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SPECIAL ISSUE: ETHICS OF ECTOGENESIS

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Equitable access to ectogenesis for sexual and gender minorities

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Abstract

As the technology for ectogenesis continues to advance, the ethical implications of such developments should be thoroughly and proactively explored. The possibility of full ectogenesis remains hypothetical at present, and myriad concerns regarding the safety and efficacy of the technology must be evaluated and addressed, while pressing moral considerations should be fully deliberated. However, it is conceivable that the technology may become sufficiently well established in the future and that eventually full ectogenesis might be deemed ethically acceptable as a reproductive alternative to gestation within a human womb under certain circumstances. If the safety and efficacy of full ectogenesis are established, if ethical dilemmas are sufficiently well addressed, and if the technology is offered as a reproductive option to cisgender heterosexual individuals or couples desiring to become parents, there is a moral obligation grounded in social justice to ensure that full ectogenesis be made available to individuals or couples identifying as members of sexual- or gender-minority groups who likewise seek to pursue parenthood. We examine the history of access to current family-building options, including assisted reproductive technology, surrogacy and adoption, for these populations and conclude that in the absence of robust empirical evidence suggesting an increased risk of harm to children of individuals and couples who identify as members of sexual- or gender-minority groups, equitable access to ectogenesis as a pathway to parenthood for sexual and gender minorities must be assured as a matter of reproductive justice.

KEYWORDS

assisted reproductive technology, ectogenesis, equity, ethics, LGBTQ, social justice

1 | INTRODUCTION

Ectogenesis represents a new frontier in assisted reproductive technology (ART). Presently, little is known about the physiological and psychological effects that full gestation in an artificial womb might have on any offspring, and ethical dilemmas regarding the consequences of the technology abound.[1] The welfare of any offspring created through ectogenesis must be fully explored in any moral deliberations about the use of this technology for humans. Furthermore, scholars have raised substantial moral concerns that the ability to create embryos and gestate foetuses (or 'gestatelings'[2]) ex vivo could lead to the commodification of embryos and the loss of potential personhood, along with other undesirable consequences, including the development of a boutique

[1]Mitchell, C. B. (2017). Ectogenesis and the future of procreation. *Ethics & Medicine*, *33*(3), 133–134.

[2]Romanis, E. C. (2018). Artificial womb technology and the frontiers of human reproduction: Conceptual differences and potential implications. *Journal of Medical Ethics*, *44*(11), 751–755.

industry for research purposes, the creation of organs for transplant, the devaluing of traditional gestation and motherhood, and the exacerbation of social inequities related to access based on ability to pay.[3]

The question of whether full ectogenesis, whereby an embryo created through in vitro fertilization (IVF) is gestated in an artificial womb for the full duration of gestation, should be allowed to proceed represents a multi-faceted moral deliberation, with many dimensions that are more thoroughly addressed elsewhere,[4] including in this Special Issue. Our intention is not to debate whether it is ethical to move forward with full ectogenesis as a human reproductive option; rather, we begin from the assumption that the technology exists and has been developed sufficiently for use in humans and deemed morally appropriate for use by cisgender heterosexual individuals. Starting from that assumption, if full ectogenesis (hereafter referred to as 'ectogenesis') meets widely agreed upon standards of safety and efficacy for use in humans, and if ectogenesis is offered to cisgender heterosexual individuals or couples desiring to become parents, we argue that there is a moral imperative to ensure equitable access to ectogenesis for all sexual- and gender-minority individuals or couples desiring to become parents.

Proceeding from a Rawlsian approach to equality,[5] most theories of social justice demand that the bar for eligibility be set equitably across groups to avoid potential discrimination based on social-worth criteria.[6] Historically, equitable access to ARTs (including surrogacy and newer experimental technologies such as uterine transplantation) and adoption has been limited, based largely on a biologically driven gendered, heteronormative marital model that does not reflect the diverse social dimensions of parenthood.[7] This model has excluded many individuals who might desire to be parents, further exacerbating their marginalized status.[8] We have argued elsewhere that access to uterine transplantation, if determined to be safe and effective, should not be denied to individuals who identify as transgender or gender-diverse solely on the basis of their gender identities.[9] Although uterus transplantation and ectogenesis differ in some ways, our stance is similar; namely, that individuals should not be excluded from access to reproductive options and/or paths to parenthood on the basis of socially stigmatized categorical differences, absent substantial empirical evidence documenting the direct relevance of these factors to the safety and wellbeing of their potential children.

