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Stem Cell Research, Therapeutic Cloning, and the Ethics of Embryo Destruction

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[Key words] embryonic stem cell research (ESCR), therapeutic cloning (TC), in vitro fertilization (IVF), abortion, ethics, anti-cloning legislation

[Abstract] This article is concerned primarily with the ethics of embryonic stem cell research (ESCR) and therapeutic cloning (TC). More specifically, it is concerned with the question of whether or not ESCR and TC ought to be prohibited or opposed out of concern for the embryos that are destroyed in these procedures. Since in vitro fertilization (IVF) also involves the destruction of human embryos, I consider the ethics of ESCR and TC in relation to the ethics of IVF. The principal question of this article is whether or not it is rational to oppose ESCR and TC while, at the same time, allowing or supporting IVF as a method to help infertile couples conceive. I argue that if pre-implantation embryos can be harmed, then IVF involves no less harm to embryos than do ESCR and TC. Furthermore, I argue that there is no justification for a discriminatory attitude

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towards these procedures: the embryos involved in IVF deserve just as much, or as little, protection as the embryos involved in ESCR and TC do. Thus, I conclude that if we oppose ESCR and TC, then we ought to oppose IVF as well, and, conversely, that if we accept IVF, then we ought to accept ESCR and TC. Since IVF is legal, publicly available, and widely accepted in countries such as the U.S. and South Korea, two of the many countries that are currently considering banning ESCR and TC, the governments of these nations ought instead to legalize these procedures make their medical and scientific benefits available to the public.

Ⅰ. Introduction

Abortion, IVF, embryonic stem-cell research (ESCR), and therapeutic cloning (TC) raise distinct, yet interrelated, ethical issues. The common thread running through the ethical issues generated by these medical or scientific procedures is that they all involve the destruction of human embryos or fetuses. What distinguishes the ethical issues raised by these procedures is the context in which the destruction occurs, where "context" is understood to include the purposes or goals that the destruction is thought to serve.

The context in which an embryo is destroyed clearly makes a difference with respect to judgments about the

ethics of such destruction. For example, while abortion is a contentious moral issue, few people deny that it is justified when the pregnancy threatens the life of the mother. Those who insist that abortion is unethical even in these circumstances will admit that aborting an embryo to save the life of the mother is at least less egregious than aborting an embryo for other, more ordinary reasons. Similarly, IVF is now far less controversial than abortion even though more embryos are destroyed per attempt at IVF than per abortion. There are at least two reasons for this discriminatory attitude towards the embryo destruction in IVF and that in abortion. One reason is that the embryos that are destroyed in IVF procedures are embryos that are not implanted in the womb, and most people seem to believe that it is less unethical to destroy an embryo before it is implanted than it is to do so afterwards. Another reason is that the primary purpose of IVF is the creation of new life rather than, as in the case of abortion, the destruction of existing life. Evidently, some people are more willing to tolerate the destruction of embryos when the destruction occurs in a context in which the overall goal is that of procreation. Indeed, they are even willing to tolerate *more* destruction than creation, since more embryos are destroyed, than are created, through IVF procedures.[1)]

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1) According to the National Center for Chronic Disease Prevention and Health Promotion in the U.S., of the 99,639 ART cycles reported in

However, while it is clear that the context does affect personal judgments about the ethics of embryo destruction, it is not so clear whether, or to what extent, it should. In general, the more contextual our ethical judgments are, the more dubious they are. Ethical reasoning, like all reasoning, is and ought to be constrained by rationality, and one of the key characteristics of rationality is consistency. So when we think through the ethics of abortion and IVF, for example, the conclusions we reach ought to be consistent with each other. Other things being equal, it is irrational, and therefore undesirable, to hold that abortion is immoral because it involves the destruction of human embryos or fetuses while at the same time allowing IVF as a method of reproduction, knowing that it too typically involves the destruction of human embryos. In order to oppose abortion while allowing IVF, one must find some important ethical difference between these two procedures.

