Note

REPRODUCTIVE MISCONCEPTION: WHY CLONING IS NOT JUST ANOTHER ASSISTED REPRODUCTIVE TECHNOLOGY

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INTRODUCTION

Shortly after Dr. Ian Wilmut made international news in 1997 by announcing the successful cloning of an adult sheep,[1] Chicago physicist Dr. Richard Seed made an announcement of his own that caused similar alarm. At a law school symposium on reproduction, the Harvard-educated physicist announced plans to perfect cloning procedures and then to open a human cloning clinic for infertile couples.[2] At the time of his announcement, Dr. Seed claimed to have already compiled a team of reproductive technology experts along with four couples who were prepared to join him in his effort.[3]

Dr. Seed's controversial announcement has sparked a heated public debate over the possibility of using cloning as another reproductive technology for infertile couples.[4] Despite some of the strong

1. *See* Ian Wilmut et al., *Viable Offspring Derived From Fetal and Adult Mammalian Cells*, 385 NATURE 810, 810-11 (1997) (describing somatic cell nuclear transfer, the technical process used to create a clone of an adult sheep). It is interesting to note that in Dr. Wilmut's scientific article, the sheep affectionately known as "Dolly" is referred to simply as "6LL3." *See* George J. Annas, *Human Cloning—Should the United States Legislate Against? Yes: Individual Dignity Demands Nothing Less*, 83 A.B.A. J., 80, 80 (1997). Commentators believe that Dr. Wilmut and his research team intentionally named the sheep Dolly in an attempt to make her seem more like a pet or doll, and less like the monster in Frankenstein. *See id*.

2. *See* Rick Weiss, *Scientist Plans to Clone Humans*, WASH. POST, Jan. 7, 1998, at A4; *CNN Morning News: Scientist Plans Human Cloning Experiment* (CNN television broadcast, Jan. 7, 1998) ("It is my objective to set up a human clone clinic in greater Chicago here, make it a profitable fertility clinic, and when it is profitable, to duplicate it in 10 or 20 other locations around the country and maybe five or six international.") (Statement of Dr. Richard Seed).

3. *See* Weiss, *supra* note 2, at A4.

4. *See, e.g.*, Christine Gorman, *To Ban or Not to Ban? The Report of a Presidential Commission Sets the Stage For a National Debate on Human Cloning*, TIME, June 16, 1997, at

objections to Dr. Seed's planned clinic, there are scientists and fertility specialists who have expressed interest in the possibility that cloning could in fact be used to aid infertile couples.[5] And with the recent attention given to cloning as a potential assisted reproductive technology, Americans can anticipate an intense demand from infertile couples for the use of this technology.[6]

In their rush to promote human cloning as a great advance in human reproductive technology, the proponents of human cloning have glossed over the fundamental differences between human cloning and other currently available assisted reproductive technologies, arguing that cloning should be constitutionally protected.[7] But given

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66 (discussing the various negative public reactions to the possibility of cloning humans). On March 4, 1997, President Clinton spoke of his "deep concerns" with human cloning and issued a directive prohibiting the use of federal funds to conduct human cloning experiments. President Bill Clinton, Remarks Announcing the Prohibition of Federal Funding for Cloning for Human Beings and an Exchange with Reporters, WEEKLY COMP. PRES. DOC. 278-81 (March 4, 1997). In the same address, Clinton encouraged privately-funded researchers to voluntarily cease human cloning research. *See id.* Clinton also requested the National Bioethics Advisory Committee (NBAC) to study and make policy recommendations on human cloning. *See* Todd S. Purdum, *President Asks Experts for Advice on the New Reality of Cloning*, N.Y. TIMES, Feb. 25, 1997, at A-15. Some academics fear that widespread use of this technology may result in a diminished sense of individuality for the child. *See* Stephen A. Newman, *Human Cloning and the Family: Reflections on Cloning Existing Children*, 13 N.Y.L. SCH. J. HUM. RTS. 523, 527 (1997) (stating that "[t]ampering with such fundamental issues for the child as her developing sense of self worth, her value as an individual, and her place in the family seems wrong"). Other academics have raised concerns about the possible physical and psychological harms that a clone may face as well as the danger that cloning may devalue the quality of family life. *See* 1 NATIONAL BIOETHICS ADVISORY COMM'N, CLONING HUMAN BEINGS: REPORTS AND RECOMMENDATIONS OF THE NATIONAL BIOETHICS ADVISORY COMMISSION 61 (1997) [hereinafter NBAC REPORT].

5. *See* Sang-Hun Choe, *Panel Doubts S. Korean Team's Claim of Success in Cloning Human Embryo*, HOUS. CHRON., Jan. 29, 1999, at 21 (explaining that the Korean scientists responsible for cloning a human embryo did so to "observe how cloning techniques could be used to help infertile patients"); Steve Stephens, *Forget the Politicians and Their Objection; Give Cloning a Chance*, COLUMBIA DISPATCH, Jan. 26, 1998, at 1D (arguing that cloning represents another reproductive choice similar to in vitro fertilization); Kathleen Sullivan, *Scientists Ponder Ethics of Cloning Human Babies: See Likely Uses as Aiding Infertile Couples, Detecting Genetic Defects*, S.F. EXAMINER, Apr. 5, 1998, at C4 (quoting John Robertson as saying: "Thus it seems to me that if human cloning is ever to occur, the most plausible uses of it would be in a family setting, by couples interested in having a healthy offspring . . . .").

6. *See* Alasdir Palmer, *Shattering Reproductive Mysteries*, CHI. SUN-TIMES, Jan. 18, 1998, at 40 (predicting a high demand for cloning once the technique is perfected).

7. *See Ethics and Theology: A Continuation of the National Discussion on Human Cloning: Hearing Before the Subcomm. On Public Health and Safety of the Senate Comm. On Labor and Human Resources*, 105th Cong. 47, 47 (1997) (Statement of John A. Robertson, Co-Chair of the Ethics Committee of the American Society for Reproductive Medicine) (stating his view that human cloning should not be treated differently from other assisted reproductive technologies and arguing that cloning should not be banned); Lawrence Wu, Note, *Family Planning Through Human Cloning: Is There a Fundamental Right?* 98 COLUM. L. REV. 1461, 1461

cloning's potentially detrimental effect upon the structure of the family and the fact that cloning is qualitatively different from the assisted reproductive technologies that have gained constitutional protection, human cloning should not be treated as just another constitutionally protected assisted reproductive technology.

Part I broadly examines the use of science and technology in the procreative process by reviewing today's most common assisted reproductive technologies and by exploring the general concept of cloning, the process of somatic cell nuclear transfer, and the theoretical uses of cloning as a reproductive tool. Part II discusses two important constitutional concepts that are relevant to reproductive technologies—procreative liberty and the promotion of stable families—and examines how these concepts should be applied to human cloning. Finally, Part III argues that the fundamental differences between cloning and constitutionally protected assisted reproductive technologies place cloning outside constitutional protection, and concludes that courts should not treat cloning as just another assisted reproductive technology.