2 | QUALIFICATIONS FOR PARENTHOOD: AN INCLUSIVE VIEW

Various philosophical viewpoints have been articulated to address the concept of parenthood and criteria for parental status, ascribing differing moral valence to roles, rights, responsibilities, duties and obligations. In our view, parenthood represents a composite of multiple domains. We advocate for a pluralist account of parenthood grounded in the fundamental assumption that the many facets of parenthood cannot be adequately encompassed by narrow conceptualizations.[10] Further, while some theoretical perspectives recognize the primacy of biogenetic connection, we focus instead on a broad conception of parenthood that embraces social rather than exclusively genetic or biological pathways to parental status.

As family patterns continue to shift over time,[11] an inclusive approach to parental recognition best captures and supports diversity in social arrangements and family structures within and across cultures, keeping the focus of parental status relational rather than biogenetic. This broad notion of kinship reflects both an emphasis on the significance of caregiving and a commitment to upholding kinship arrangements in the absence of robust empirical evidence suggesting that 'non-traditional' (i.e. non-cisgender heteronormative) arrangements increase the risk of harm to children. Moreover, once an individual is legally accorded parental status, they are likely to retain it: in most instances, the state's right to intervene in the best interest of the child and to restrict or terminate the custody of a legal parent is limited to substantiated cases of abuse or severe neglect.

3 | ECTOGENESIS: CONSIDERATIONS FOR SEXUAL AND GENDER MINORITIES

Ectogenesis presents a number of potential benefits for sexual- and gender-minority individuals seeking to become parents. For individuals who are able to produce their own biological gametes or who have preserved gametes for future procreation, ectogenesis could provide the opportunity for genetic parenthood, if desired. Whether using biological or donor gametes, the technology would offer an alternative to employing the services of a surrogate for gestation, circumventing the complications (legal, medical and otherwise) that may accompany pregnancy and birth achieved through surrogacy. Ectogenesis would also provide another option for prospective parents who might otherwise pursue parenthood via adoption, which can be difficult to access for sexual- and gender-minority individuals owing to widespread, institutionalized social stigma. It

[3]Singer, P., & Wells, D. (1984). *The reproduction revolution: New ways of making babies*. Oxford, U.K.: Oxford University Press.

[4]Smajdor, A. (2012). In defense of ectogenesis. *Cambridge Quarterly of Healthcare Ethics*, *21*(1), 90–103; Räsänen, J. (2017). Ectogenesis, abortion and a right to the death of the fetus. *Bioethics*, *31*(9), 697–702.

[5]Rawls, J. (2009). *A theory of justice*. Cambridge, MA: Harvard University Press.

[6]Ruger, J. P. (2004). Health and social justice.*Lancet*, *364*(9439), 1075–1080; Sen, A. (2002). Why health equity? *Health Economics*, *11*(8), 659–666; Häyry, M. (2018). Doctrines and dimensions of justice: Their historical backgrounds and ideological underpinnings. *Cambridge Quarterly of Healthcare Ethics*, *27*(2), 188–216

[7]Nejaime, D. (2017). The nature of parenthood. *Yale Law Journal*, *126*(8), 2260–2381.

[8]Ibid.

[9]Sampson, A., Kimberly, L. L., Goldman, K. N., Keefe, D. L., Quinn, G. P. (2019). Uterus transplantation in women who are genetically XY. *Journal of Medical Ethics*, *45*(10), 687–689.

[10]Nejaime, op. cit. note 10.

[11]Chambers, D. (2012). *A sociology of family life*. Cambridge, U.K.: Polity Press.

could even be argued that, should uterine transplantation become a widely available option in the meantime, ectogenesis would offer an alternative, eliminating the surgical and immunosuppressive risks associated with uterine transplantation for transplant recipients.

For couples in which one partner might otherwise have served as gestational carrier, ectogenesis offers an opportunity for equal parental contributions and distribution of the burdens incurred during pregnancy and birth. While the same is true for cisgender heterosexual couples, the availability of ectogenesis would have the potential to alleviate the distress reported by some transgender men who choose to go through pregnancy, an experience that may exacerbate gender dysphoria.[12]

The prospect of ectogenesis for sexual- and gender-minority individuals is not without potential risk (above and beyond any risks to a human being fully gestated in an artificial womb). Financial barriers to access could create greater disparity and further marginalize certain subpopulations, particularly for people who identify as members of multiple minority groups (for example, people of colour who also identify as a sexual or gender minority). Moreover, although adoption may be difficult to access for many sexual- and gender-minority individuals, it is possible that the availability of ectogenesis as an alternative may reduce rates of adoption, thereby relegating more existing children to state custody. It is also conceivable that the use of ectogenesis might have an unintended negative impact on kinship networks for members of sexual and gender minorities, although the converse may be just as likely.

