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ABSTRACT

There are countless issues stemming recent advancements in the field of reproductive technology. This article focuses specifically on redefining “birth” to appropriately reflect how external fetal gestation will inevitably impact the future of both maternity and paternity leave in the United States and provides recommendations on how to rectify the currently ambiguous federal legislation.

Introduction

This Articles concentrates on the interaction between and intersection of primarily three distinct concepts: (1) previous, current, and future developments and advancements in reproductive technology; (2) employment law in the context of federal paid and unpaid maternity and paternity leave under 29 U.S.C.A. §2612 of the Family and Medical Leave Act of 1993 (FMLA); and (3) prospective implications of a modernized, progressive construction of family. A description, explanation, and speculative prediction of a pending Massachusetts maternity leave case provides the legal backdrop for properly framing this Article’s recurrent conceptual tripartite theme mentioned above. Despite the apparent potential for moral, ethical, religious, 

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1 Kara Krill v. Cubist Pharmaceuticals, Inc. and Caroline Chevalier (US Dist. of Mass.) “Complaint and Demand for Jury Trial” filed August 26, 2011 [hereinafter Complaint].

2 Lewis Vaughn, DOING ETHICS: MORAL REASONING AND CONTEMPORARY ISSUES 161-225 (2nd ed. 2010).

societal, environmental, sexual, or other personal objections to the use and implementation of reproductive technology, specifically, to the eventual creation of streamlined artificial wombs, its undeniable development cannot and should not be ignored. By implementing the previously mentioned analytical framework, this Article elucidates and theorizes about the artificial womb’s subsequent impact on how federal maternity and paternity leave, whether paid or unpaid, will operate in a society in which our notion of the family structure is

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7 Olsen & Pellisier, supra note 5 (explaining some feminist views that are against pregnancy altogether because it causes women to suffer though “nausea, vomiting, weight gain of up to [over] 40[] pounds, fatigue and pain, with a torturous pushing culmination that can leave the mother dead, wounded with a c-section, with pelvic floor injuries, postpartum hemorrhage, pre-eclampsia, hospital infections, or post-traumatic stress disorder”); See generally Lois N. Magner, Women and the Scientific Idiom: Textual Episodes from Wollstonecraft, Fuller, Gilman, and Firestone, Vol. 4, No. 1, WOMEN, SCIENCE, AND SOCIETY 61, 77-80. (Autumn, 1978).
8 See e.g., Midhat Farooqi, A scientific compromise: Ectogenesis may satisfy a long debate, THE BATTALION ONLINE, available at http://www.thebatt.com/2.8482/a-scientific-compromise-1.1215517#.TsiCrM01P_w (explaining how ectogenesis is the only possible reconciliation between pro-life supporters and pro-choice supporters, as ectogenesis could be used to not only save fetuses that were previously on their way to abortion, but would still provide women with the right to remove unwanted cells from their body); See generally Xiaochen Sun, Come to Daddy: How the Legal Landscape of Abortion Will Be Changed by Artificial Wombs (Spring 2010) (unpublished RUTGERS COMPUTER & TECH. L.J. Student Note, Rutgers School of Law – Newark).
9 Knight, supra note 3 (stating how the potential ramifications and risks of permitting such advancements in reproductive technology cannot be overstated).
constantly evolving. Afterwards, this Article suggests effective methods to alter the applicable legislation’s usage of the term “birth,” as the statutory text currently fails to define exactly what “birth” is. This lack of definitional specificity ultimately provides the catalyst for a troublesome situation in the future of parental leave during a time of eventual artificial womb utilization. Finally, this Article concludes with a comparison between sentiments of parental leave in the United States and more accepting, tolerant ones expressed throughout European countries.

I. The Springboard for an Analysis of the Current Federal Parental Leave Legislation

Forty-one-year-old mother Ms. Kara Krill (“Krill”) brought suit in the United States District Court for the District of Massachusetts on August 26, 2011 against her former employer, Cubist Pharmaceuticals, Inc. (“Cubist”), for refusing to provide Krill with certain fringe employment benefits, including “thirteen weeks of paid maternity leave for the birth and care of a child.” These employment benefits were originally stipulated in Krill’s employment contract with Cubist. Krill has suffered from Asherman’s syndrome since the birth of her first child in June 2007. According to Krill’s complaint, Asherman’s syndrome is a “reproductive disability that

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10 See Note, Looking for a Family Resemblance: The Limits of the Functional Approach to the Legal Definition of Family, 104 Harv. L. Rev. 1640 (1991) (“The traditional nuclear family is rapidly becoming an American anachronism.”).
11 See infra Section IV.
12 See infra Section VI.
13 Complaint, supra note 1, at 10. Krill also filed a “Charge of Discrimination” with both the Massachusetts Commission Against Discrimination (NCAD) and the United States Equal Employment Opportunity Commission (EEOC).
14 Robinson, supra note 4.
15 Complaint, supra note 1, at 2-3.
17 See generally Charles M. March, Management of Asherman’s Syndrome, REPRODUCTIVE BIO MEDICINE ONLINE (July 2011) 23(1), 63, 63-76 (explaining epidemiology, pathology, causes, symptoms, and management, prevention, and comprehensive therapy techniques commonly used to treat patients with Asherman’s disease).
substantially and prematurely limits . . . [a woman’s] ability to carry a child to birth.”18 Women who suffer from this disability typically experience menstrual aberrations, infertility, recurrent pregnancy loss, intrauterine growth restriction, errors of placental implantation and other complications associated with pregnancy.19 As a result of her disability causing reproductive limitations, Krill and her husband opted to employ the services of a gestational surrogate to give birth to their biological child.20 However, although the two originally planned for the birth of just one child, in September 2010, the couple learned, much to their surprise, that their surrogate was actually pregnant with twins.21 The couple, in order to substantiate that the twins carried by their surrogate were in fact biologically theirs, jointly obtained a Pre-Birth Order from a Pennsylvania judge.22 Although employers in Massachusetts “are not required to provide paid maternity leave,”23 Krill’s written employment contract with Cubist provided four varieties of paid leave for the birth and care of