I. SEXUAL REPRODUCTION THROUGH SCIENCE AND TECHNOLOGY

In the past three decades, our society's understanding of reproduction has undergone a revolution.[8] This revolution began in the 1960s with the development of contraceptives that separated reproduction from sexual intercourse.[9] Contraceptives enabled individuals to engage in sexual activity without having to be overly concerned with the possibility of causing a pregnancy.[10] In more recent years, the second phase of this revolution has involved the development of reproductive technologies that allow reproduction without intercourse.[11]

(1998) (arguing that constitutional protection should be extended to assisted reproductive technologies).

8. *See* ROBERT H. BLANK, REGULATING REPRODUCTION 6-11 (1990) (discussing modern changes in reproductive technologies and attitudes).

9. *See* ROBERT BLANK & JANNA C. MERRICK, HUMAN REPRODUCTION, EMERGING TECHNOLOGIES, AND CONFLICTING RIGHTS 85 (1995) (discussing the birth control pill and other contraceptives).

10. *See* BLANK, *supra* note 8, at 6 (noting that sexual intercourse "could now be undertaken as an independent activity without the actuality or fear of pregnancy").

11. *See id*. at 8. This development has challenged "conventional notions of the family, parenthood, and procreative autonomy." *Id.*

The scientific advancements that have given couples the ability to reproduce without having to engage in intercourse have become increasingly complex and ever more successful in producing children for couples who would otherwise have been unable to conceive.[12] These advancements, or procedures, can be grouped generally under the heading "assisted reproductive technologies." Any procedure or method "designed to enhance fertility or to compensate for infertility"[13] can be labeled an assisted reproductive technology. The most common assisted reproductive technologies are artificial insemination, in vitro fertilization, egg donation, and surrogacy.[14]

As the number of infertile couples has grown in recent years, the demand for assisted reproductive technologies has increased.[15] A national fertility survey in 1988 revealed that 8.5% of married couples between the ages of 18 and 44 were infertile.[16] Over the past fifty years, the sperm count of American males is estimated to have dropped over 30%.[17] At the same time, the total number of women in the United States with impaired fertility has been estimated to be over 5 million.[18] It is therefore not surprising that techniques to combat infertility have developed or that the demand for their use has increased significantly. The popularity of these assisted reproductive technologies can be seen in the numbers. Between 20,000 and 30,000 children are born each year as a result of these processes,[19] and it is estimated that over 1 million couples use some form of infertility service every year.[20]

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12. *See* Valerie L. Baker, *Surrogacy: One Physician's View of the Role of Law*, 28 U.S.F. L. REV. 603, 603 (1994) (noting that the success of assisted reproductive technologies has led to an increase in demand for infertility services).

13. BLANK & MERRICK, *supra* note 9, at 85.

14. *See infra* Part II.A (discussing these four assisted reproductive technologies in greater detail).

15. *See* JOHN A. ROBERTSON, CHILDREN OF CHOICE: FREEDOM AND THE NEW REPRODUCTIVE TECHNOLOGIES 98 (1994).

16. *See id.* at 97. Infertility is defined as "the inability to reproduce after a year of regular intercourse without contraceptives." *Id.*

17. *See* BLANK, *supra* note 8, at 13.

18. *See* BLANK & MERRICK, *supra* note 9, at 85.

19. *See* John A. Robertson, *Assisted Reproductive Technology and the Family*, 47 HASTINGS L.J. 911, 911-12 (1996).

20. *See* ROBERTSON, *supra* note 15, at 98. This number is expected to increase at a rate between 10% and 16% per year. *See id.*

A. Current Assisted Reproductive Technologies

There are four major assisted reproductive technologies used today. These procedures are examined below in increasing order of complexity: (1) artificial insemination; (2) in vitro fertilization and cryopreservation; (3) egg and sperm donation; and (4) surrogate motherhood.

1. *Artificial Insemination.* Of the assisted reproductive technologies currently in use, artificial insemination is the oldest, the most popular, and the simplest.[21] People have been using artificial insemination to induce pregnancy in animals for centuries,[22] and in recent decades this procedure has become so simplified that it can be performed without the aid of a doctor or fertility specialist.[23] In short, the artificial insemination procedure involves obtaining semen from a donor, placing the semen in a syringe,[24] and then depositing the semen into the vagina, cervical canal, or uterus of a woman.[25]

2. *In Vitro Fertilization and Cryopreservation.* Though not as old as artificial insemination, in vitro fertilization (IVF) is also a well-established assisted reproductive technology.[26] Since the first child conceived through IVF was born in England in 1978, the process has gained widespread popularity.[27] IVF relies more heavily upon science

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21. *See id.* at 86; Monica Shah, *Modern Reproductive Technologies: Legal Issues Concerning Cryopreservation and Posthumous Conception*, 17 J. LEGAL MED. 547, 548-49 (1996).

22. *See* Shah, *supra* note 21, at 548.

23. *See id.* at 548-49; Elizabeth Ann Pitrolo, Comment, *The Birds, the Bees, and the Deep Freeze: Is There International Consensus in the Debate over Assisted Reproductive Technologies?*, 19 HOUS. J. INT'L L. 147, 151 (1996) (noting that some couples have achieved "do-it-yourself insemination").

24. *See* BLANK & MERRICK, *supra* note 9, at 86. Generally, the source of the sperm is immaterial in a biological sense. *See id.* However, insemination with donated sperm raises a series of ethical, physiological, and social questions because it means a third party enters the reproductive process. *See id.*

25. *See id.* This process is usually repeated over a period of several days to counteract the uncertain timing of a woman's ovulation. *See* Shah, *supra* note 21, at 549.

26. In vitro fertilization literally means "fertilization in a glass." Pitrolo, *supra* note 23, at 152. There are two variations of in vitro fertilization that have gained popularity. The first, gamete intrafallopian transfer (GIFT), calls for fertilization to take place in the woman's fallopian tubes rather than in a petri dish. *See* BLANK & MERRICK, *supra* note 9, at 87. The second variation, zygote intrafallopian transfer (ZIFT), requires an embryo to be placed in a woman's fallopian tubes approximately 18 hours after fertilization. *See id.*

27. *See* Pitrolo, *supra* note 23, at 149. In 1989, eleven years following the first successful IVF birth, figures reported at an international IVF conference revealed that approximately 15,000 IVF births had taken place worldwide. *See id.* at 149.

and laboratories than does artificial insemination. The IVF process begins by harvesting eggs from a woman.[28] A semen sample is then combined with an egg in a petri dish and placed in an incubator.[29] Once the sperm fertilizes the egg, the several pre-zygotes that develop are implanted in the female's uterus in the hope that one will eventually develop into a fetus.[30]

Another aspect of IVF, cryopreservation, has gained popularity recently.[31] Cryopreservation is the process of cooling and dehydrating an embryo to allow it to be stored for a long period of time.[32] This process has gained popularity because it allows a woman undergoing IVF procedures to use possibly all of her retrieved and fertilized eggs.[33] Cryopreservation eliminates the need to implant all of a woman's resulting embryos at once, which sometimes results in multiple pregnancies.[34] In addition, the process reduces the number of times a woman may have to undergo egg retrieval if the first IVF attemps are unsuccessful in producing a pregnancy.[35]

3. *Egg and Sperm Donation*. Since the 1980s, women who could not benefit from IVF because they were unable to produce healthy eggs on their own have been able to turn to another procedure: egg donation.[36] With egg donation, the donor goes through the same initial procedures required for IVF.[37] The eggs produced through the

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28. *See* BLANK & MERRICK, *supra* note 9, at 87; Pitrolo, *supra* note 23, at 152 n.25.