It is also interesting to consider feminist critiques of the implications of ectogenesis for gender equality and how these concerns may be relevant to providing access to ectogenesis to sexual- and gender-minority individuals, moving the discussion beyond considerations of the wellbeing of any resulting children to the wellbeing of women more globally. Feminist concerns around whether ectogenesis would promote or diminish gender equality have not been resolved. One perspective is that ectogenesis originates from a patriarchal desire to maintain power over women's bodies, men control reproduction.[13] From this stance, ectogenesis poses a threat to women's autonomy over reproduction because it eliminates the experience of pregnancy altogether,[14] and potentially precludes the unique and necessary role of women for ensuring perpetuation of the species.[15] By extension of this reasoning, feminist scholars raising these concerns about the potential of ectogenesis to disempower women by diminishing their role in the reproductive process may have reservations about ectogenesis as a pathway to parenthood for sexual- and gender-minority individuals. However, an alternative feminist approach suggests that there is a strong argument that ectogenesis could offer more freedom and choice for women who desire biological offspring but who cannot or do not desire to carry the pregnancy, which has the potential to increase gender equity if carried out within adequate ethical parameters.[16] It is hard to imagine that the freedom and choice afforded to cisgender heterosexual women would not also apply to sexual- and gender-minority individuals who desire to become parents but who may not be physically able to carry a pregnancy or may desire to become parents without the experience of gestation and birth.

4 | SOCIAL AND REPRODUCTIVE JUSTICE FOR SEXUAL AND GENDER MINORITIES

A growing body of empirical evidence suggests that sexual and gender minorities are subject to profound stigma and discrimination that are manifested on interpersonal and structural levels, and that lead to adverse health and mental health outcomes, including increased rates of depression, anxiety, substance abuse, and even suicide.[17] The minority-stress theoretical perspective accounts for these adverse outcomes by providing a conceptual framework that demonstrates the processes whereby stigma and discrimination towards individuals who identify as sexual and gender minorities are experienced in the form of stress over the life course.[18]

Cultural beliefs surrounding sexuality, gender roles and conformity, including laws and policies, perpetuate the inequities that sexual- and gender-minority individuals face.[19] Through diagnoses and labelling as 'other', structural stigma operates widely across communities and institutions for the sake of maintaining the power of hetero- and cis-normativity.[20] These prejudices affect both the perception of sexual- and gender-minority parenting and the access of sexual- and gender-minority individuals to the means for achieving biological parenthood. For example, heterosexist beliefs are associated with more negative beliefs about same-sex parenting,[21] and with negative attitudes to-

[12] Light, A. D., Obedin-Maliver, J., Sevelius, J. M., & Kerns, J. L. (2014). Transgender men who experienced pregnancy after female-to-male gender transitioning. *Obstetrics & Gynecology*, *124*(6), 1120–1127.

[13] Langford, S. (2008). An end to abortion? A feminist critique of the 'ectogenetic solution' to abortion. *Women's Studies International Forum*, *31*(4), 263–269.

[14] Murphy, J. S. (1989). Is pregnancy necessary? Feminist concerns about ectogenesis. *Hypatia*, *4*(3), 66–84.

[15] Smajdor, A. (2016). Ectogenesis. In: H. ten Have (Ed.), *Encyclopedia of global bioethics*, (pp. 1011–1021). Cham: Springer.

[16] Smajdor, A. (2007). The moral imperative for ectogenesis. In *Cambridge Quarterly of Healthcare Ethics*, *16*(3), 336–345.

[17] Institute of Medicine. (2011). The *health of lesbian, gay, bisexual, and transgender people: Building a foundation for better understanding*. Washington, D.C.: National Academies Press.

[18] Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*, *129*(5), 674–697; Hendricks, M. L., & Testa, R. J. (2012). A conceptual framework for clinical work with transgender and gender nonconforming clients: An adaptation of the Minority Stress Model. *Professional Psychology: Research and Practice*, *43*(5), 460–467.

[19] Grant, J. M., Mottet, L. A., Tanis, J., Harrison, J., Herman, J. L., & Keisling, M. (2011). *Injustice at every turn: A report of the national transgender discrimination survey*. Washington, DC: National Center for Transgender Equality and National Gay and Lesbian Task Force; Hatzenbuehler, M. L. (2009). How does sexual minority stigma "get under the skin"? A psychological mediation framework. *Psychological Bulletin*, *135*(5), 707–730.

[20] Valentine, D., 2007. *Imagining transgender: An ethnography of a category*. Durham, NC: Duke University Press; White Hughto, J. M., Reisner, S. L., & Pachankis, J. E. (2015). Transgender stigma and health: A critical review of stigma determinants, mechanisms, and interventions. *Social Science & Medicine*, *147*, 222–231.