19 See generally March, supra note 17.
21 Complaint, supra note 1, at 3. See generally Johnson v. Calvert, 851 P.2d 776, 778 (Cal. 1993) (affirming the California Court of Appeals’ decision which held that a husband and wife who implemented the services of a gestational surrogate mother were in fact still the “genetic, biological[,] natural” and legal parents of the child born from the fertilized egg that had been previously implanted within the surrogate mother). The Johnson court explained that such surrogacy contracts do not “offend the state or federal Constitution or public policy.” Id. at 778.
23 Id.; See M.G.L.A. 149 § 105D (describing female employees’ entitlement to various rights and benefits).
a child. However, the precise issue to be litigated in this pending case focuses on the disparity between two particular internal Cubist employment policies. This specific conflict stems from the difference between the thirteen weeks of paid maternity leave sought by Krill under Cubist’s “Maternity Leave Policy,” intended for “female employees . . . for the birth of a child,” and the mere five days of paid maternity leave sought by Cubist under its “Adoption Leave Policy” intended for “employees . . . for the adoption of a child.” In other words, each party is arguing for Krill’s current predicament to fall within a different policy category described in Cubist’s written employment contract. Thus, the Massachusetts District Court will face the difficult task of pigeonholing Krill’s scenario into one of Cubist’s employment policies, neither of which seem to directly or appropriately identify her and her husband’s method of begetting children. Although Krill’s complaint alleges various claims for relief, including violations of M.G.L.A. ch. 151B, §§ 4 (1), (4), (4A), (5), (16), several

24 Complaint, supra note 1, at 3-4.
25 Id.
26 See also Complaint, supra note 1, at 2-3 (describing Cubist’s “paternity leave policy,” which provides male employees with five days of paid leave for the birth of a child).
27 See generally Eisenstadt v. Baird, 405 U.S. 438, 453-455 (1972) (holding that there is a constitutional right to “beget” a child).
28 Stating, in relevant part, that it is unlawful “[f]or an employer, by himself or his agent, because of the . . . sex . . . of any individual to . . . discriminate against such individual in compensation or in terms, conditions or privileges of employment, unless based upon a bona fide occupational qualification.” See Complaint, supra note 1, at 11-12.
29 Stating, in relevant part, that it is unlawful “[f]or any person, employer, labor organization or employment agency to discharge, expel, or otherwise discriminate against any person because he has opposed any practices forbidden under [Chapter 151B].” See Complaint, supra note 1, at 12.
30 Stating, in relevant part, that it is unlawful “[f]or any person to coerce, intimidate, threaten, or interfere with another person in the exercise of enjoyment of any right granted or protected [under Chapter 151B].” See Complaint, supra note 1, at 13.
31 Stating, in relevant part, that it is unlawful “[f]or any person, whether an employer or an employee or not, to aid, abet, incite, compel or coerce the doing of any of the acts forbidden
federal discrimination violations including 42 U.S.C. §§ 12112, 2000e-2(a)(1), and 2000e-3(a), which focus primarily on Krill’s reproductive disability and sex, breach of contract, breach of implied covenant of good faith and fair dealing, promissory estoppel, and negligent misrepresentation. The penultimate issue of this dispute focuses on determining the underlying purposes of federal parental leave itself. As may already seem apparent, Krill will set forth an argument that will at least in part support the idea that maternity leave is 

under [Chapter 151B] or to attempt to do so.” See Complaint, supra note 1, at 13-14.

Stating, in relevant part, that it is unlawful for any employer, personally or through an agent, to 
perform the essential functions of the position involved with reasonable accommodation, unless the employer can demonstrate that the accommodation required to be made to the physical or mental limitations of the person would impose an undue hardship to the employer’s business.

See Complaint, supra note 1, at 10-11.

Stating, in relevant part, that it is unlawful for an employer to “discriminate against a qualified individual on the basis of disability in regard to job application procedures, the hiring, advancement, or discharge of employees, employee compensation, job training, and other terms, conditions, and privileges of employment.” See Complaint, supra note 1, at 14.

Stating, in relevant part, that it is unlawful for an employer to “[d]iscriminate against any individual with respect to . . . compensation, terms, conditions, or privileges of employment, because of such individual’s . . . sex.” The statute uses the term “because of sex” to include “pregnancy, childbirth, or related medical conditions; and women affected by pregnancy, childbirth, or related medical conditions.” See Complaint, supra note 1, at 15.

Stating, in relevant part, that it is unlawful “for an employer to discriminate against any of his employees or applicants for employment . . . because [s]he has opposed any practice made an unlawful employment practice by this subchapter.” See Complaint, supra note 1, at 16.

Stating, in relevant part, that it is unlawful “for an employer to discriminate against any of his employees or applicants for employment . . . because [s]he has opposed any practice made an unlawful employment practice by this subchapter.” See Complaint, supra note 1, at 17-19.

The ultimate question being which party, Krill or Cubist, will prevail in this case.
designed not only as a means to provide mothers with a respite for recovery due to the intense physical and biological stresses and hardships associated with actual childbirth, but also to allocate sufficient time for mother-child bonding to take place. Conversely, Cubist will at least in part argue that maternity leave, to the extent that it is to be paid in accordance with its employment policies, ought to be reserved exclusively for mothers who physically endure a natural childbirth, and not merely distributed to any woman who becomes a mother through other technological means. This argument, if successful, would support Cubist’s current internal employment policies, thus justifying treatment of Krill as if she had adopted a child, rather than actually giving birth to one. Viewing this specific issue from a more broad, speculative context lays the groundwork for the quintessential question, one in which this Article primarily focuses on: how will employment law, specifically the statutory construction of federal parental leave set forth in 29 U.S.C.A. §2612, be affected by the advancements in reproductive technology that will inevitably allow prospective parents to utilize external or artificial wombs to essentially “grow” children?