29. *See* GEOFFREY SHER ET AL., IN VITRO FERTILIZATION: THE A.R.T. OF MAKING BABIES 71-72 (1995). This process is commonly known as insemination. Fertilization, the process by which the sperm actually enters the egg, takes place a few hours after insemination. *See id.* at 72.

30. *See id.* at 75.

31. *See* Alise R. Panitch, Note, *The Davis Dilemma: How to Prevent Battles Over Frozen Preembryos*, 41 CASE W. RES. L. REV. 543, 543 (1991) (explaining that cryopreservation is a "procedure increasingly used by infertile couples to improve the odds of success of advanced reproductive technologies").

32. *See* Shah, *supra* note 21, at 550. The embryo is dehydrated and placed in liquid nitrogen where it is frozen at -196 degrees Celsius. *See id.*

33. Before cryopreservation, the only options available to women were to discard the excess eggs or to donate them to women who could not produce eggs on their own. With the development of cryopreservation, a woman now has the option of freezing her eggs for use in the future. *See* Alan Trounson, *In Vitro Fertilization and Embryo Preservation*, *in* IN VITRO FERTILIZATION AND EMBRYO TRANSFER 111, 122-23 (Alan Trounson & Carl Wood eds., 1984).

34. *See* Shah, *supra* note 21, at 550.

35. *See id.*

36. *See* BLANK & MERRICK, *supra* note 9, at 94.

37. *See id.* First, through a process known as "ovulation induction," a woman's ovaries are

IVF procedure can be donated to an infertile woman who can then have the eggs inseminated with the sperm of a fertile male.[38] For couples with an infertile male, sperm or semen donation may allow them to conceive a child using artificial insemination or IVF procedures.[39] In addition, unmarried women without male partners can use donated sperm to achieve a successful pregnancy.[40] In either case, donated sperm may be obtained from a sperm bank, fertility specialist, or even other less conventional means.[41]

4. *Surrogate Motherhood*. Finally, couples that are unable to conceive a child through any of the other assisted reproductive technologies may choose surrogacy, which is perhaps the most socially complicated and controversial assisted reproductive technology. In this process, a female surrogate becomes artificially inseminated with the sperm of a male donor.[42] In some cases, the surrogate herself provides the egg; this arrangement can be labeled "biological surrogacy."[43] In other arrangements, the surrogate can be called the "gestational surrogate" and is implanted with a fertilized egg harvested from another female donor.[44] Biological surrogacy is both a social and legal relationship where the surrogate agrees to contribute half of the genetic material, carry the fetus until full gestation, and then relinquish the child to the male donor and (usually) his female partner.[45] In gestational surrogacy, on the other hand, the surrogate mother "carr[ies] a fetus to which she typically has no biological relationship."[46]

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stimulated to produce an abnormal amount of eggs. *See* SHER ET AL., *supra* note 29, at 49. During the second process, egg retrieval, the woman's eggs are retrieved and placed in a culture to be fertilized. *See id.* at 65-66.

38. *See* ROBERTSON, *supra* note 15, at 128-29; Pitrolo, *supra* note 23, at 155 & n.39 (describing two means of in vitro fertilization for donor eggs).

39. *See* BLANK, *supra* note 8, at 26.

40. *See id.* (noting that donor insemination has been used by single women).

41. *See* ROBERTSON, *supra* note 15, at 128. Robertson suggests that forcing sperm donors to accept financial responsibility for offspring would reduce the "opportunities of unmarried women to obtain sperm from physicians or sperm banks, thus relegating them to turkey baster inseminations with sperm that has not been screened for infectious diseases." *Id.*

42. *See* BLANK & MERRICK, *supra* note 9, at 109.

43. *Id.*

44. *Id.*

45. *See id.* (distinguishing a biological surrogate from a solely gestational surrogate because a biological surrogate provides "one-half of the genetic material and therefore is, in reality, the mother").

46. *Id.* at 109-10 (describing various scenarios of gestational surrogacy including one in which the female partner of the sperm donor contributes ova and another in which a preexist-

B. Cloning and Its Potential as an Assisted Reproductive Technology

In a biological context, "cloning" may refer to a variety of processes.[47] Somatic cell nuclear transfer, the process Dr. Wilmut used to create Dolly, is the procedure that some scientists expect to use to clone humans.[48] In normal sexual reproduction, when egg and sperm cells join, they form a diploid nucleus which contains genetic information from both the egg and sperm cells.[49] "In nuclear transplantation cloning, the nucleus is removed from [the] egg and replaced with the diploid nucleus of a somatic cell,"[50] which is a fully differentiated cell that has been taken from the human body.[51] This procedure, in a sense, "fools" the egg into believing that "fertilization" has occurred.[52] In theory, this donor nucleus is then allowed to "direct" development of the egg into a viable organism, which will ultimately share the identical genetic makeup of the somatic cell donor.[53]

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ing embryo is implanted in the surrogate).

47. "Cloning" can mean the creation of a set of identical genetic material (i.e., cells or molecules). It can also mean the creation of an "identical duplicate of an organism" (i.e., Dolly). WEBSTER'S NEW WORLD DICTIONARY 263 (3d. College ed. 1988). Cloning can occur on the molecular level where deoxyribonucleic acid (DNA) is located. *See* 1 NBAC REPORT, *supra* note 4, at 14. For molecular cloning, scientists first copy the portions of DNA that contain genes. *See id.* These copies are then amplified in a host cell and used to produce a large sample of identical DNA and genes. *See id.* Secondly, scientists can also clone matter on the cellular level by extracting cells from the body of the subject and growing them in a culture in a laboratory. *See id.* The resulting cloned cells are called a cell line, and they share the genetic identity of the original cell. *See id.* However, it is important to note that neither molecular nor cellular cloning involves the use of egg or sperm cells. Therefore, the cloned cells cannot develop into an embryo or a child. *See id.* Thus, the scientific use of molecular and cellular cloning has not spawned significant controversy.

48. *See* Charlene Kalebic, *The Constitutional Question of Cloning Humans: Duplication or Procreation? An Examination of the Constitutional Right to Procreate*, 8 S. CAL. INTERDISC. L.J. 229, 231 (1998) ("Scientists agree that [somatic cell nuclear transfer], within the next few years, will be able to be used to clone humans.").