[21] Costa, P. A., Pereira, H., & Leal, I. (2019). Through the lens of sexual stigma: Attitudes toward lesbian and gay parenting. *Journal of GLBT Family Studies*, *15*(1), 58–75; Ioverno, S., Carone, N., Lingiardi, V., Nardelli, N., Pagone, P., Pistella, J., … Baiocco, R. (2018). Assessing prejudice toward two-father parenting and two-mother parenting: The beliefs on same-sex parenting scale. *Journal of Sex Research*, *55*(4-5), 654–665.

ward ART and adoption.[22] At the structural level, laws protecting 'religious liberty' in the United States, for example in the state of Mississippi, effectively legalized discrimination based on an individual's religious beliefs, including the right to deny 'treatments, counseling, or surgeries related to sex reassignment or gender identity transitioning' and 'psychological, counseling, or fertility services' to those whose identities infringe upon one's religious beliefs.[23] Some countries, such as Japan, and several states in the United States require transgender individuals to be sterilized in order to be legally recognized as their genders.[24] Cultural norms and beliefs become embedded within society through laws and policies that limit protections and reduce the reproductive freedom of sexual- and gender-minority individuals.

In the United States, the constitution protects an individual's right to procreate. Whether that right extends to procreation through ART is unresolved.[25] Transgender individuals may experience impaired fertility owing to hormonal treatments or total infertility owing to surgical interventions. Same-sex-oriented individuals are argued to have 'relational' infertility or 'dysfertility' by virtue of the biological impossibility of procreation through sexual intercourse between same-sex cisgender individuals.[26] ART is required for procreation for sexual- and gender-minority individuals in same-sex relationships and for many of those who undergo gender-affirming procedures. Research indicates that transgender adults report a wide variety of attitudes and desires toward biological parenthood, with 18–54% of transgender adults and 24–36% of transgender youths indicating parental desire.[27] Support from one's family has been associated with the desire to become a parent, and thus there may be an intergenerational effect on desire for procreation. Reducing access to ART, including ectogenesis as a future reproductive option, would systematically affect this population's ability to choose biological parenthood. NeJaime (2015) states that 'understanding procreation in the context of same-sex families suggests that ART, as an acceptable and available mode of family formation, is essential to sexual orientation equality and to same-sex couples' procreative liberty',[28] which logically extends to transgender and non-binary individuals who are either in relationships with individuals who have concordant reproductive organs (e.g. transgender man and cisgender woman) or who undergo fertility preservation and seek to utilize ART to use their gametes or embryos in the future.

With regard to cultural differences, most of the arguments for reproductive justice are centred on individual choice (i.e. autonomy). However, cultures that do not ascribe individualistic beliefs to reproductive justice but exhibit a more collectivist orientation might have other driving forces for what constitutes justice.[29] The evolution of pathways to parenthood for sexual and gender minorities, including ART, surrogacy and adoption, reflects deeply ingrained patterns of stigma and discrimination, and can also shed light on some of the relevant ethical considerations informing the discussion about ectogenesis as a future reproductive option.

5 | ELIGIBILITY FOR FAMILY-BUILDING OPTIONS

5.1 | Assisted reproductive technology

ART has traditionally had limited criteria for use among adults in the United States. Typically, the criteria required relate to medical evidence of infertility or sub-fertility and to physiological factors related to the ability to tolerate treatment. Some IVF centres now have age requirements, for example that the combined age of the prospective parents cannot be greater than 100 and that no parent may be younger than 18. These age restrictions are in consideration of the welfare of the future child such that he or she would have at least one parent who may be alive through their adulthood. In contrast, Switzerland, for example, developed comprehensive legislation in 2001 that strictly regulates the use of ART with regard to concern for the welfare of children conceived through ART.[30] Specifically, the Swiss legislation states, 'the future well-being of the child must rank as the most important criterion before initiating ART treatment'. It has been suggested that such high thresholds are a threat to autonomy and increase the likelihood of discrimination against individuals with socio-economic or physical/mental health issues. The American Society of Reproductive Medicine (ASRM) posits the need for balance between respect for the autonomy of the desire of prospective parents for ART treatment and the need to prevent harm to a future child.[31] The European Society of Human

[22] Ibid.

[23] Protecting Freedom of Conscience from Government Discrimination Act, HB1523. (2016).