II. Background of Ectogenesis and the Developing Field of Fetal Molecular Biology

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38 Olsen & Pellisier, supra note 7.
39 Infra Section V. (a).
40 Diane E. Eyer, Mother-infant bonding: A scientific fiction, HUMAN NATURE, Vol. 5, Number 1, 69-94 (hypothesizing that the longstanding ideology of the necessity for mother-infant bonding was actually promulgated for a variety of politically useful reasons, and is ultimately unwarranted and undeserved of such acceptance and preeminence); See also Lindsay Cross, It Doesn’t Matter How You Have a Baby, You Deserve Maternity Leave, THE GRINDSTONE, http://thegrindstone.com/career-management/it-doesnt-matter-how-you-have-a-baby-you-deserve-maternity-leave-357/ (exclaiming that many legal experts believe the outcome will depend on plaintiff Krill’s employment contract with Cubist).
41 ALODUS HUXLEY, BRAVE NEW WORLD, PG. 6,15 (1932) (setting forth a rather novel and futuristic idea of babies “growing” in test tubes).
42 “Ectogenesis,” a term coined by British Scientist J.B.S. Haldane in 1924, describes how human pregnancy would eventually lead to the development of artificial wombs; See also Frida Simonstein, Artificial Reproduction Technologies (RTs)-- All the Way to the Artificial Womb?, 9 MED. HEALTH CARE & PHIL. 359, 359 (2006); See generally Jessica H. Schultz, a1, Development of
The terms “ectogenesis” and “artificial womb” are inextricably related, as “ectogenesis” refers generally to “the process of the embryo or fetus developing in the device outside the body,” while “artificial womb” applies more specifically as “the actual device that holds the embryo or fetus.” The possibilities and potential issues arising from the development of artificial wombs are seemingly endless, ranging from the supremely necessary to the supremely selfish. Although utilization of an artificial womb could eventually preserve the life of a premature baby, it could also be used to simply allow women to merely circumvent the hardships commonly associated with pregnancy, which include weight gain, stretch marks, or potential postpartum depression. Regardless of the underlying reasons of the eventual usage of such technology, the


Schultz, supra note 40, n. 5; See also Irina Aristarkhova, Ectogenesis and Mother as Machine, 3 Body & Soc’y 43 (2005).

Olsen & Hank Pellisier, supra note 5 (listing numerous benefits resulting from the utilization of artificial wombs, including maternal and fetal health and safety, female careers no longer hindered by pregnancy, balanced parental roles, opportunity for males to have babies, genetic therapy, and sexual freedom).


See Hyun Jee Son, Artificial Wombs, Frozen Embryos, and Abortion: Reconciling Viability’s Doctrinal Ambiguity, 14 UCLA WOMEN’S L.J. 213 (providing an in-depth explanation of the necessary and drastic change to the current viability standard for abortion, as articulated in Planned Parenthood v. Casey, 505 U.S. 833 (1992), upon this reproductive technology’s fruition). Under Son’s theory, the state could make abortion virtually impossible, as reproductive technology would allow an embryo to gestate externally, obviating the usual criticism received by pro-life proponents about banning abortion altogether; See also Walter Block & Roy Whitehead, Compromising the Uncompromisable: A Private Property Rights Approach to Resolving the Abortion Controversy, 4 APPALACHIAN J.L. 1 (2005).

Ectogenesis – Panacea or Ethical Nightmare? KURO5HIN (Oct. 01, 2003), http://www.kuro5hin.org/story/2003/10/1/124441/622.

Christine Rosen, Why Not Artificial Wombs?, THE NEW ATLANTIS, vol. 3, 67 (explaining the possibility of a male eventually
development of the artificial womb itself will undoubtedly have a substantial impact on the realm of employment law within the context of federal parental leave.

Although many argue that ectogenesis may be a dangerous avenue for scientists to explore, others argue that it could be a solution for many problems associated with reproduction altogether. However, to the extent these issues could ever become relevant, it is necessary to provide specific information about the current technological advancements in reproductive science. Similarly, an explanation and detailed description about several prominent reproductive researchers and their respective contributions will provide the necessary groundwork for analyzing the potential advantages and disadvantages of eventual artificial womb utilization.

A brief review of past reproductive advancements, which includes the widespread popularity and societal acceptance of birth control pills, artificial insemination, in vitro fertilization (IVF), egg donations, and gestational surrogacy, demonstrates how humans, through the process of science and technology, seek to control, harness, and streamline the process of reproduction. According to bioethicists, the development of the artificial womb “completes this process.” Although ectogenesis may currently still be “within the realm of science fiction,” “[s]cientists predict that safe, reliable, and complete ectogenesis will be available within the next thirty years, and perhaps within as little as ten or five [years].”

There is significant speculation surrounding this issue of artificial womb development due in large part to the medical research conducted primarily by two prominent and intrepid

carrying a fetus to term); See also, Colleen Carlston, Artificial Wombs: Delivering on Fertile Promises, HARVARD SCIENCE REVIEW, 35, 36 (Fall 2008).