49. *See* 1 NBAC REPORT, *supra* note 4, at 15 (describing the nucleus of a somatic cell as containing sets of genes from both the mother and the father, as opposed to a germ cell nucleus which only contains one set from either the mother or the father). Egg and sperm cells each contain genetic material from the male and female respectively. *See id.* These cells are known as haploid cells. *See id.*

50. *Id.* This process differs from sexual reproduction because there is only one genetic parent—the single cell donor. *See id.*

51. *See* 1 NBAC REPORT, *supra* note 4, at 15-16.

52. *See* Greg Edwards, *The Cutting Edge of Cloning*, ROANOKE TIMES & WORLD NEWS, Feb. 25, 1997, at A1.

53. *See* Clarke D. Forsythe, *Human Cloning and the Constitution*, 32 VAL. U. L. REV. 469, 482 (1998). In actuality, the resulting clone shares a fractional amount of mitochondrial DNA from the woman contributing the egg. *See* Lori B. Andrews, *The Current and Future Legal Status of Cloning*, *in* 2 NBAC REPORT, *supra* note 4, at F-1, F-8. This, however, does not diminish the near identical genetic identity of the clone and the cell donor. *See* Stuart H. Orkin,

Before Dr. Wilmut's announcement, experiments of this type were only successful if the donor nucleus came from an early embryo before differentiation occurred.[54] Dr. Wilmut's discovery, a product of research dating back as far as the 1950s, was "stunning evidence that cell differentiation and specialization are reversible" in an *adult* cell[55] and that the process could, in fact, produce a viable organism.[56] In other words, this experiment revealed that the nuclei from adult cells, not just embryonic ones, could be used to drive development of an egg in somatic cell nuclear transfer experiments.

Although the process still has not been fully developed, scientists would use a process similar to the one Dr. Wilmut used to clone Dolly to clone a human.[57] Human somatic cell nuclear transfer would require, as a first step, obtaining a somatic cell that would serve as the source of the DNA to be cloned.[58] Next, the nucleus of the somatic cell would be transferred into an enucleated egg that had been taken from a woman.[59] In some circumstances, the female member of the cloning couple would provide the source of DNA as well as the egg necessary for the procedure.[60] In other situations, however, this procedure would allow couples to choose a "donor" to provide the DNA, the egg, or both.[61] Once the embryo was "activated," it would be placed in the woman's uterus and allowed to develop to term.[62] Ul-

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Animal Cloning and Related Embryo Research: Implications for Medicine, *in* 2 NBAC REPORT, *supra* note 4, at A-1, A-4.

54. *See* Orkin, *supra* note 53, at A-1, A-3. Differentiation is the stage at which cells become specific tissue in the body. *See* 1 NBAC Report, *supra* note 4, at 15-16.

55. *See* 1 NBAC REPORT, *supra* note 4, at 15; *see also* Wilmut et al., *supra* note 1, at 812 (describing Dolly, who was born after nuclear transfer from a mammary gland cell, as "the first mammal to develop from a cell derived from an adult tissue").

56. *See* 1 NBAC Report, *supra* note 4, at 16 ("Until this experiment many biologists believed that reactivation of the genetic material of mammalian somatic cells would not be complete enough to allow for the production of a viable adult mammal from nuclear transfer cloning.").

57. *See* John A. Robertson, *Liberty, Identity, and Human Cloning*, 76 TEX. L. REV. 1371, 1387 (1998) (describing a process scientists would use to clone humans that closely resembles the procedure Dr. Wilmut used to create Dolly).

58. *See id.*

59. *See id; see also supra* notes 50-53 and accompanying text (explaining that nuclear transplantation cloning involves the transfer of a somatic cell into an enucleated egg).

60. *See* Robertson, *supra* note 57, at 1387 n.80, 1401 (describing various cloning scenarios including one in which a mother clones herself).

61. *See id.* at 1387 n.80, 1392-97 (describing various "donor" scenarios including cloning one's children and cloning third parties).

62. *See id.* at 1387.

timately, a child born through this process would have the identical genetic makeup of the person who provided the somatic cell.[63]

In theory, this process would allow both couples and individuals who were previously unable to have children on their own to bear and raise children who share their genetic makeup. Cloning would enhance infertile couples' ability to procreate.[64] Beyond this basic application, however, cloning would also serve populations previously unable to use the current assisted reproductive technologies to produce a genetically related child. For example, if one woman agrees to provide the somatic cell, and another provides the egg, lesbian couples could use cloning as a way to conceive a child to whom they both feel a genetic parental bond. In addition, a single female—who would previously have required the participation of a sperm donor to reproduce—could produce a genetically identical child on her own by providing both the somatic cell and the egg.

Due to its technical complexity, cloning has the potential to result in thirteen different parental configurations for the clone.[65] In addition, cloning would allow couples and individuals to act upon a variety of new and unique personal procreative motivations. It is conceivable that some parents, pleased at how well one child turned out, would feel that using the child's cells to create a clone is a better option than "rolling the dice" through traditional reproductive means. In other situations, parents of a terminally ill child might want to create a clone as a way of "replacing" the child with its delayed twin.[66] Finally, it would also be possible that a husband would be so in love with his wife that he would clone her in order to have the experience of raising someone like her when she was young.[67] These scenarios are by no means exhaustive nor mutually exclusive, but they illustrate

63. *See* Forsythe, *supra* note 53, at 482.

64. *See* Kalebic, *supra* note 48, at 231 ("It has already been stated that cloning would be a boon to . . . infertile heterosexual couples who want to reproduce."); Robertson, *supra* note 57, at 1391 ("The most likely uses of cloning would enable a married couple, usually infertile, to have healthy, biologically related children for rearing.").

65. *See* Andrews, *supra* note 53, at F-56 to F-57. These different combinations are made possible due to the variety of different "contributors" to the cloning process. For example, the egg may be contributed by either the "intended mother" or a "donor." *See id.* The nucleus may be contributed by the "intended mother," "intended father," or a "donor." *See id*. The interaction of these various contributors form the various possible parental configurations.

66. *See* James Lindemann Nelson, *Cloning, Families, and the Reproduction of Persons*, 32 VAL. U. L. REV. 715, 716 (1998).

67. *See id*. at 717.

some of the new and unique motivations for reproduction that using cloning as an assisted reproductive technology might permit.

II. CURRENT ASSISTED REPRODUCTIVE TECHNOLOGIES AND THE LAW

Though it may be difficult to discern a consistent set of principles guiding legal decisions in cases involving the current assisted reproductive technologies,[68] at least two factors *have* typically been considered: the protection of procreative liberty and the promotion of a stable family environment.[69] With respect to procreative liberty, courts must consider whether the constitutional protection traditionally awarded to procreative interests should be granted to these assisted reproductive technologies.[70] When it comes to promoting a stable family environment, the court must consider how the resolution of the case will promote "core" family values[71] through the distribution of parental rights.[72] Both of these principles—that of protecting procreative liberty and that of promoting stable family environments—are significant because they serve as factors for courts to balance in resolving issues arising from the use of assisted reproductive technologies.