[24] Taniguchi, H. (2013). Japan's 2003 Gender Identity Disorder Act: The sex reassignment surgery, no marriage, and no child requirements as perpetuations of gender norms in Japan. *Asian-Pacific Law & Policy Journal, 14*(2), 108–117; Movement Advancement Project. (2019). *Equality maps: Identity document laws and policies.* Retrieved from http://www.lgbtmap.org/equality-maps/identity_document_laws [accessed Apr 29, 2019].

[25] Boucai, M. (2016). Is assisted procreation an LGBT right? *Wisconsin Law Review, 2016*(6), 1065–1126.

[26] Ikemoto, L. C. (1995). The in/fertile, the too fertile, and the dysfertile. *Hastings LJ*, *47*, 1007– 1061; Murphy, J. (1999). Should lesbians count as infertile couples? Antilesbian discrimination in assisted reproduction. Donchin A., & Purdy L. Op. cit. 103–120.

[27] Tornello, S. L., & Bos, H. (2017). Parenting intentions among transgender individuals. *LGBT Health*, *4*(2), 115–120; Wierckx, K., Van Caenegem, E., Pennings, G., Elaut, E., Dedecker, D., Van de Peer, F., … T'sjoen, G. (2011). Reproductive wish in transsexual men. *Human Reproduction*, *27*(2), 483–487; De Sutter, P., Kira, K., Verschoor, A., & Hotimsky, A. (2002) The desire to have children and the preservation of fertility in transsexual women: A survey. *International Journal of Transgenderism*, *6*(3), 215–221; Riggs, D. W., Power, J., & von Doussa, H. (2016). Parenting and Australian trans and gender diverse people: An exploratory survey. *International Journal of Transgenderism*, *17*(2), 59–65; Strang, J. F., Jarin, J., Call, D., Clark, B., Wallace, G. L., Anthony, L. G., … Gomez-Lobo, V. (2018). Transgender youth fertility attitudes questionnaire: Measure development in nonautistic and autistic transgender youth and their parents. *Journal of Adolescent Health*, *62*(2), 128–135; Chen, D., Matson, M., Macapagal, K., Johnson, E. K., Rosoklija, I., Finlayson, C., … Mustanski, B. (2018). Attitudes toward fertility and reproductive health among transgender and gender-nonconforming adolescents. *Journal of Adolescent Health*, *63*(1), 62–68.

[28] NeJaime, D. (2015). Griswold's progeny: Assisted reproduction, procreative liberty, and sexual orientation equality. *Yale Law Journal Forum*, *124*, 340–348, p. 347.

[29] Häyry, op. cit. note 9.

[30] De Geyter, C., Boehler, B., & Reiter-Theil, S. (2010). Differences and similarities in the attitudes of paediatricians, gynaecologists and experienced parents to criteria delineating potential risks for the welfare of children to be conceived with assisted reproduction. *Swiss Medical Weekly,140*, w13064.

[31] Ethics Committee of the American Society for Reproductive Medicine. (2013). Access to fertility treatment by gays, lesbians, and unmarried persons: A committee opinion. *Fertility and Sterility*, *100*(6), 1524–1527.

Reproduction and Embryology (ESHRE) states there is no 'absolute' autonomy of the infertile couple and suggests that concerns about prospective parents' medical issues (e.g. HIV+, hereditary conditions) as well as psychosocial factors (i.e. child abuse, violence in the family, addiction, poverty, single parenthood, widowhood) should allow clinicians latitude to refuse to treat.[32]

An argument invoked to counter the 'right' to use ART is that infertility, while an official disease, is not life-threatening. This is because ART is not restorative of human nature: it does not prolong life or restore anything lost to disease or injury such as homeostasis or organ function. Treating a disease state such as cardiovascular disease restores the body's natural functions. The treatments might be artificial (nitroglycerin, vasopressors etc.), but the intention is restoration. This argument has been used in state cases and insurance company refusals. Contrary to this is the right *to* parent; the parental rights amendment offers liberty to direct the upbringing, education and care of an existing child.[33] However, in the United States for example, becoming pregnant is not a *right* guaranteed by the United States government,[34] and individual states retain a large degree of discretion to legislate the extent of reproductive freedom.

Some countries do consider the ability to become pregnant as a right ensured by the government, and some, for example Israel and France, provide funding for ART.[35] Eligibility for the use of ART varies by country. A recent international survey identified countries requiring 'stable heterosexual relationships' in order to use ART. Colombia is one country where the use of ART is not permitted by single women or men, or by same-sex couples. Romania allows single people to use ART, but not same-sex couples. Argentina, Barbados, Chile, Columbia, Ecuador, Finland, Greece, Guatemala, Israel, Nigeria, Panama, Peru and the U.K. specifically outlaw the use of ART by transgender individuals.[36] As certain forms of ART (namely surrogacy and gamete donation) are not legal in some countries, some countries endorse the position that physicians can ethically assist patients interested in cross-border reproductive care.[37] The ethical argument made in this case is that a physician's first duty is to provide care for a patient, and such duty trumps the prima facie concept of law evasion.