49 Ectogenesis – Panacea or Ethical Nightmare?, supra note 47.


51 Id.


53 Id.
reproductive researchers: Dr. Hung-Ching Liu, Director of the Reproductive Medicine Endocrine Laboratory of Cornell University’s Center for Reproductive Medicine and Infertility in New York City, and Dr. Yoshinori Kuwabara, Chairman of the Department of Obstetrics and Gynecology at Juntendo University in Tokyo. This Article will provide an overview of each of their respective contributions to this narrow field. Although these medical researchers focus on similar goals, their specific experiments differ in more nuanced and specified ways that require a more in-depth discussion.

a. Dr. Liu’s Technological Contributions and Reproductive Advancements in Creating a Mouse Embryo

Embryologist Dr. Liu, one of the world’s leading researchers in reproductive endocrinology, “stunned the world of reproductive medicine” when, in 2002, she claimed to have recreated a woman’s womb. Since that time, Dr. Liu has worked on, among many other things, helping women who have damaged uteruses conceive babies. Dr. Liu, a firm believer in the possibility of fetuses growing externally, has become known as the “nation’s premier womb-maker.”

Since 2001, Dr. Liu began growing sheets of human tissue that were composed of cells from the endometrium, which is

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56 The Center for Reproductive Medicine and Infertility, supra note 54. “Endocrinology” is defined as a branch of medicine concerned with the production of secretions that are distributed in the body by way of the bloodstream. Merriam-Webster Online Dictionary.
57 David Adam, Faking Babies: Scientists are developing artificial wombs, sperm and eggs – will this lead to reproduction in a dish?, The Guardian (May 18, 2005), http://www.guardian.co.uk/science/2005/may/19/science.health.
58 Carlston, supra note 48.
60 See Stedmans Medical Dictionary endometrium (27th ed. 2000) (defining “endometrium” as “[t]he mucous membrane comprising the inner layer of the uterine wall; it consists of a simple
essentially the lining of the uterus. This layer of endometrial cells, obtained through donations from infertile patients, is considered the “ideal platform on which to nurture an embryo, a medium almost as good as mom would have made.” Despite temporary success using human donor eggs and sperm to construct an embryo, Dr. Liu and her research team were forced to destroy the newly-formed embryos pursuant to federal regulations which specifically limit such external gestation to a mere ten days.

After their experiments using human embryos were curtailed due to the aforementioned federal regulation, in 2002 Dr. Liu and her team decided to experiment with a mouse embryo. In developing the mouse womb, Dr. Liu and her team needed to switch womb shapes, as a human womb is bowl-shaped, while a mouse womb is doughnut-shaped. They were able to develop a mouse embryo that grew almost to full term, as it retained the capacity to actually move and breath in an “endometrial tissue bubble,” but died after only a few days. This signifies a major area of reproductive technology and represents great strides in artificial womb research.

b. Dr. Kuwabara’s Technological Research and Reproductive Advancements to Externally Sustain a Goat Embryo in an Ectogenetic Chamber

A professor at Juntendo University in Tokyo, Dr. Kuwabara has achieved similar success in this field, as he created “[t]he closest approximation of an operational machine-womb.”

columnar epithelium and a lamina propria that contains simple tubular uterine glands”).

61 Reynolds, supra note 59.
62 Id.
63 Id. See also 42 U.S.C.A. § 289(g) (setting forth complex regulations governing fetal research and experimentation).
64 Id.
65 Id.
66 Id.
68 PERSONHOOD: PRO-LIFE & PRO-HUMAN POLICY FOR THE 21ST CENTURY, available at
Originally, Dr. Kuwabara’s interest in working with artificial wombs grew out of his clinical experience with premature infants.\(^69\) In describing his experiments, Dr. Kuwabara stated, “[i]t goes without saying that the ideal situation for the immature fetus is growth within the normal environment of the maternal organism.”\(^70\) However, rather than using an undeveloped mouse, Dr. Kuwabara instead removed goat fetuses from their mothers after only four months of normal gestation using cesarean sections.\(^71\) These Tokyo researchers have developed a process known as extrauterine fetal incubation (EUTI), which entails taking goat fetuses and threading catheters through the large vessels in the umbilical cord.\(^72\) Afterwards, these fetuses are supplied with oxygenated blood while suspended in incubators that contain artificial amniotic fluid heated to body temperature.\(^73\) Next, Dr. Kuwabara ensures that the fetuses’ connection of their umbilical cords remain hooked up to the tubes connected to an artificial placenta.\(^74\) This connection allows for machines to remove waste and supply the connected goats with essential nutrients.\(^75\)

Using this method, Dr. Kuwabara was quite successful, as a few goats survived without any deformities or lung problems up to three weeks, which is considered full term for a goat.\(^76\) Dr. Kuwabara stated that if he receives proper funding, his ectogenetic, amniotic-fluid based chamber could be used for humans within five years.\(^77\) Although Dr. Kuwabara has since passed away, his team of researchers continues onward, pursuing his work and reproductive goals.\(^78\)

\(^{69}\) Klass, supra note 55.
\(^{70}\) Id.
\(^{71}\) Reynolds, supra note 59.
\(^{72}\) Klass, supra note 55.
\(^{73}\) Reynolds, supra note 59.
\(^{74}\) Id.
\(^{75}\) Ectogenesis – Panacea or Ethical Nightmare?, supra note 47.
\(^{76}\) Reynolds, supra note 59.
c. Other Prominent Technological Advances

In addition to the two aforementioned researchers and their technological advances, there are also several other noteworthy developments. Specifically, Anecova, a Swiss company specializing in the manufacturing and commercialization of medically assisted reproduction,\(^79\) has begun experimental fertility trials using “silicon wombs.”\(^80\) This new device will provide researchers with the ability to “allow[] embryos created in the lab to be incubated inside a perforated silicon container [and] inserted into a woman’s own womb.”\(^81\) Subsequent to this insertion, “the capsule\(^82\) is recovered and some embryos are selected for implantation in the womb.”\(^83\) After the embryos are loaded inside, the ends are closed up. The container, which is “connected to a flexible wire that holds the device inside the uterus [contains] [a] thread [that] trails through the cervix to allow it to be recovered later on.”\(^84\)

