain and justify.
 - a. **No change**
 - i. From the moment the film unveils that those inside the Institute were clones used only for organs and surrogate motherhood, there was a negative view on the way human cloning technology was used.
 - ii. This view continued throughout the film.
 - b. Positive to Negative
 - c. Negative to Positive
 - d. Positive to Neutral
 - e. Negative to Neutral
 - f. Neutral to Positive
 - g. Neutral to Negative

Other Notes:

Setting – July 19, 2019, high tech