The ESHRE task force addresses 'non-standard' situations and relationships stating that gay, bisexual and 'transsexual' couples should not be denied access to ART in any form. Specifically, they state that:

> *Categorically denying access to any of these groups cannot be reconciled with a human rights perspective. If there are concerns about the implications of assisted reproduction on the wellbeing of any of the persons involved, including the future child, a surrogate mother or the applicants themselves, these concerns have to be considered in the light of the available scientific evidence. When doing so it is important to avoid the use of double standards.*[38]

While the use of ART may be regulated in some countries and financial considerations may put ART out of reach for many people, there are less invasive and less expensive ways to have a genetic child, if such means to parenthood are morally and personally acceptable to the individual. For single cisgender females or coupled lesbians, donor sperm can be used to achieve pregnancy. This can be done through artificial insemination, and the single woman or one partner of the lesbian couple can carry the pregnancy. Another form of parenthood used by lesbian couples is reciprocal IVF. In these cases, the oocytes from one partner are retrieved, fertilized with donor sperm, and implanted into the uterus of the other partner. This allows both partners to participate in the biological parenthood of the fetus.

For people who identify as transgender or non-binary, the option of natural conception still exists for those who have not had genital surgeries. There are multiple cases of 'pregnant men', namely transgender men who have retained their uterus, ovaries and fallopian tubes, refrained from gender-affirming hormones either prior to or upon discovery of the pregnancy, and conceived a child through sexual intercourse with a person who makes sperm.[39] In fact, unintended pregnancies have also occurred in this population, probably due to the misperception that testosterone renders one sterile. Transgender women who are taking gender-affirming oestrogen are more likely than transgender men to be sterile while on hormones, but this is not always the case.[40] Transgender women have unintentionally impregnated cisgender women as well as created intentional pregnancies by pausing hormone use. The majority of pregnancies involving a transgender parent have resulted in healthy newborns.[41]

5.2 | Surrogacy

Options for family building include the use of ART and a gestational carrier or surrogate. Most countries allowing surrogacy require that the embryo to be carried should come from gametes

[32] Pennings, G., de Wert, G., Shenfield, F., Cohen, J., Tarlatzis, B., & Devroey, P. (2007). ESHRE Task Force on Ethics and Law 13: The welfare of the child in medically assisted reproduction. *Human Reproduction*, *22*(10), 2585–2588.

[33] Gheaus, A. (2016). The right to parent and duties concerning future generations. *Journal of Political Philosophy*, *24*(4), 487–508.

[34] Reproductive freedom and the right to choose, up counsel. Retrieved from https://www.upcounsel/lect-reproductive-freedom-and-the-right-to-choose-a-fundamental-right [accessed Apr 2, 2019].

[35] International Federation of Fertility Societies (2016). IFFS Surveillance 2016. *Global Reproductive Health*, *1*, 1–143.

[36] Ibid.

[37] Van Hoof, W., Pennings, G., & De Sutter, P. (2016). Cross-border reproductive care for law evasion: Should physicians be allowed to help infertility patients evade the law of their own country? *European Journal of Obstetrics & Gynecology and Reproductive Biology*, *202*, 101–105.

[38] Pennings et al., op. cit. note 32, p. 2588.

[39] Charter, R., Ussher, J. M., Perz, J., & Robinson, K. (2018). The transgender parent: Experiences and constructions of pregnancy and parenthood for transgender men in Australia. *International Journal of Transgenderism*, *19*(1), 64–77.

[40] Mitu, K. (2016). Transgender reproductive choice and fertility preservation. *AMA Journal of Ethics*, *18*(11), 1119–1125.

[41] Mattawanon, N., Spencer, J. B., Schirmer, D. A., & Tangpricha, V. (2018). Fertility preservation options in transgender people: A review. *Reviews in Endocrine and Metabolic Disorders*, *19*(3), 231–242.

unrelated to the carrier. This requirement is meant to prevent the carrier from having any legal rights to the future child.[42] The ASRM has multiple indications for the use of gestational carriers, such as the intended parent needing to have a 'true medical condition' which represents a significant risk of death or harm to the 'woman' or future foetus.[43] The organization further requires that no one related to the clinic (owner, operator, or employee) may serve as a carrier. Intended genetic parents must receive psychosocial education, screening and genetic testing, and a physical examination looking for evidence of sexually transmitted disease, needle tracks indicating drug use, recent tattooing or piercing, oral thrush, spots consistent with Kaposi sarcoma, jaundice, scabs consistent with smallpox immunization, and certain forms of eczema. The ASRM has a unique requirement for the male partner, requiring an examination for evidence of anal intercourse and for evidence of perianal condylomata.