Thomas Shaffer, Professor of Physiology and Pediatrics at the School of Medicine at Temple University, who began working with premature infants as a postdoctoral student in physiology, also provided significant contribution to artificial womb development.\(^85\) He has been working on liquid ventilation for almost 30 years. Liquid ventilation plays a crucial role in the artificial womb development, as “[l]iquid preserves the lung structure and function” throughout gestation.\(^86\) During this period, the fetus’s lungs are filled with the appropriately named “fetal lung fluid.”\(^87\) Professor Shaffer believed “ventilating these babies with a liquid that held a lot of oxygen would offer a gentler, safer way to take these immature lungs over the threshold toward the necessary goal of breathing

\(^81\) Id.
\(^82\) This capsule is only about 5mms in length and less than a 1mm in width. Furthermore, the capsule’s walls are perforated with 360 holes, which are each around only 40 microns across.
\(^83\) Simonite, supra note 80.
\(^84\) Id.
\(^85\) Klass, supra note 55.
\(^86\) Id.
\(^87\) Id.
III. Suggested Alteration to the Maternity Leave Statutory Construction to Accommodate Eventual Artificial Reproductive Technological Advancements

Understanding the focus and direction of reproductive technology provides the groundwork for speculation about its undoubted and rampant impact. However, this Article aims to focus on the artificial womb’s influence specifically upon employment law legislation as it pertains to federal parental leave.

Ectogenesis will indeed alter the current federal legislation governing parental leave. According to George Washington University Law Professor Naomi Cahn, author of several law review articles focusing on family law, feminist jurisprudence, and reproductive technology, "[Krill’s case] is certainly one of the first federal cases involving a claim to benefits for paid leave by a woman who has had children through a surrogate. It raises complex issues about parental leave, assisted reproductive [sic] technology and employment discrimination." Professor Cahn believes that “cases like Krill's [case] will become more common as surrogate births increase.” Thus, it is necessary to briefly discuss the law relevant to this particular area. Although Krill’s complaint alleges a variety of claims brought under many state-specific statutes, as well as federal statutes based on various discrimination claims, this Article focuses primarily on the future alterations to federal legislation pertaining to entitlement to parental leave, specifically 29 U.S.C.A. § 2612 of

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88 Id.
89 See supra Section I.
90 Kim, supra note 16.
91 Id. See generally June Carbone & Naomi Cahn, Embryo Fundamentalism, 18 WM. & MARY BILL RTS. J. 1015, at 1018 (“The demand for fertility services is growing.”); See also, Ainsely Newson, The Nature and Significance of Behavioral Genetic Information, 25 THEORETICAL MED. 89 (2004) (discussing how behavioral genetic information is distinguished from other genetic information).
92 Complaint, supra note 1.
93 Pregnancy Discrimination Act (PDA, Civil Rights Act of 1964, Title VII, Sec. 701 (k) and the American’s with Disabilities Act (ADA, 42 U.S.C.A. § 12101).
the Family and Medical Leave Act (FMLA). Under the FMLA, an employee, assuming his or her compliance with the requisite notice to their employer, is entitled to twelve weeks of unpaid leave for any of the following reasons:

(A) Because of the birth of a son or daughter of the employee and in order to care for such son or daughter. (B) Because of the placement of a son or daughter with the employee for adoption or foster care. (C) In order to care for the spouse, or a son, daughter, or parent, of the employee, if such spouse, son, daughter, or parent has a serious health condition. (D) Because of a serious health condition that makes the employee unable to perform the functions of the position of such employee. (E) Because of any qualifying exigency (as the Secretary shall, by regulation, determine) arising out of the fact that the spouse, or a son, daughter, or parent of the employee is on covered active duty (or has been notified of an impending call or order to covered active duty) in the Armed Forces.

The particular wording of this statute will likely become the eventual catalyst for a significant legislative dilemma:

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95 29 U.S.C.A. § 2612 (e)(1) states that when employee leave is foreseeable, such as a case in which a child would be born, including through surrogacy or external gestation, the employee shall provide the employer with not less than 30 days' notice, before the date the leave is to begin, of the employee's intention to take leave under such subparagraph, except that if the date of the birth or placement requires leave to begin in less than 30 days, the employee shall provide such notice as is practicable;

what exactly does “birth” mean? Should Congress rewrite legislation that is cognizant of and responsive to parents of children eventually being “born” using wholly new, scientific, and technologically advanced means? If so, how? Currently, according to Black’s Law Dictionary, “birth” is defined as “[t]he complete extrusion of a newborn baby from the mother’s body.” Furthermore, Merriam-Webster Dictionary defines “birth” as either “the emergence of a new individual from the body of its parent,” or, “the act or process of bringing forth young from the womb.” However, each of these definitions clearly fails to account for babies externally gestated through artificial wombs, as this particular baby would not have “extrud[ed] . . . from [a] mother’s body,” “emerge[d] from the body of its parent,” or be the “young from [a mother’s] womb.” Thus, a child gestated externally would not coincide with any of these above definitions. When the FMLA was originally constructed and passed in 1993, it seems that legislators did not (and perhaps could not) consider the possibility that the word “birth” may eventually carry with it such vagueness and indefiniteness. As advancements in reproductive technology continue, redefining “birth” seems inevitable if federal legislation is to properly address how parents seeking leave under the FMLA are to be treated. More commonly and informally, “birth” seemed fairly straightforward; the act of a mother extruding an internally gestated fetus. However, as discussed throughout this Article, the development of ectogenesis and other reproductive technologies may necessitate the redefining of exactly what it means to be born.