A. Procreative Liberty and Fundamental Rights

The United States Supreme Court has stated that procreative liberty is a fundamental right requiring heightened constitutional protection.[73] The classification of procreative liberty as a fundamental

68. *See* WILFRED J. FINEGOLD, ARTIFICIAL INSEMINATION 64-77 (2d ed. 1976); Debra Feuerberg Duffy, Note, *To Be or Not to Be: The Legal Ramifications of the Cloning of Human Embryos*, 21 RUTGERS COMPUTER & TECH. L.J. 189, 190 (1995) (noting that the American legal system is ill-prepared to deal with issues related to human cloning).

69. *See, e.g.*, In re Matter of Baby M, 537 A.2d 1227, 1253 (N.J. 1988) (discussing, within the context of surrogacy, whether the biological father's procreative rights outweigh both the procreative and custody rights of the surrogate mother).

70. *See* ROBERTSON, *supra* note 15, at 17.

71. *See* MARY ANN GLENDON, ABORTION AND DIVORCE IN WESTERN LAW *in* MARK ELLMAN ET AL., FAMILY LAW: CASES, TEXTS, PROBLEMS 3 (3d ed. 1998) (recognizing that these values center on principles surrounding marriage and kinship and arguing that some rules in family law jurisprudence have no important function other than the reaffirmation of these particular cultural values).

72. *See* BLANK, *supra* note 8, at 11 (stating that "it is crucial that ambiguities in parenthood introduced by reproductive technologies be diminished through efforts to specify what rules take precedence").

73. *See* Skinner v. Oklahoma, 316 U.S. 535, 541 (1942).

right is important because courts apply strict scrutiny to determine the constitutionality of laws that infringe upon fundamental rights.[74] The Supreme Court first recognized procreation as a basic and fundamental right in *Skinner v. Oklahoma*.[75] At issue in *Skinner* was the constitutionality of an Oklahoma statute that authorized the state attorney general to sterilize thieves after their third offense.[76] Holding the state law unconstitutional, the Court asserted that procreation is "fundamental to the very existence and survival of the race"[77] and that the statute at issue "involve[d] one of the basic civil rights of man."[78] The Court held that strict scrutiny should be applied when considering the constitutionality of a law that infringed upon this fundamental right.[79]

Over twenty years later, the Supreme Court expanded the constitutional protection for procreative liberty beyond what it had defined in *Skinner*. In *Griswold v. Connecticut*,[80] the Supreme Court upheld a married couple's right to use contraceptives.[81] The Court held that married couples enjoy a fundamental "right of privacy" in procreative decisionmaking that emanates from "penumbras" of basic rights found in the Constitution's Bill of Rights.[82] Writing in a concurrence, Justice Goldberg noted that courts must "look to the 'traditions and collective conscience of our people'" when determining what rights should be deemed fundamental.[83] Justice Goldberg further stated that the purposes behind constitutional guarantees of liberty "demonstrate that the rights to marital privacy and to marry and raise a family are of similar order and magnitude as the fundamental rights specifically protected."[84]

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74. *See* Griswold v. Connecticut, 381 U.S. 479 (1965). Under the strict scrutiny test, the Due Process Clause requires that if a right is classified as fundamental, a law burdening the right must, in order to be constitutionally protected, be narrowly tailored to further a compelling state interest. *See id*. at 497-98 (Goldberg, J., concurring).

75. 316 U.S. 535, 541 (1942) ("We are dealing here with legislation which involves one of the basic civil rights of man. Marriage and procreation are fundamental to the very existence and survival of the race.").

76. *See Skinner*, 316 U.S. at 536-37.

77. *Id.* at 541.

78. *Id.*

79. *See id.*

80. 381 U.S. 479 (1965).

81. *See id.* at 485-86.

82. *Id*. at 484-85.

83. *Id.* at 493 (quoting Snyder v. Massachusetts, 291 U.S. 97, 105 (1934) (alteration in original)).

84. *Id.* at 495.

A few years later, in *Eisenstadt v. Baird*,[85] the Court again broadened the protection of procreative activity when it granted the same privacy right in procreative decisionmaking to unmarried individuals.[86] To justify this latest extension of constitutional protection, the Court stated that "if the right of privacy means anything, it is the right of the *individual*, married or single, to be free from unwarranted governmental intrusion into matters so fundamentally affecting a person as the decision whether to bear or beget a child."[87]

In *Roe v. Wade*,[88] a case that is best known for expanding the concept of procreative liberty, the Court decided that a woman's decision to terminate a pregnancy falls within the zone of privacy protected by the Constitution.[89] But *Roe* limited the notion of procreative liberty as well as expanded it. In *Roe*, the Court recognized that the right of privacy is not an absolute right[90] and that individual procreative rights must yield to state interests when the state's interests become "compelling."[91] In the specific context of abortion, the Court acknowledged that states have an interest in protecting human life and that a state may place some regulations on the availability of abortions.[92]

Although not Supreme Court decisions, two cases have indirectly dealt with the constitutional right to procreate using nontraditional methods. The first case, *In re Matter of Baby M*,[93] was a widely publicized case that involved a surrogate mother who refused to relinquish custody of the child to the intended parents.[94] The New Jersey Supreme Court ultimately declared the surrogacy contract void as

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85. 405 U.S. 438 (1971).

86. *See id.* at 454-55.

87. *Id.* at 453. More recently, in *Casey v. Planned Parenthood*, 505 U.S. 833 (1992), Justices O'Connor, Kennedy, and Souter stated:

> Our law affords constitutional protection to personal decisions relating to marriage, procreation, contraception, family relationships, childrearing and education. . . . These matters, involving the most intimate and personal choices a person may make in a lifetime, choices central to personal dignity and autonomy, are central to the liberty protected by the Fourteenth Amendment.

Id. at 851.

88. 410 U.S. 113 (1973).

89. *See id*. at 153.

90. *See id*. at 153-54.

91. *Id.* at 154.

92. *See id.*

93. 537 A.2d 1227 (N.J. 1988).

94. *See id*. at 1236-37.

a violation of New Jersey public policy.[95] In doing so, the court slightly broadened its spectrum of fundamental rights while simultaneously providing limits on any further expansion. It stated: "The right to procreate very simply is the right to have natural children, whether through sexual intercourse or artificial insemination. It is no more than that."[96] This was a broadening in the sense that the statement explicitly recognized that an assisted reproductive technology—artificial insemination—should be included within an individual's procreative liberty rights, something that had never been done to that point. At the same time, this statement defined the outer boundaries for the expansion of procreative liberty by recognizing artificial insemination as the only assisted reproductive technology that should be constitutionally protected. In a second case, *Lifchez v. Hartigan*,[97] a federal district court held that the constitutionally protected right to make procreative decisions includes the right of an infertile couple to use certain assisted reproductive technologies.[98] The *Lifchez* court held that a law that banned fetal research—including embryo donation and embryo freezing—was unconstitutional because it infringed upon a woman's fundamental right to privacy.[99] The court essentially held that the right to make procreative decisions must include the right to use assisted reproductive technologies.[100]

Recently, the Supreme Court has moved away from expanding the boundaries of procreative liberty's protection. In *Bowers v. Hardwick*,[101] the Court upheld a law criminalizing homosexual sodomy because, according to the Court, homosexual activity had no connection with protected activities relating to marriage, family, or procreation[102] and because sodomy was not an activity "'deeply rooted in this Nation's history and tradition'" [103] or "'implicit in the

95. *See id.* at 1246.