There are a host of requirements for the gestational carrier, including being within a specified age range, the provision of evidence of psychosocial support, and the requirement to undergo psychosocial evaluation, medical screening and laboratory tests. Nowhere in these guidelines is there a requirement for the future carrier to be a genetic female or to submit to an anal exam. There is no requirement for either the intended genetic parents or the surrogate to be legally married or heterosexual. The ESHRE has less stringent recommendations on surrogacy than the ASRM, even allowing surrogates to use their own oocytes. With the exception of payment, in that the ASRM sets no boundaries on financial payment to the surrogate and the ESHRE suggests that no payment should be made, the ESHRE is far more lenient in its guidelines. The ESHRE notes that there is little evidence and no long-term follow-up studies on the psychosocial consequences of surrogacy, either to the surrogate herself or to a child born from surrogacy. Specifically, the Society states that

> *No information is available for instance on the potential confusion about maternal roles. Long-term consequences if the surrogate woman keeps in contact with the resulting family have not been studied either. The possibility of conflicts cannot be excluded. Openness by the parents towards the child about its mode of conception is advisable. The wish of the child to know its genetic origin should be taken into consideration by the parents in cases where donor gametes or the oocyte of the surrogate have been used.*[44]

5.3 | Adoption

Another option for family building is adoption. While adoption is challenging and financially costly for all, there may be additional hurdles for certain groups of people. For example, cancer survivors, even if heterosexual and in a partnered/married relationship, are likely to experience delays or denial as a result of their health experience. There is limited empirical evidence specific to the attempts or desires of transgender individuals to adopt a child. Some evidence is available for lesbian and gay couples documenting the prejudice and bias experienced in the adoption process. One study in Europe interviewed 62 lesbian adoptive parents living in Belgium, France and Spain.[45] The results revealed that adoptive parents experienced numerous self-doubts and emotional conflicts driven by heteronormative assumptions about family from their own families as well as from adoption agencies. The adoption procedure brought a large number of challenges and legal roadblocks connected to their sexual minority status. The authors suggest the necessity of promoting practice geared not only to fighting discrimination but also to providing better support to lesbian and gay individuals throughout the adoption process.

Other research in the United States suggests that lesbian, gay and bisexual people have a history of experiencing prejudice in the adoption process. DeVault & Miller specify that laws in 'Mississippi and Utah prevent lesbian, gay and bisexual individuals from adopting, for fear they will not promote the same healthy outcomes as heterosexual parents'.[46] Researchers have addressed the fact that children raised in lesbian and gay families are often better adjusted than those raised in heterosexual or single-parent families.[47] Further evidence suggests that the adjustment of the child and the approach to parenting does not differ by sexual orientation.[48] In fact, one study showed that teens raised in lesbian households had better social competence and fewer social problems than teens reared in heterosexual families.[49] Despite laws and policies that make it difficult for lesbian, gay and bisexual couples to adopt, public support for adoption by lesbian, gay and bisexual couples appears to be slowly but steadily increasing.[50]

[42] Patel, N. H., Jadeja, Y. D., Bhadarka, H. K., Patel, M. N., Patel, N. H., & Sodagar, N. R. (2018). Insight into different aspects of surrogacy practices. *Journal of Human Reproductive Sciences*, *11*(3), 212–218.

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Several studies of transgender and gender-diverse adults indicate that adoption may be their 'first choice' for parenthood.[51] There are some adoption agencies and organizations that work exclusively with lesbian, gay, bisexual, transgender and questioning/queer prospective parents.[52] Despite advances in societal thinking about adoption in the sexual- and gender-minority community, adoption as a path to parenthood is still fraught with legal and social obstacles.

One agency described working with an adoptive family where the parents 'presented' as a cisgender heterosexual couple, yet one of the parents identified as transgender. Once the adoptive couple had been selected by a birth mother, the agency disclosed the 'additional' information that one of the parents identified as transgender, and the birth mother remained fully committed to the process, noting that she liked them for who they were and continuing with the adoption. Similarly, other agencies have noted the trend towards transgender and gender-diverse couples presenting as a heterosexual cisgender couple. This conundrum raises ethical questions about best practices for criteria for disclosure. Should couples be required to inform the agency or birth mother of their transgender status?