From an analytical perspective, the five explicitly listed reasons for the issuance of federal entitlement to unpaid parental leave in accordance with the FMLA seem to suggest, generally, that the FMLA’s primary purpose is to provide an employee with twelve weeks of leave to care for a family member. Applying this rationale to the artificial womb scenario, it is logical to assert that the FMLA, even without textual amendment, could encompass these types of parents. The underlying intent of the statutory language seems to provide a parent seeking leave with the opportunity to care for someone else. Assuming this intent is appropriately inferred, it seems

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97 29 U.S.C.A. § 2611, which provides definitions of other relevant words as applied throughout the statute, but fails to provide any definition for the term “birth.”
98 BLACK’S LAW DICTIONARY 179 (8th ed. 2004).
99 MERRIAM–WEBSTER ONLINE DICTIONARY.
reasonable to conclude that federal legislation, upon further reproductive technology development, must change to benefit parents who decide to utilize artificial wombs.

What if a woman was able to have an embryo inside her for only a few weeks, and then subsequently removed and implanted it into an artificial womb due to some unexpected disability? What if a woman wanted to utilize ectogenesis simply because she did not want to carry a child to full-term? Furthermore, would egg and sperm cells combined in an artificial womb and allowed to gestate until full term constitute “birth” as defined within the current applicable statutory construction? Although these questions do not necessarily require immediate congressional attention and focus, as they are still speculative and hypothetical in nature, some day, they will likely incite legislatures to redefine or more distinctly explain persons who will be entitled to paternal leave.

Accepting the assertion that ectogenesis development will impact future federal legislation, the congressional legislators themselves could rewrite the FMLA in primarily two distinct ways. These possibilities present diametrically opposed implications for various types of parents, as their entitlement to paid or unpaid maternity and paternity leave hinges on the intent of the legislators.

The first possibility would be for legislators to deliberately frame the statute in a way that purposely included all possible, and even unforeseeable, ways in which a child may be brought into this world. This possibility would obviously encompass birth using artificial wombs. The second possibility for legislators would be much more socially conservative and deliberately frame the statute in a way that excluded all manners of “birth” that are non-traditional. Whether Congress decides to expand the protections afforded to parents under the FMLA through the use of the broad and inclusive first possibility, or to narrow the scope of protections afforded to parents under the FMLA through delimiting the statute by using the exclusive second possibility, Congress’s restructuring of the statute will have drastic affects on how mothers and fathers decide to live their lives.

IV. The Importance of Preserving Entitlement to Parental Leave for Parents who Utilize Ectogenesis

101 Ectogenesis – Panacea or Ethical Nightmare?, supra note 47.
A significant portion of the remainder of this Article will focus on why the redefining of “birth,” as used within the aforementioned statute, should be restructured to subsume the class of parents who decide to utilize artificial wombs. Currently, women are traditionally entitled to maternity leave for two main reasons: (1) to provide them with time to recuperate and rest from the physical and mental hardships associated with giving birth, and (2) provide them with bonding time to spend with their newborn(s). According to §2601(b)(1), one of FMLA’s purposes is “to balance the demands of the workplace with the needs of families, to promote the stability and economic security of families, and to promote national interests in preserving family integrity.” This statement reflects unambiguous support for the above-mentioned second, traditional rationale for entitlement to maternity leave.

a. The Importance of Parent-Child Bonding

Although parents who decide to utilize artificial wombs do not need maternity leave for the first reason (time to recuperate and rest from the physical and mental hardships associated with actually giving birth), the second reason (providing parents with time to actually spend with their newborn), should, in and of itself, justify parental leave. According to Seton Hall University School of Law Professor Gaia Bernstein,

[w]hen surrogacy agreements are enforced[,] the law treats the intended mother as the mother in all respects. The purpose of a maternity leave is not just to enable the mother to recuperate from giving birth but to enable her to bond with the baby. This is even more important for a mother who did not bond through pregnancy.

The importance of bonding with a newborn cannot be overstated, and thus, new parents should not be denied that same bonding opportunity without the assurance that their employment will not be jeopardized. Aside from the normative and

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102 See supra Section IV.
104 See infra Section V (a).
105 Kim, supra note 16.
emotional appeal of bonding between child and parent, substantial medical, psychological, and sociological studies reveal that this bonding period serves as a paramount concern for both the child and the parent alike.\footnote{See supra notes 73 - 82 and accompanying text.}

The National Institute of Child Health and Human Development (NICHD) conducted a Study on Early Child Care (SECC) and compiled extensive data based on 1,364 participants.\footnote{Decades of Data: Landmark NICHD Study Releases Another Finding, Expanding Its Productive Legacy, NATIONAL INSTITUTE OF CHILD HEALTH AND DEVELOPMENT (July 17, 2008), available at http://www.nichd.nih.gov/news/resources/spotlight/071708_Decades_of_Data.cfm.} The intent of this research was to “provide evidence-based data about children, their outcomes, and the environments in which they develop – from child care during infancy and toddlerhood, through to ninth grade.”\footnote{Id.} This study, which included statistics regarding “a broad set of family-based outcomes such as maternal health and mental health, parental stress and quality of parenting,” was the “most comprehensive study of children and the environments in which they develop.”\footnote{Id.} Researchers Pinka Chatterji, Sara Markowitz, and Jeanne Brooks-Gunn used the NICHD statistics to analyze parent-child interactions.\footnote{Meredith Melnick, Study: Why Maternity Leave is Important, TIME HEALTHLAND (July 21, 2011), available at http://healthland.time.com/2011/07/21/study-why-maternity-leave-is-important/.} Furthermore, in an attempt to discover how well mothers related to their children, the researchers observed parent-child interactions in a controlled laboratory setting and determined levels of “maternal sensitivity.”\footnote{Id.} In their study, the researchers considered “the mothers’ working hours, job flexibility, depression, stress, self-reported health and overall family well being.”\footnote{Id.} Unsurprisingly, the researchers concluded that mothers of 3-month-old infants who worked full-time experienced “greater rates of depression, stress, poor health and overall family stress” than mothers who stayed home with their children.\footnote{Id. These results certainly seem logical, as common knowledge suggests that the addition of parental responsibilities, when coupled with occupational responsibility, tends to increase the level of a person’s relative stress.}
b. The Importance of a Child’s Physical Well Being and Their Mental, Emotional, and Development Health