96. *Id.* at 1253.

97. 735 F. Supp. 1361 (N.D. Ill. 1990).

98. *See id.* at 1377 ("It takes no great leap of logic to see that within the cluster of constitutionally protected choices that includes the right to have access to contraceptives, there must be included within that cluster the right to submit to a medical procedure that may bring about, rather than prevent, pregnancy.").

99. *See id.* at 1376-77.

100. *See id.* at 1377.

101. 478 U.S. 186 (1986).

102. *See id.* at 191.

103. *Id.* at 194 (quoting Moore v. East Cleveland, 431 U.S. 494, 503 (1977) (opinion of Powell, J.)).

concept of ordered liberty.'"[104] The Court in *Bowers* hinted at its reluctance to expand fundamental rights to include rights beyond those protected in earlier Supreme Court cases:

> We [are not] inclined to take a more expansive view of our authority to discover new fundamental rights imbedded in the Due Process Clause. The Court is most vulnerable . . . when it deals with judge-made constitutional law having little or no cognizable roots in the language or design of the Constitution . . . . There should be, therefore, great resistance to expand the reach of those Clauses, particularly if it requires redefining the category of rights deemed to be fundamental.[105]

Based upon the tone and content of the Court's opinion in *Bowers*, the Court may be reluctant to expand the category of fundamental rights in the future. This apparent reluctance would have major implications for those who want to treat cloning as other assisted reproductive technologies are treated. Because cloning lacks many of the elements surrounding traditional procreation that courts have considered important to date—such as marriage and the privacy that accompanies "the central life choice of having a child" and the "self expression in sexual experiences"[106]—the ability to use cloning as an assisted reproductive technology will probably not be seen as a fundamental right.

Those who consider cloning a fundamental procreative right have reached this conclusion by ignoring aspects of the procreative process that courts have traditionally considered important. They have failed to recognize what Professor John A. Robertson has termed the distinction between the "freedom to procreate," which is a protected fundamental right, and "freedom in procreation," a notion that would expand protection beyond those acts that courts have considered fundamental.[107]

As the cases discussed above illustrate, an individual's procreative rights will not be awarded primacy in all situations.[108] Individuals

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104. *Id.* (quoting Palko v. Connecticut, 302 U.S. 319, 325-26 (1937)).

105. *Id.* at 194-95.

106. Stephen A. Newman, *Human Cloning and the Substantive Due Process Riddle*, 8 S. CAL. INTERDISC. L.J. 153, 162 (1998); *cf.* Kalebic, *supra* note 48, at 252 (discussing the difference between historically protected reproductive activities and cloning).

107. John A. Robertson, *Procreative Liberty and the Control of Conception, Pregnancy, and Childbirth*, 69. VA. L. REV. 405, 410 (1983) (discussing the distinction between the "freedom *to* procreate" and "freedom *in* procreation").

108. *See* Roe v. Wade, 410 U.S. 113, 153-54 (1973).

do not have a fundamental right to procreate "by any means necessary,"[109] and their interests must yield when the state has a stronger competing interest.

B. Promotion of Core Family Values Through Distribution of Parental Rights

One such competing state interest that would warrant state regulation or even a total ban on human cloning is the interest in promoting core family values. Family relationships are important in our society as conduits through which the government promotes stable societal values.[110] The definition of "mother," "father," and "child" are legally significant because parents are assigned various rights and duties in relation to their children. Before the increased popularity of assisted reproductive technologies, "parenthood" was relatively simple to define.[111] The definition stemmed from the biological relationship between the male and female gamete providers and the resulting child.[112] In the case of adoption, individuals could resort to legal procedures to secure the status of "parent."[113]

Assisted reproductive technologies have forced our society and our courts to redefine the terms "mother" and "father."[114] For example, the use of these assisted reproductive technologies has resulted in the need for a new level of specificity in defining the term "mother." The *genetic* mother is the woman responsible for providing the egg that is ultimately fertilized.[115] The *carrying* mother is the woman whose womb is used to carry the fetus until it develops to term.[116] Finally, the *nurturing* mother is the woman who raises the child after it is born.[117] Similarly, the definition of "father" has also been expanded to include two separate definitions. The *genetic* father

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109. Bonnie Steinbock, *The NBAC Report on Cloning Human Beings: What It Did—and Did Not—Do*, 38 JURIMETRICS J. 39, 46 (1997).

110. *See* MARK ELLMAN ET AL., FAMILY LAW: CASES, TEXTS, PROBLEMS 6 (3d ed. 1998).

111. *See* BLANK, *supra* note 8, at 9.

112. *See id.*

113. *See id.*

114. *See id.* at 9-10.

115. *See id.* at 9.

116. *See id.*

117. *See id.* The woman who fulfills all three roles is referred to as the "complete mother." *Id.*

provides the sperm for fertilization while the *nurturing* father cares for the child after it is born.[118]

Because of the vast technical differences between cloning and other assisted reproductive technologies, cloning has the potential to fundamentally affect the parent-child relationship in a manner that cannot be resolved by these newly created definitions. Cloning may, in fact, "confuse[] the intergenerational structure of the family."[119] A married couple that opts to clone the wife will create the wife's delayed genetic twin.[120] In this sense, the couple would raise the wife's "sibling . . . not [her] child."[121] As one commentator notes, the "[d]efinitions of motherhood and fatherhood," including those created to address other assisted reproductive technology scenarios, are "unclear in the application to cloning."[122]

The definition of the parent-child relationship is important for a number of reasons. For one, being designated as a "parent" translates into significant constitutional protection for the parent in making decisions concerning his or her child.[123] Also, the definition of the parent-child relationship is vital to determining the statutory rights and duties of the parents.[124] Finally, the existence of a parent-child relationship is legally significant because it forms the basis for resolving custody disputes.[125]

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118. *See id.* at 10. The man who fulfills both roles is referred to as the "complete father." *Id.*

119. Newman, *supra* note 106, at 164.

120. *See id.*

121. *Id.*

122. *Id.*

123. Once a person has been designated a "parent," there is broad constitutional protection of the parent's ability to make decisions concerning the upbringing of his or her child. *See* Wisconsin v. Yoder, 406 U.S. 205, 234 (1972) (holding that "the First and Fourteenth Amendments prevent the State from compelling respondents [parents] to cause their children to attend formal high school to age 16"); Pierce v. Society of Sisters, 268 U.S. 510, 534-35 (1925) (acknowledging the parental right to enroll children in private school as a constitutionally protected decision); Meyer v. Nebraska, 262 U.S. 390, 400 (1923) (recognizing parental authority to make decisions concerning the educational upbringing of a child as constitutionally protected under the Fourteenth Amendment).

