The issue of designer babies

This research paper discusses designer babies and the science of creating a designer baby. It talks about in-vitro fertilization, SNPs, a success story of crating a designer baby and shows where designer babies stand in today's society. This paper also contains some evidence of ethnic beliefs on designer babies and truly how far some parents will go to get a child that they want. It emphasizes how close we are to successfully creating a one hundred percent designer baby as well as what hinders us from advancing forward. It also goes into how and why designer babies are a very controversial subject and how many parents do not want to manipulate any psychological aspect of their child, yet more are likely to manipulate physical traits. This paper talks about where society stands today about the topic of designer babies and give insight to what society will think of designer babies and if it will be the newest fashion statement in the future.

Designer Babies; the Latest Fashion Accessory

Science has advanced greatly over the last twenty years. In the past twenty years science has expanded our knowledge drastically in the medical and biological field. A great breakthrough in science is designer babies. A designer baby is when parents are able to choose the traits that their child will inherit. This includes many disease related genes as well as some characteristics, such as; sex, eye color and skin color, a child may inherit. Creating a designer baby is a simple idea but a precise and complicated process. A designer baby is created when an embryo is created through in-vitro fertilization, which is the process of taking an unfertilized egg and injecting the egg with sperm, thus fertilizing the egg outside of the body. Once this is done, the cell begins to multiply into several embryos within the

first five days, and then each embryo is removed and tested for a certain trait, such as sex. Once the desired traits are chosen the rest of the embryos that do not carry the gene or may give the desired trait less probability of showing are terminated and the remaining embryo is placed inside the mother's womb. This process is not always guaranteed but only gives one's child a higher percentage for that trait. Also, this process may need to be repeated incase there are complications with the embryo staying in the mother's womb. (Seibel, 2008) This is a very controversial issue because of its goals of creating a child with pre-selected genes.

Since they have a choice of discarding the new embryo there are many controversial issues to this process. Pro-choice activists, people who are against abortion, are against creating designer babies because the embryo is living and by their definition they would be killing a child. (Tuhus-Dubrow, 2007) Many say that they want to have their child the way they are supposed to be and that no one should be able to play as God because curiosity fuels science and science fuels greed for knowledge and cycling back into curiosity. Is it right for one to choose the traits that their child will inherit? What would happen to our society if everyone chose to create designer babies?

The process behind creating a designer baby has opened up new doors to the future of our society. If everyone chose to have this treatment done to create a designer baby to prevent disease then our future society would have no health defects. According to Meisenberg, we are very close to finding the genes capable for stroke, coronary heart disease, asthma, Alzheimer's disease, and psychosis, as well as other common diseases.

(Meisenberg, 2008) This would eliminate disease from society; our immune systems would be super human in a sense and would change dramatically. Would this be the only gain from creating designer babies? Why stop only at disease related traits? Why not chose a child that was tall, had a high IQ, and has freckles. If everyone chose their ideal traits for their child eventually there will be a split in the genome between unaltered humans and genetically altered humans. A theory that an interesting journal article, " Genetics and the Definition of 'Human'," states their thoughts on designer babies, " Human beings in the future will practice cloning and will manipulate the genomes of their offspring to the point where they will, in effect, produce a new stratum of society. These will be the 'Genrich' people, as opposed to the rest of us who are content (or stuck) with the genes we inherited by normal means...The Genrich might eventually evolve into a new species: able to mate successfully with each other but not with the [genetically] unmanipulated." (" Genetics and the Definition of 'Human'", 2010) This would have a drastic affect on those who are not designer babies. The average normal person would be at a disadvantage in society and would not be as successful in the working world. Everyone would choose the characteristics that they wanted but then the next generation would be limited to the characteristics that they would have. Eventually, everyone in our society and even the world would have the same characteristics and no one would be unique. Yes, this is bound to happen eventually but in-vitro fertilization for creating designer babies would amplify and speed up the process dramatically so that possibly our grandchildren's grandchildren will all be the same if everyone went through with creating only designer babies.

Currently, scientists can not provide these options, such as eye color, hair color, IQ etc, because there are different nucleotide polymorphisms or SNPs that codes or mark for different traits in different races. Naik finds that the only nucleotide polymorphisms that have been coded for are people of European Caucasian descent, because other ethnicities' SNPs have not been recognized yet. (Naik, 2009) Each SNP is a mark for a specific trait. There are thousands of SNPs embedded within the human genome. During in-vitro fertilization the embryo is testes for these exact markers for the desired trait, such as specific diseases. This is done in the early stages of the embryo so that when the cells continue to replicate the desired trait is present or removed depending on if the trait's goal was to be removed or not.

Many parents wish to have designer babies to help with another child who has a threatening disease. Others wish to make their child deaf because both parents are deaf and they want to share the experience. Sanghavi quotes a woman who thinks differently about defects. "'A hearing baby would be a blessing,' Ms. Duchesneau was quoted as saying. 'A deaf baby would be a special blessing.'"(Sanghavi, 2006) This event has been followed through with. The child is mostly deaf and his parents do not allow hearing aids. One may say that that is not fair to the child and it is the child's life but then that opens up another issue of parenting and ethics. Some would only choose things like eye color, hair color, possible even the sex of the child because they want the child to look like them. Any kind of manipulation of genes requires going again ones ethics to some extent, some more than others. There are many different attitudes toward creating designer babies.