Thus, one might hold that it is precisely because the embryos that are intentionally destroyed in IVF are not implanted in the womb that the embryo destruction in IVF is not unethical. However, if that is one's reason for supporting IVF while opposing abortion, then one should

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2000, 25,228 resulted in live-birth deliveries [www.cdc.gov, 23 May 2003]. This amounts to a success rate of about 25 percent for live births per ART cycle. On average, between 5 and 12 eggs are retrieved in a given ART cycle. Therefore, for every baby born through ART, between 19 and 47 embryos are lost or destroyed.

also presumably support ESCR and TC, since the embryos destroyed in these procedures also are not implanted in the womb. Or perhaps there is yet another important ethical difference between IVF, on the one hand, and ESCR and TC, on the other. In the absence of such a difference, it would seem that acceptance of IVF entails acceptance of ESCR and TC.

Given the constraints of consistency on ethical reasoning and the interconnectedness of the ethical issues involved in abortion, IVF, ESCR, and TC, it is inevitable that one's position on any one of these issues will influence, and be influenced by, one's position on the others. In order to develop a rational position on the ethics of any of these issues, one must develop a position that is consistent on all of them.

This article is concerned primarily with the ethics of ESCR and TC. More specifically, it is concerned with the question of whether or not ESCR and TC ought to be prohibited or opposed out of concern for the embryos that are destroyed in these procedures. However, for the reasons we have just considered, I will approach this question in relation to the embryo destruction in abortion and IVF. One of the key questions in what follows is whether or not it is rational to oppose ESCR and TC while at the same time allowing abortion or IVF. The question is important since several governments have already created, and others are in

the process of creating, policies to that effect.

Ⅱ. Relevant laws in Britain, the U.S. and South Korea

Let us begin by briefly noting the ethical policies or laws that have been framed by the governments of Britain, the U.S. and South Korea, three countries in which a significant level of stem cell research and cloning experimentation is currently being conducted.

In the area of genetics and biotechnology, Britain is clearly a world leader. The first successful birth through IVF took place in England in 1978, and was carried out by a Cambridge embryologist, Robert Edwards. In 1996, another British scientist, Ian Wilmut, was the first to successfully clone a mammal from adult body cells. Britain is also a leader in the area of cloning legislation. In January 2001, Britain became the first country to allow ESCR and the cloning of human embryos for research purposes, and shortly thereafter, in November of 2001, the British parliament passed a law that expressly prohibits human reproductive cloning (RC).

In contrast to the situation in Britain, policies on ESCR, TC, and RC in the U.S. and Korea are mired in uncertainty. In 1997, U.S. President Bill Clinton issued a

moratorium on the use of federal funds for human cloning research, and in August 2001, U.S. President George W. Bush provided further restrictions on federal funds for stem cell research. In July 2001, the U.S. House of Representatives approved a bill that prohibits the cloning of human embryos for reproductive or therapeutic purposes, but the bill needs the approval of the U.S. Senate in order to become law. In January 2002, Senator Sam Brownback introduced such a bill into the U.S. Senate, but as of November 2003 it still has not received sufficient support to be put to vote. Thus, currently there are no federal laws on ESCR, TC, or RC. Instead, American scientists struggle to work in a research environment that is hampered by the lack of federal funds and the looming prospect that ESCR and TC may be prohibited in the near future.

The situation in Korea is somewhat similar to that in the U.S. In 1999, two law-makers in the Korean National Assembly proposed a modification to the law governing research on genetic engineering, a modification that would ban, not only RC, but any cloning experiments using human cells. The modification was never passed into law, but two years later, the Ministry of Health and Welfare drafted a new ethics law on human cloning and embryo research that was intended to prohibit both RC as well as TC. This draft, which received a good deal of criticism from medical researchers and bio-engineers for being

excessively conservative, was never passed into law. In November of 2002, four years after the first law was proposed, a group of 88 law-makers disclosed a third draft designed to overcome the impasse between the Ministry of Health and Welfare and the Ministry of Science and Technology on the issues of ESCR and TC. And more recently, following the reports that a Korean women was carrying a cloned baby, a second group of 26 law-makers submitted yet another draft, similar to the one proposed in November. Despite the countless proposals that have been issued by the Ministry of Health and Welfare in the last four years, there still is no clear law on ESCR, TC, or RC in Korea. The major sticking point in the battle between the two Korean ministries has been over the proposal to restrict ESCR and prohibit TC.