As discussed throughout several medical publications, medical journals, and the like, “bonding is essential for a baby.” Babies bond in a variety of ways, including through touch, eye-to-eye contact, following moving objects with their eyes, imitating facial expressions and sutures, and voice recognition. Assuming that babies born through artificial wombs learn, grow, and develop similarly to naturally born babies, this time period in their life will be equally as important. Thus, each of these newborn capacities, while extremely important developmentally, are not utilized fully when a mother is denied equal entitlement of maternity leave merely because their baby was not “born” in the normal, traditional way that most people recognize.

Implicit within the statutory language of the FMLA is an understanding that the bonding period between a parent and his or her child is of utmost importance, as 29 U.S.C.A. § 2612 (a)(1)(A) states that an employee is eligible for twelve weeks of leave “because of the birth of a son or daughter of the employee and in order to care for such son or daughter.” Also, according to a House Report to Congress focusing on paid parental leave, the Office of Personnel Management was to determine whether, amongst other things, providing federal employees paid paternal leave would in fact “contribute to parental involvement during a child’s formative years.” Furthermore, analysis of the FMLA’s legislative history reveals that Congress perhaps recognized that parental leave “is important for the development of children and the family unit

115 KIDSHEALTH, supra note 106.
116 Id.
117 See generally Lydia Millet, Love in Infant Monkeys, WILLOW SPRINGS 19, 20-21, available at http://willowsprings.ewu.edu/archives/millet.pdf (explaining the results of a study conducted to test baby monkeys’ ability to recognize their biological mothers over a mannequin covered in a terrycloth dressed to look like their mother and concluding that a “bad mother is better than none”).
[and] that fathers and mothers be able to participate in early childrearing.”

Although this legislation may define birth in a way that linguistically precludes those born by way of ectogenesis, preventing new mothers the necessary bonding time with their new baby hinders that baby’s ability to “mak[e] an attachment” or even “build a support system.” The maternity leave statute as written, which fails to specifically define “birth,” could, unless properly amended, lead to the eventual preclusion of babies born from artificial wombs to have the opportunities that other babies born naturally are entitled to.

According to physician and author Dr. Gabor Maté, there are two kinds of memory; recall memory, also known as explicit memory, and emotional memory, also known as implicit memory. Recall memory refers to a person’s capacity to remember facts, details, episodes, or circumstances and subsequently reiterate them. However, the hippocampus, a structure in the human brain which encodes recall memory, is not developed for nearly a year and a half after birth and is not fully developed until much later. This explains why hardly anybody can remember being less than two years old. Conversely, emotional memory is “where the emotional impact and the interpretation the child makes of those emotional experiences are ingrained in the brain in the form of nerve circuits ready to fire without specific recall.” In other words, due to the lack of development in the hippocampus, people are unable to utilize recall memory at an early age. But, emotional experiences during that same time frame are deeply embedded in the brain, leading to that person’s

120 KidsHealth, supra note 106.
122 The word “naturally” here refers to a typical, conventional birth, which Black’s Law Dictionary defines as “[t]he complete extrusion of a newborn baby from the mother’s body.” 179 (8th ed. 2004)
123 Zeitgeist: Moving Forward, at 26:05 – 28:30 (describing infancy memory and how “early experiences shape adult behavior”).
124 Id.
125 Id. E.g. People who were adopted, although they may not have specific recall of their adoption, very often retain a lifelong sense of rejection.
future interpretations of their world outlook. Due to the function of emotional memory, children subjected to serious emotional and physical harm at a young age are frequently distrustful of others and unable to form intimate relationships, despite their inability to actually recall such events.

Richard Wilkinson, Emeritus Professor of Social Epidemiology at the University of Nottingham describes how the life of a mother, whether she may be stressed from a hard day at work or suffering from postpartum depression, could significantly, negatively, and directly impact her child’s emotional memory, which, as previously discussed, can have serious repercussions later in life. This reality only serves to strengthen the overall movement and support for both artificial womb development and continued entitlement to maternity leave. Hypothetically, if a woman were to utilize an artificial womb and still be given maternity leave, she would be able to circumvent the possibility of “passing on” the negative effects of postpartum depression onto her child. Moreover, the mother would not risk coming home from a rough day at work and exposing her newborn child to a negative environment.

Furthermore, the bonding between a parent and child can be of the utmost importance for a multitude of reasons. Similarly, this bonding period proves essential to the child’s health as well. However, it is important not to exclude the mother’s health as another consideration when determining parental leave eligibility. A recent study reveals that new parents...

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126 Id. E.g. Virtually all “hard-core” drug addicts were “significantly abused as children or suffered severe emotional loss.”
127 Id. See also Dr. Maté’s description of “proximal abandonment” as one of the methods by which children are negatively affected by the environment provided by their parents. Id.
128 Id. at 29:44 – 31:18 (describing how structural differences in early life “have very powerful effects programming children’s development” and future adult behavior).
129 Zeitgeist: Moving Forward, supra note 123.
130 See supra Section V (a).
131 See supra Section V (b).
mothers “saw greater growth in their emotion-processing regions” after spending time with their newborns.  