There was a study at Ross University, Medical School on the Caribbean island of Dominica taken by Meisenberg that expressed different first year students' attitudes towards designer babies. This study was taken to see what the educated decisions' of the medical students were on designer babies. Meisenberg created a survey determining different attributes that could be changed and it asked the students on a scale of zero to four, zero being the lowest priority four being the highest, to rank each attribute of priority and/or wants for their own child.

Each questions pertained to one product and/or subject. Product 1: A DNA chip that tests for 5000 recessive disease-causing mutations. Product 2: A DNA chip that tests for 5000 genetic risk factors for common diseases. Product 3: A DNA chip that tests for 5000 genetic variants causing normal variation in physical traits. Product 4: A DNA chip that tests for 5000 genetic variants causing normal variation in psychological traits. Product 5: A human artificial chromosome with extra copies of tumor suppressor genes to reduce the cancer risk, and genes that extends the life span and delay age-related degenerative diseases such as Alzheimer's. The chromosome cannot be used in adults but can be injected in the fertilized egg. It can be transmitted to one's children. Product 6: The same chromosome as product 5, but for use in adults. This product cannot enter the germ line and is not transmitted to one's children. (Meisenberg, 2008)

Meisenberg's results showed that " Products 1 and 2 (prevention of single-gene disorders and polygenic diseases) were most acceptable with scores of 2. 88 and 2. 83 Products 3 and 4 got low scores of 1. 41 and 1. 66. Respectively; products 5 and 6, got somewhat lower scores of 2. 27 and 2.

35. Also, the respondents seemed no more opposed to the introduction of heritable genetic modifications (product 5) than to embryo screening (products 1 to 4) and somatic cell genetic engineering in adults (product 6). Principal components analysis showed that 56. 8 percent of the total variance was due to the unrotated first principal component, which represents a single factor of " general acceptance." (Meisenberg, 2008) Meisenberg is stating results from a poll that he has given. It seems the results lean toward mainly health related enhancements rather than physical and psychological enhancements, many of the students made decisions in hopes that their child would be widely accepted rather than genetically superior.

Our views and feelings toward manipulation of specific genes are interfered by one's ethics, thus interfering with further experimentation. Some may have chosen not to change the child's physical or psychological appearance because they do not wish to play God, but in any sense when you manipulate any gene you are playing God even if it is to eliminate disease. This then snowballs into one's personal beliefs and limits. Every parent wants what is best for their child but is manipulating their child's genetics really what's best for them? Or is it just what the parents want. These very thoughts influence scientists to testing their limits and beliefs. "'I'm not going to do designer babies…I won't sell my soul for a dollar.'" (Naik, 2009) Some scientists, as Naik has quoted, take a stand on where they will draw the line due to their beliefs of what is too far. " Trait selection in babies 'is a service,' says Dr. Steinberg. 'We intend to offer it soon.'" (Naik, 2009) Others see it as a scientific gain and it is the parents' choice to do what they want to as long

as they pay the money needed. This is still a controversial issue even between scientists.

Currently, we do not have the knowledge to single out specific traits such as eye color due to the fact that eye color is determined by multiple genes not just being dominant or recessive. The process however is fully understood and the only thing that could go wrong in the process is if there are complications with the embryo and the mother. Our knowledge of designer babies was thought to take at least twenty to fifty years to gain the knowledge we have now. It has only taken ten years into the significant progress to understand what was supposed to take twenty to fifty years; who's to say that we can not have these traits such as eye color, IQ, and personality traits within the next twenty years? The knowledge we currently have is not vast enough to single out specific traits in all ethnicities. Of the traits that are known for specific diseases, it is not guaranteed for success, there is only a high percentage that the chosen trait will be present and/or eliminated if that is the objective. There is also still a strong barrier between creating designer babies and playing God that keeps science from breaking through into full understanding of designer babies.

The price for just screening an embryo for determining its sex was $12, 400 in 2006. (Snow, 2006) The price for choosing specific traits would be drastically higher because there are so many other variables and markers to identify. In designer babies' current state it is more widely accepted for parents to want their child to be healthy and to live without any kind of disease that may run in the family but to find someone who is going through the process is extremely rare. In the future, it will be more widely accepted

and more popular that parents go through in-vitro fertilization to eliminate disease but highly frowned upon for choosing luxury traits such as psychological and physical appearance unlike today where either of the two are hard to come by. If an average family had the choice of customizing their child with today's knowledge, there would be no need to do so. The procedure would be expensive and, as some people may think of it, the child may not be who they are meant to be. This is a great variable to the success of designer babies because every parent wants their child to be who they are meant to be and to grow into their own person. Also, not many countries may allow this procedure to take place due to the advancement in technology and how it may hinder society. There will probably be more designer babies in the future but not enough to drastically hinder society due to the cost, personal beliefs and the accessibility of creating designer babies.

To make this thought from science fiction into reality we would need more advanced technology to advance our knowledge in the realm of designer babies because the technology that we have now can only take us so far. We have already done as much as we can with the technology we have today to understand and experiment with designer babies. This would mean more experiments are required to fuel the research needed to achieve the new technology and new ways of understanding the designer baby. There is no doubt that as technology advances designer babies will become the newest fashion accessories in the future. But is this what our society will allow, is this really what our society wants? There is no way to predict how the future will turn out. One can only hope that ethics with always overcome science because without ethics science would destroy society and life as we know it.