With respect to abortion laws, there are also policy differences between these three countries. Under the British Abortion Act of 1967, abortion is legal within the first 24 weeks of pregnancy, but only under certain conditions. Two doctors must be satisfied that an abortion is necessary in order to protect the health of a pregnant woman or that of her existing family, or to prevent the birth of a child who would be severely handicapped. Access to abortion is then contingent upon the doctors' approval of the woman's reasons for wanting to end her pregnancy. In practice, however, access to abortion is relatively straightforward for

most women in Britain. In the U.S., the *Roe v. Wade* decision of 1973 made abortion legal within the first two trimesters of pregnancy regardless of a woman's reasons for seeking an abortion. The decision also limited the sort of restrictions that individual states could place on third-trimester abortions. In Korea, abortion is illegal according to legislation from the 1950s, although a law passed in 1986 makes legal provisions for cases of rape or incest, cases in which the pregnancy threatens the life of the mother, and cases in which the couple involved has a genetic or infectious disease. However, the existing anti-abortion law in Korea is widely regarded as a dead law, since abortion is easily available and widely practiced in Korea. Indeed, it is estimated that the abortion rate in Korea is five times higher than that in the U.S., where abortion is legal.

Finally, with respect to policies or laws on IVF, there are no important differences between these three countries. In Britain, the U.S., and South Korea, IVF is legal and available to virtually anyone who can afford it.

Ⅲ. Will anti-cloning legislation affect abortion rights?

One important question that has arisen recently in the

American debates concerning ESCR and TC is whether, or how, the current proposals to prohibit or restrict these procedures, proposals championed primarily by the Republicans, including George W. Bush, will affect abortion rights. The proposed Brownback Bill not only prohibits all forms of human cloning, but also attempts to protect human embryos from the moment of conception. Senator Brownback asserts that, "Central to the debate on embryonic stem cell research is our view of the human embryo. The central question in this debate is simple: Is the human embryo a person or piece of property? It is alive. Is it a life? If life begins at conception then we must protect this innocent human life from harm and destruction. "[2] But if the rationale for the proposed anti-cloning legislation is the idea that human embryos are worthy of protection from the moment of conception, what then will this legislation do to the abortion rights established by *Roe v. Wade*?

According to Alta Charo, a professor of law and medical ethics at the University of Wisconsin, the Brownback Bill would ultimately give more protection to cloned pre-implantation embryos than to sexually produced fetuses, and that would be incredibly powerful for those who

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2) Quoted from "Embryonic Stem Cell Research", on the website of Senator Sam Brownback, (http://brownback.senate.gov/LIBioethics.cfm, 11 May 2003).

oppose abortion. Partly for this reason, Charo doubts that the principal motive in the anti-cloning proposals is to prohibit human cloning. She asserts that, "President Bush advocates the unprecedented step of making this basic research a federal crime, not to prevent cloning, but because he needs to regain ground lost with the anti-abortion movement."[3)]

However, others disagree with the idea that the proposed legislation against ESCR and TC will affect existing abortion legislation. Douglas Johnson, legislative director for the National Right to Life Committee, claims that, "The Supreme Court decision [*Roe v. Wade*] is predicated entirely on a right that the court placed on the woman. The Brownback Bill says you can't clone a human embryo — the woman's nowhere in the picture. The cloning process occurs in the laboratory."[4)]

According to Johnson, there is a crucial difference between abortion and TC, a difference that ensures that legislation to prohibit the latter will not the affect the existing legislation that allows the former. The difference is that abortion involves the destruction of an embryo or fetus that is already gestating inside a woman. For this reason it is necessary, or at least reasonable, to consider not only the

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3) Kristen Philipkoski, "Cloning Bill Bans Abortion Too?", *Wired News*, 2003, (http://www.wired.com/news/medtech/0,1286,52838,00.html).

4) Ibid.

life of the embryo or fetus, but also the rights of the pregnant woman. Legislation that prohibited abortion would infringe, justifiably or not, upon a woman's right to privacy. However, since nuclear transfer takes place outside the womb, and since the resultant embryo is not inserted into the womb in ESCR and TC, issues of autonomy and privacy simply do not arise in those procedures. Therefore, according to Johnson's reasoning, legislation that protects the embryos produced in ESCR and TC will not affect the current legislation that permits abortion.