6 | ECTOGENESIS AS A STEP TOWARDS REPRODUCTIVE JUSTICE FOR SEXUAL AND GENDER MINORITIES

With increasing cultural acceptance of sexual- and gender-minority individuals, such as Obergefell vs. Hodge, in which marriage was recognized as a fundamental right for same-sex couples in the United States, the cultural meaning of family is shifting. For many, the growing cultural acceptance of broader conceptions of family is positive, even life-altering, as suggested by the decline in suicide rates among sexual- and gender-minority youth after Obergefell have been documented.[53]

This acceptance and the potential increase in the availability of ART for sexual- and gender-minority family building also challenges the notion of 'family of choice' that is an important facet of queer culture.[54] Scholars have cautioned against the privileged status of biogenetic procreation in contrast to queer definitions of family rooted in social ties, warning that this privileged status may further stigmatize 'alternative' methods of family building such as adoption.[55] However, Hull & Ortyle note that constructionist views remain important to sexual- and gender-minority communities, albeit with growing recognition of the importance of biological and legal family.[56] This may be due to cultural shifts in acceptance, resulting in more positive regard for one's biological family, as Riggs et al. found that, among transgender individuals, support from one's family was related to increased desire for parenthood.[57] We believe that scholarship on queer reproduction can inform the discourse on ectogenesis for all persons seeking biogenetic offspring, by offering a critical lens through which to examine the meaning of family, kinship, caregiving and parenthood (whether biogenetic or relational).

There are several areas that require more research and understanding, but this lack should not preclude sexual- and gender-minority individuals or families from building a family through ectogenesis or currently available ART methods. As a central consideration for access to ART, the welfare of the child is of high importance.[58] A growing body of research indicates that children from same-sex couples have outcomes that are equal to or better than those of children of heterosexual couples.[59] Less is known about transgender parenting and childhood outcomes, although there is no evidence that children of transgender parents would fare worse than children of cisgender parents merely because their parents identify as transgender. Denying transgender individuals the opportunity to build families with any ART method, present or future, would be to apply unnecessary limitations based on unfounded assumptions of parental fitness.

As policies for available ART, as well as for future technologies including ectogenesis, are in development and under consideration, a multilevel approach is necessary to prevent further stigma and to promote equity. Categorical exclusion from accessing ectogenesis for sexual- and gender-minority individuals would further stigmatize an already marginalized group. Arguably, the only inherent risk for the wellbeing of children of sexual- and gender-minority parents born through ectogenesis, above and beyond the risks faced by children of cisgender heterosexual parents, would be stigma-related. When policies for ART, including ectogenesis, are being drafted, we recommend the use of inclusive language with regard to the marital status, sexual orientation and gender

[51] Farr, R. H., & Goldberg, A. E. (2018). Sexual orientation, gender identity, and adoption law. *Family Court Review*, *56*(3), 374–383; Ducheny, K. M., & Ehrbar, R. D. (2016). Family creation options for transgender and gender nonconforming people. *Psychology of Sexual Orientation and Gender Diversity*, *3*(2), 173

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[55] Boucai, op. cit. note 33.

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identity of parents, as well as the inclusion of nondiscrimination policies based on sexual orientation and gender identity. Professionals and policy-makers should also recognize the history of gatekeeping in transgender medicine, in that psychotherapy is required prior to the medical transition of transgender individuals.[60] For example, recommendation for psychosocial screening should be based on predictive evidence of parental fitness and should be implemented for all potential parents, not selectively based on perceived risk associated with socially stigmatized demographics. At the individual level, reproductive health professionals should consider each case independently.[61] In light of historical gatekeeping and discrimination in medical settings, building a trusting patient–provider relationship is of utmost importance.

7 | CONCLUSION

Presently, these arguments are hypothetical at best, as full ectogenesis is far from being deemed safe and effective for use in humans, and there are many moral dimensions to its widespread use that warrant further discussion. However, if the science proceeds to the point that full ectogenesis may represent a feasible path to parenthood for individuals and couples who otherwise might not become parents, and if other moral and ethical dilemmas relating to the technology are sufficiently well resolved, we believe strongly that access to this technology should not be restricted to cisgender heterosexual individuals and that sexual and gender minorities should not be denied access solely on the basis of their sexual orientation or gender identities. In the meantime, more research is needed to support ethical, evidence-based criteria for access to family-building options, including ectogenesis. In the absence of definitive evidence linking the sexual- or gender-minority status of parents to an increased risk of harm to a child or children in their care, and consistent with the ESHRE task force's stance on ART, we believe that identity-based discrimination is unethical and represents a breach of widely accepted foundational tenets of social justice.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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[61] De Wert, op. cit. note 74.

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