124. *See* Elizabeth Buchanan, *The Constitutional Rights of Unwed Fathers Before and After* Lehr v. Robertson, 45 OHIO ST. L.J. 313, 323 (1984) (stating that "the parent's constitutional right to be with, provide for, and control his or her child is inextricably linked to the parent's duty to provide for the child's physical and emotional needs").

125. One such example is the "biological rights doctrine," a standard courts use to resolve custody cases. *See* Toni L. Craig, Comment, *Establishing the Biological Rights Doctrine to Protect Unwed Fathers in Contested Adoptions*, 25 FLA. ST. U. L. REV. 391, 403 (1998). Under this doctrine, the biological relationship is given primacy over interests of third parties. *See id.* at 403-04. The courts presume that the child's welfare is best served under the control of a bio-

III. THE PROBLEMS OF TREATING CLONING AS JUST ANOTHER ASSISTED REPRODUCTIVE TECHNOLOGY

From the discussion, in Section I.B, of the innovative process Dr. Wilmut used to clone Dolly, it should be apparent, at least on a technical level, that somatic cell nuclear transfer differs materially from any of the currently used assisted reproductive technologies. Although the currently available assisted reproductive technologies may be "unconventional" methods of reproduction, they still require the union of an egg and sperm from two distinct persons. Cloning, on the other hand, is closer to replication or manufacturing, and it represents "a difference in kind, not in degree," in the way humans conceive children.[126] This distinction is worth remembering when considering the legal implications that would follow from treating cloning as just another assisted reproductive technology.

There are two reasons why the courts should not treat cloning in the same manner with which they have treated existing reproductive technologies. First, human cloning should not be considered a fundamental right. Here, the first consideration must be whether there is, in fact, a fundamental right to use cloning as a method of reproduction. This question must be answered in the negative because cloning represents too great of a departure from sexual reproduction and from the assisted reproductive technologies which have gained some measure of constitutional protection. The second reason why cloning should not be treated like other assisted reproductive technologies is that cloning creates unique problems that confound our society's notions of a stable family. Specifically, human cloning has the potential to blur our definitions of "mother" and "father" along with our traditional determinations of who receives parental rights.

A. Effects on Notions of Procreative Liberty and Fundamental Rights

1. *Is There a Fundamental Right to Clone?* As discussed in Section II.A, the Supreme Court has identified certain values that underlie the determination of constitutional fundamental rights. In the context of traditional sexual reproduction, which merits constitutional protection, procreation involves the following values: "privacy of intimate relationships;" "self expression in sexual

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logical parent. *See id.* at 403. Based on this presumption, in a dispute between a biological parent and a third party, courts award custody to the biological parent. *See id.* at 403-04.

126. Annas, *supra* note 1, at 80.

experience;" protection of the significant choice to bear a child and become a parent; and protection of the family decision that is essential to its social function.[127]

While a few of these values may arguably be implicated by cloning to a limited extent, other significant values clearly would not be involved were cloning used as a method of reproduction. Because of its asexual nature, human cloning does not implicate the privacy values associated with the intimacy of a sexual relationship nor does it trigger those values associated with "self-expression through human sexuality."[128] In addition, cloning is a unique method of reproduction and as such, lacks the "endorsement of tradition."[129] Indeed, "it is precisely the absence of what makes procreative experiences so valued in cloning . . . that places them outside procreative liberty's protections."[130]

Despite the lack of these fundamental elements, cloning proponents use a two-step argument to advocate that cloning be treated as a fundamental liberty. These proponents use decisions like *Baby M* and *Lifchez* to show that lower courts have begun to extend constitutional protection to certain types of assisted reproductive technologies.[131] Arguing from these cases, proponents assert that the Constitution also protects the right to "conceive" a child through cloning because the process is similar to other assisted reproductive technologies.[132]

However, the process of cloning departs too far from both traditional sexual reproduction and from the types of assisted reproductive technologies protected by the *Lifchez* and *Baby M* cases for the same constitutional protections to apply.[133] Cloning is an unprece-

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127. Newman, *supra* note 106, at 162.

128. *Id.*

129. *Id.*

130. John A. Robertson, *Liberalism and the Limits of Procreative Liberty: A Response to My Critics*, 52 WASH. & LEE L. REV. 233, 242 (1995).

131. *See supra* notes 93-100 and accompanying text.

132. John Robertson suggests that cloning is not significantly different from the assisted reproductive technologies currently in use, and that cloning may fall within the procreative freedom of infertile married couples to have biologically related offspring. *See* Robertson, *supra* note 57 at 1391-92. It is interesting to note that over twenty years ago, one commentator, Francis Pizzulli, discussed this concept, and argued that "[i]n comparison with the parent who contributes half of the sexually reproduced child's genetic formula, the clonist is conferred with more than the requisite degree of biological parenthood, since he is the sole genetic parent." Francis C. Pizzulli, Note, *Asexual Reproduction and Genetic Engineering: A Constitutional Assessment of the Technology of Cloning*, 47 S. CAL. L. REV. 476, 550 n.357 (1974).

133. *See* Lori B. Andrews, *Is There a Right to Clone? Constitutional Challenges to Bans on*

dented form of reproduction and cannot be categorized as just a variation of sexual reproduction.[134] Through sexual reproduction, each child has two biological parents and serves as a point of unity for two distinct lineages.[135] In addition, the genetic makeup of a child is ultimately "determined by a combination of nature and chance," not by human will.[136]

The current assisted reproductive technologies still result in *sexual* reproduction.[137] With these technologies, the child is genetically related to both biological parents, yet is unique in its own right.[138] Asexual reproduction is a violent departure from sexual reproduction. Cloning technology provides the opportunity for an individual to use a single source of DNA as opposed to equal amounts from two distinct "parents." In theory, the resulting child will have only one biological "parent," and that child's genetic make-up will mirror that of the DNA donor.[139] These differences illustrate that cloning is far too unique to be considered constitutionally similar to the assisted reproductive technologies that the *Lifchez* or *Baby M* courts would protect.

2. *The Child in the Procreative Process.* A frequently discussed motivation for human cloning is addressed in the "replication" scenario advanced by Professor James Nelson of the University of Tennessee.[140] According to Professor Nelson, couples may wish to clone an already existing child for a number of reasons, including to replace a deceased child or to create a child for the purposes of organ or tissue transplantation.[141] Regardless of the motivation, these scenarios show how cloning can involve children in the procreative process by using their cells to create another child. The ability to involve a child in the procreative process in this manner is a major departure from

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Human Cloning, 11 HARV. J.L. & TECH. 643, 666 (1998).