It is not so clear that Johnson is right about that. The *Roe v. Wade* decision was based on a particular understanding of a legal right to privacy, namely, that it ought to include a woman's decision of whether or not to terminate her pregnancy. *Roe v. Wade* certainly was not based on the idea that the embryo is a person with a right to life, a right which simply happens to be outweighed by a woman's right to privacy. The U.S. Constitution does not define a “person” as such, and the Justices who decided *Roe v. Wade* made it clear that they were not in a position to do so. While they ultimately legalized abortion on the basis of an individual's right to privacy, they did not regard this right as absolute. Rather, they thought that, as pregnancy proceeds, the health of the mother and the potential life of the fetus become significantly involved and that at some point, not prior to the end of the first

trimester, they become "compelling." However, if the U.S. Congress were now to pass legislation against ESCR and TC on the grounds that pre-implantation embryos have a right to life and deserve protection, then this would almost certainly be relevant for future legal challenges to *Roe v. Wade*.

However, even if Johnson were correct in claiming that the Brownback Bill will not affect abortion rights, it is difficult to see how or why it would not affect the legality of IVF. If the reason why the embryos produced in ESCR and TC deserve protection is that they are human entities that are produced and exist outside of the womb, then why should such protection not extend to the embryos created in IVF procedures? After all, they too are produced outside the womb. Unless there is some important difference between IVF, on the one hand, and ESCR and TC, on the other, it would seem that if the latter ought to be prohibited for the reason Johnson suggests, then the former ought to be prohibited as well.

Let us consider, then, whether there is such a difference. However, since my primary concern in this paper is with the ethics of embryo destruction, rather than with the narrower question of its legality, let us rephrase the issue as a question of ethics. The question may be put as follows: Is there any important difference between the embryo destruction in IVF, on the one hand, and that in

ESCR and TC, on the other, that justifies the idea that the former is ethically acceptable while the latter is not?

Ⅳ. Is IVF less objectionable than ESCR or TC?

One difference between these procedures that some might regard as important relates to the intentions with which they are carried out. The principal purpose of IVF is that of reproduction: the procedure aims to help infertile couples conceive. On the other hand, the primary goals of ESCR are scientific and medical: it is believed that ESCR may revolutionize the field of transplantation medicine and lead to new cures for a number of intractable illnesses. Furthermore, if such techniques or cures were developed, the possibility of transplantation procedures involving TC would become an attractive possibility in virtue of the fact that they would circumvent the rejection problems typically associated with transplantation procedures. So while the ultimate aim of IVF is to help individual couples conceive, the ultimate aims of ESCR and TC are the development of medical knowledge, techniques, and technology and the medical treatment of individual patients. In short, while the goals of IVF are reproductive, the goals of ESCR and TC are scientific and therapeutic. Of course, there are also certain commercial benefits involved in each of these

procedures, but for the purposes of this paper I will ignore these.

Does this difference in the aims or goals of these procedures justify the idea that the embryo destruction in IVF is less objectionable than the embryo destruction in ESCR and TC? It is hard to see how it could. In the first place, utilitarian considerations do not support the idea that IVF is less objectionable than ESCR and TC. While IVF helps a relatively limited number of people—in 2000, for example, approximately 25,000 American couples conceived a child through ART—ESCR has the potential to lead to cures that could help many more people. Thus, if we considered the number of people with Parkinson's disease, diabetes, heart defects, spinal cord injures, and the other conditions that researchers think might be treated through ESCR and TC, the number would be much higher than the number of people that are helped through IVF. To take just one example, according to the U.S. Food and Drug Administration, approximately 16 million Americans currently have diabetes and 800,000 news cases are diagnosed each year.[5] If we include the number of people suffering from other diseases, such as Parkinson's and Alzheimer's, the number of people who might be treated

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5) Carol Lewis, "Diabetes: A Growing Public Health Concern", on the website of the U.S. Food and Drug Administration, (http://www.fda.gov/fdac/features/2002/102_diab.html, 14 November 2003).

through ESCR and TC would be even higher. In addition, ESCR has the potential to advance scientific knowledge that could reap further therapeutic benefits in the future.

Of course, one problem with these utilitarian considerations is that they are valid only in so far as it is possible to calculate and compare different values. And does it really make sense to compare in any precise way disparate values such as reproductive freedom, health, and the advancement of medical science? Nevertheless, it is plausible to suppose that a cure for a patient with diabetes, for example, will be just as important to him or her and as the ability to conceive a child will be to an infertile couple. Accordingly, it is not unreasonable to compare the number of people that benefit from IVF with the number of people who could benefit from medical treatments based on ESCR and TC. Since the latter is likely to be substantially greater than the former, utilitarian considerations do not support the idea that the embryo destruction in IVF is less objectionable than that in ESCR and TC.