V. Comparison Between US and European Maternity and Paternity Leave Statutory Construction

Currently, the differences between parental leave policies between the United States and European nations are vast, both in length and overall entitlements.  As mentioned above, “[m]ost [American] employees also are entitled to a total of up to 12 weeks of unpaid leave under the FMLA for specified family and medical needs, including care of a newborn or newly adopted child.” However, parental leave policies throughout European countries are much more liberal and expansive than the leave policies granted in the U.S. In fact, “the duration of statutory maternity leave ranges from 14 to 28 weeks across the [European Union] Member States, with most national provisions falling within the range of 15 to 20 weeks.” The differences in parental leave policies between the U.S. and European countries are drastic, as “[m]andatory leave periods (whether partial or over the entire leave entitlement) exist in 12 of the 15 European Union states, and two countries prohibit certain types of work during pregnancy.”

Specifically, Sweden is considered amongst the top countries in terms of parental leave. In fact, it heavily enforces a mandatory “Daddy Leave” employment scheme that consists of a mandatory fourteen months of combined paid parental leave. Enacted in 1995, the Swedish parental leave policy “offers the most generous combination of time and

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133 Id.
134 Paid Parental Leave, supra note 118.
135 29 U.S.C.A. § 2612; supra Section IV.
136 Paid Parental Leave, supra note 118.
137 Id.
139 Id.
140 Video Tape: Paternity Leave in Sweden - Video, YOUTUBE (June 29, 2008), available at http://www.youtube.com/watch?v=fz5FJkqWhbQ (highlighting both the frequency and acceptability of paternity leave in Sweden).
141 Id.
financial support to parents . . . provid[ing] 480 days of leave per child up to the age of eight years or until they complete their first year of school.” 142 Furthermore, parents in the Swedish system are “supported by a high earnings-related payment for most of the leave period, and offers parents a great deal of flexibility to use the leave in more than one block period and on a part-time or full-time basis.” 143 Sweden’s current statutory model 144 serves as a prime example of the overarching, international acceptance of parental leave. Eventually, it could become an externality of effective ectogenesis development here in the U.S.

Many researchers posit that capitalism in the U.S. serves as the root of the current apprehension towards providing expansions in parental leave. 145 Some argue that the severe disconnect between the U.S. approach and other westernized countries’ approach stems from the differences in perception of economic wealth and ways of achieving overall happiness. 146 Simply put, capitalism in the U.S. explains at least some portion of the current apprehension towards increasing accessibility to parental leave. 147 For example, the U.S. is dominated largely by capitalist economic ideologies, driving people to make decisions based on their potential to yield monetary profits, not necessarily their families and children’s best interests. 148

The development of artificial wombs will not only impact new mothers, but new fathers as well. The FMLA, as currently written, reveals “much of the language in Congress's findings

142 Anxo, supra note 138, at 5.
143 Id.
146 Id.
147 Id.
148 Id.
and purposes is gender neutral.” However, “in reality, the FMLA champions the cause of mothers to a greater extent than it does that of fathers.” Some posit that men utilize time for leave at a lesser rate than women due to harshly negative social stigmas attached to paternity leave. Over time, artificial womb development may stand to positively alter and increase the amount of time that fathers feel comfortable taking off of work to care for their children.

**Conclusion**

This Article began by explaining Krill v. Cubist Pharmaceuticals, Inc., a case pending in the United States District Court for the District of Massachusetts, which focuses specifically on a mother’s entitlement to paid maternity leave through her employment contract despite a surrogate mother giving birth to her and her husband’s children. This provided the groundwork for an analysis of artificial womb development, because if the Massachusetts Court finds Krill entitled to maternity leave despite her not actually giving birth in the traditional and more conventional sense, the decision could eventually provide support for parental entitlement to leave for those who utilize artificial wombs to beget children. Next, the Article provided a thorough background of the current progress of reproductive technology development by describing the research and experimentation conducted by Dr. Hung-Ching Liu, Director of the Reproductive Medicine Endocrine Laboratory of Cornell University’s Center for Reproductive Medicine and Infertility and Dr. Yoshinori Kuwabara of Juntendo University primarily in the area of artificial wombs. Furthermore, this Article explained several other prominent technological advancements in reproductive capabilities, including the research of Thomas Shaffer, Professor of Physiology and Pediatrics at the School of Medicine at Temple University. These developments discussed above will eventually lead to a necessary amendment to the definition of “birth” as used in the Family and Medical Leave Act set forth by 29 U.S.C.A. §§ 2601-2654. Consequently, this Article promotes the view that not only

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150 Id.
151 Id.
152 See supra Section II.
153 See Section III (a)-(b).
154 See Section III (c).
should Congress alter the applicable federal legislation to incorporate and address potential issues raised by its current definition of “birth,” but also how exactly to amend the statute itself. The revised statutory language\(^{155}\) should broaden the scope and inclusiveness of “birth” itself as a means to account for children eventually born through artificial wombs, as parental leave provides countless benefits to children and parents alike.\(^{156}\) Despite the plethora of objections\(^ {157}\) to the general notion of babies gestating externally through scientific means, mainly artificial wombs, it seems that reproductive technology will eventually at least present society with this possibility. Ultimately, if society is willing and able to accept the usage of artificial wombs, it stands to reason that federal legislation, specifically 29 U.S.C.A. § 2612 of the Family and Medical Leave Act, must be rewritten to adequately define “birth” to properly respond to these prospective issues.

\(^{155}\) See Section IV.

\(^{156}\) See Section V (a)-(b).

\(^{157}\) Many of these objections are described in the Note’s introduction, which provides examples of moral, ethical, religious, societal, environmental, and sexual, and other personal objections to artificial womb development.