134. *See* Newman, *supra* note 106, at 163.

135. *See* Leon R. Kass, *The Wisdom of Repugnance: Why We Should Ban The Cloning of Humans*, 32 VAL. U. L. REV. 679, 690 (1998).

136. *Id.*

137. *See infra* Part.I.A.

138. *See* Kass, supra note 135, at 690.

139. *See supra* note 53 and accompanying text.

140. *See* Nelson, *supra* note 66, at 716 ("[T]he motive [for replication] is not so much a matter of a child's lineage as of its less relational properties.").

141. *See id.*

any other assisted reproductive technologies and, again, demonstrates that cloning "represents a difference in kind, not in degree."[142]

Even if cloning as an assisted reproductive technology were protected as a fundamental right, the government would be allowed to regulate this right if the statute were narrowly tailored to further a compelling state interest.[143] There have been numerous concerns raised about cloning, some of which center on the medical conditions of the cloned child,[144] the psychological well-being of the child,[145] and the effects that cloning could have on the family structure.[146] These interests are sufficiently compelling to justify state intervention in the use of cloning as a reproductive technology.[147]

As one commentator notes: "children, though generally unable to articulate, advocate, and exercise judgment about their interests, nevertheless have critical interests that deserve respect and recognition."[148] These interests generally have not included decisions about bringing new children into the family.[149] The decision to clone an already existing child "is different in kind from the ordinary decision about family size that parents exclusively control."[150] In normal sexual reproduction, both genetic parents (or gamete providers) participate in the procreative process voluntarily.[151] In the replication scenario of human cloning, however, it is the child that is being replicated or reproduced, not the parent. Another commentator has argued that parents should never be given such dominion over a child—to use a child's cells to create another viable organism, with or without the child's permission.[152] The reproductive process exists in the realm of adulthood, and a child cannot and should not be forced to "take responsibility for the act of reproduction."[153] The fundamental rights

142. Annas, *supra* note 1, at 80.

143. *See* Roe v. Wade, 410 U.S. 113, 155 (1973).

144. *See* Kalebic, *supra* note 48, at 253.

145. *See id.* at 258.

146. *See id.* at 263.

147. *See* Andrews, *supra* note 133, at 667.

148. Newman, *supra* note 4, at 525.

149. *See id.*

150. *Id.*

151. *See Scientific Discoveries in Cloning: Challenges for Public Policy: Hearing Before the Subcomm. on Public Health and Safety of the Senate Comm. on Labor and Human Resources*, 105th Cong. 43 (1997) (statement of George J. Annas, Professor and Chair, Law, Medicine, and Ethics Program Boston University School of Public Health).

152. *See id.* at 42-46.

153. Newman, *supra* note 4, at 529.

and procreative liberty cases decided thus far have involved adults and the consequences of adult procreative decisions. None of the fundamental rights cases have contemplated the participation of children in the procreative process.[154]

B. Cloning and a Stable Family Environment?

The use of the current assisted reproductive technologies has created a need to redefine traditional parental roles so that they include all of the various participants in the procreative process.[155] Along with the increase in participants comes the difficulty in determining which participants are entitled to parental rights. Assisted reproductive technology cases indicate that parental rights may be determined genetically,[156] contractually,[157] or statutorily.[158] Human cloning, however, would present parentage issues that fall outside the reach of what our courts have done thus far. Current statutes and case law are by no means comprehensive and cannot address the various parentage issues cloning raises.[159]

As an overarching consideration, cloning raises many unanswered questions concerning the legal status of clones.[160] The asexual nature of cloning raises the question of whether the offspring that results from cloning is the child or sibling of the cell donor.[161] Further, if parents, motivated by the "replication" scenario discussed above, made a clone of a dying child, would the dying child be considered

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154. *See supra* notes 80-92 and accompanying text.

155. *See infra* Part II.B.

156. *See, e.g.*, Anna J. v. Mark C., 286 Cal. Rptr. 369 (Ct. App. 1991). In this case, the court was called upon to determine the parental rights of a child born as a result of a gestational surrogacy contract. *See id.* at 370. The court, in reliance on the Uniform Parentage Act, determined that the egg donor was genetically related to the child, and thus the natural mother. *See id*. at 376.

157. *See, e.g.*, Johnson v. Calvert, 851 P.2d 776, 782 (Cal. 1993) (en banc). *Calvert* revisited the situation between Anna J. and Mark C. on appeal. *See id.* at 777-78. On appeal, the court ultimately decided in favor of the egg donor, but based its decision on the parties' contractual intent: "[S]he who intended to bring about the birth of a child that she intended to raise as her own—is the natural mother under California law." *Id.* at 782.

158. *See, e.g.*, Jhordan C. v. Mary K., 224 Cal. Rptr. 530 (Ct. App. 1986). This case involved a paternity battle between a woman and her sperm donor. *See id.* at 530. The court eventually granted the donor paternity rights because the woman failed to take the steps laid out in a statute to preclude the donor from gaining paternity rights. *See id.* at 537-38.

159. *See* Andrews, *supra* note 53, at F-42.

160. *See* Kalebic, *supra* note 48, at 268.

161. *See id.*

the parent of the resulting clone?[162] In this situation, would the dying child and his or her mother be considered the parents of the clone?[163] Beyond these unanswered questions, there are other issues that have implications for the determination of parental rights.[164] A clone may share "genetic material from as many as four individuals,"[165] and the resulting clone's parents can be defined in a variety of potentially conflicting ways—biologically, gestationally, or socially (based on intent).[166] In addition, cloning has the potential to result in thirteen different parental configurations.[167] Ultimately, cloning raises questions concerning parental rights that extend beyond the guidance provided by the assisted reproductive technology cases.

Courts cannot rely upon guidelines expressed in other assisted reproductive technology cases to determine parental rights in the context of cloning. The parentage issues that cloning raise present questions that extend beyond the ability of these cases to answer. The determination of "parent" based on genetic relation becomes confusing when there are potentially four individuals that may contribute genetic matter to one child. Additionally, the unanswered questions raised by the possibility of replicating a child make it almost impossible for courts to rely on previous assisted reproductive technology cases to determine parental rights. Because the assisted reproductive technology cases cannot provide guidance for the many novel and unique parentage issues cloning will create, courts should not treat cloning like the pre-existing reproductive technologies.

CONCLUSION

Cloning should not be considered similar to the assisted reproductive technologies that have gained constitutional protection. Cloning does not implicate the values that courts have considered important in determining which rights are fundamental, and it has the potential to involve children in the procreative process. In addition, cloning has the potential to destabilize our definitions of "mother" and "father" and to present parentage questions that go beyond what our courts would have the ability to answer. These differences are le-

162. *See id.*
163. *See id.*
164. *See* Andrews, *supra* note 53, at F-42.
165. *Id.*
166. *See id.*
167. *See supra* note 65 and accompanying text.

gally significant, and they are the reasons why human cloning should not be constitutionally protected as if it were just another assisted reproductive technology.