Those who insist that IVF *is* less objectionable to ESCR and TC must hold that reproductive freedom is somehow far more important than the other values at stake in this issue, values such as health and medical or scientific progress. But such an ordering of values is untenable for several reasons. In the first place, it has consequences that few would accept. If a couple's right to reproduce is so

valuable and worthy of protection that it trumps all other concerns, then what objection could there be to reproductive cloning (RC)? If one accepts the embryo destruction in IVF simply because the overall goal of IVF is reproductive, where reproductive freedom is considered far more important than other values, then one would presumably also have to accept RC. Of course, the technology associated with RC is still considered unsafe, and that is often cited as a sufficient reason for opposing its use on humans. But there are considerable risks and dangers involved in IVF as well. For example, studies using Australian data have found that children born through certain IVF procedures are twice as likely to suffer from major congenital abnormalities as are children conceived naturally.[6] In any event, if the risks involved in RC provide a legitimate reason for opposing RC, then that just demonstrates that reproductive freedom ends where significant health risks begin, and that reproductive freedom must be balanced by other values.

Secondly, in a world that is already suffering from the effects of global overpopulation, a case can be made for restrictions on the alleged right to reproductive freedom. In the 1930s, there were approximately two billion people on the planet. By the year 2015, the global population is

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6) Lori B. Adams, "We Need Regulation of Reproduction", in *Cloning: For and Against*, Open Court, Chicago, 1999, p.180.

projected to reach eight billion. Most of this population growth is taking place in the developing world, but increasing the population even in the developed world is ethically dubious, since people from these countries use a disproportionately large amount of the planet's natural resources. On the basis of these observations, Peter Singer has suggested that the problem of global overpopulation will affect the abortion debate by undermining the claim that the potential of the unborn child is a reason for bringing it into the world.[7] As a prediction, this may or may not be true, but what seems unquestionable is that the reality of global overpopulation has created a context in which reproductive freedom can no longer be considered an absolute and unassailable right. Nor does it clearly outweigh or override other important values, such as health and medical progress.

It is sometimes said that what is objectionable about ESCR and TC is that in these procedures human life is created only to be subsequently destroyed and, hence, that these procedures threaten human dignity. However, it would be a mistake to use that idea as a basis for opposing ESCR and TC while allowing IVF. In the first place, a great deal of ESCR can be conducted using left-over embryos from IVF procedures. Thus, new embryos need not be created for the purposes of ESCR. Secondly, even if

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7) Peter Singer, *Rethinking Life and Death*. St. Martin's Griffin, New York, 1994, p.98.

embryos were to be created specifically for ESCR, as they must be in the case of TC, it still would be false to say that these embryos were created *only to be subsequently destroyed*. They are created, rather, for the advancement of medical knowledge and the treatment of particular patients. What we can say is that, in these cases, human life is created *knowing that it will be destroyed*.

However, this is also true of IVF. In order to minimize the time, costs, and risks involved in IVF, most women choose to fertilize several eggs at once. Typically, two or three of the collected and fertilized eggs are implanted in the womb, with the hope that one of them will implant, but knowing that the odds that any one of them will implant are very small. The other embryos are usually frozen for future use, in case the first attempt at implantation is unsuccessful and the woman wishes to try again. For those who are successful on their first attempt, and those who are unsuccessful but do not wish to try again, the frozen embryos are eventually discarded or used for research purposes. Many such embryos are discarded each year. By one estimate, there are currently 100,000 abandoned, frozen embryos in the U.S., increasing at a rate of nearly 19,000 per year.[8] In a typical case of IVF, doctor and patient create multiple embryos, knowing that

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8) Lori B. Adams, *The Clone Age*, Henry Holt and Company, New York, 1999, p.67.

most of them will ultimately be destroyed, knowing also that the chances are high that not one of them will survive. So with respect to the questionable practice of creating embryos knowing that they will be destroyed, IVF is no less objectionable than ESCR and TC.

The idea that the embryo destruction in IVF is less objectionable than the embryo destruction in ESCR and TC is difficult to justify. Indeed, it is the opposite idea that seems most plausible—that IVF is *more* objectionable than ESCR and TC. In order to see this, let us distinguish between three sorts of embryo destruction that occur in IVF. In the first place there is the natural loss of embryos that are transferred to the uterus but fail to attach to the uterine wall. Secondly, there is the intentional discarding of embryos that are flawed or less than optimal for purposes of implantation. Thirdly, there is the intentional destruction of embryos that are frozen and never transferred to the uterus. The last two cases are clearly the most objectionable, but even the first form of embryo destruction raises ethical concerns. Typically, two or three eggs are transferred to the uterus in a given IVF cycle. Statistically, the chances that any one of them will attach to the wall of the uterus are very small (probably less than five percent). Therefore, if the embryo is a human being that deserves protection from harm, then the process of embryo transfer certainly should raise serious ethical concerns, since the

transfer procedure poses a grave risk for the embryos involved. As an analogy, one might consider the ethics of a medical procedure for adult humans that had a survival rate of less than five percent. Could any conscientious doctor or hospital ethics committee approve of such a procedure?

Nevertheless, it is the intentional destruction of embryos that most obviously raises ethical concerns. Were it not for the fact that multiple eggs are harvested and fertilized in a given IVF cycle, the intentional destruction of embryos would not, or would rarely, occur in IVF procedures. In other words, what gives rise to the ethically questionable practice of embryo destruction in IVF is the fact that multiple eggs are harvested in each cycle. But why are multiple eggs harvested? Why are women induced, with ovulation drugs, to produce more eggs than they otherwise would? The answer, of course, is that egg retrieval is a costly, time consuming, and emotionally draining procedure that poses certain health risks to the mother. In order to minimize these risks and other inconveniences, several eggs are typically harvested and fertilized in a single IVF cycle. In other words, it is for the convenience of the prospective mother—the consumer—that more embryos are created in IVF than are used, but those unused embryos are ultimately destroyed. Therefore, the intentional destruction of embryos in IVF procedures occurs for the sake of the consumer's convenience. However, the embryo destruction that takes

place in stem cell research and therapeutic cloning takes place for scientific progress, the development of medical cures, and the treatment of individual patients. In this sense, it seems that the embryo destruction in IVF is more, not less, objectionable than the embryo destruction in ESCR and TC.

Ⅴ. Conclusion

The principal question of this paper is whether or not it is rational to oppose ESCR and TC while at the same time allowing abortion or IVF. Since abortion raises issues that do not apply to the other three procedures, it is best to compare ESCR and TC to IVF, rather than to abortion. IVF is also useful in point of comparison since it is less controversial, from an ethical point of view, than abortion. Furthermore, in some of the countries that are currently considering prohibiting or restricting ESCR and TC, countries such as the U.S. and South Korea, IVF is legal and widely available. For all of these reasons, it is useful to consider whether or not it is rational to oppose ESCR or TC while allowing IVF.

Those who oppose ESCR and TC claim to do so ought of respect for the pre-implanted embryo, and indeed there appears to be no other reason for opposing these practices.

Such people assert that, whether or not the pre-implantation embryo is a human, it is at least the sort of thing that can be harmed and deserves protection. This is a questionable assertion, but in this paper I have not questioned it. The claim that I defend in this paper is the more limited claim that if pre-implantation embryos can be harmed, then IVF involves no less harm to embryos than do ESCR and TC. Furthermore, I have argued that there is no justification for our discriminatory attitudes towards these procedures: the embryos involved in IVF deserve just as much, or as little, protection as the embryos involved in ESCR and TC do. So if we oppose ESCR and TC, then we ought to oppose IVF as well. Conversely, if we accept IVF, then we ought to accept ESCR and TC It would be irrational to do otherwise.

Shall we, then, prohibit IVF in order to protect all pre-implantation embryos? There are, perhaps, reasons why we should, but there are also reasons why we should not, and even better reasons to believe that we never will. IVF is widely regarded as a miracle cure for infertile couples. It is so regarded even by those, such as George W. Bush, who has made opposition to abortion, ESCR, TC, and all forms of embryo destruction central to his political career. Indeed, Bush has gone on record as praising IVF, claiming that it is a process "which helps so many couples conceive children."[9] But this position of opposing ESCR and TC

while supporting IVF is fundamentally confused. With respect to the issue of embryo destruction, IVF is no less objectionable than ESCR and TC. Thus, since IVF will almost certainly continue to be made available to infertile couples, ESCR and TC ought to be legalized and their benefits made publicly available.

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9) See Michal Kinsley, "Bush's indecipherable position in cloning", *Washington Post Service*, December 2001.