

Biological clocks, biographical schedules and generational cycles: temporality in the ethics of assisted reproduction

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Abstract

In this paper, we aim to contribute to a more articulate, reflective and systematic understanding of the ethical significance of time and human temporality in the context of assisted reproductive technologies (ART). We first highlight the central role of time and temporality in the practices and regulatory frameworks of reproduction and ART. We then outline different levels of moral relevance of time and temporality in this context and examine their social origin and normative dimension, focusing on conceptions of reproductive, biographical and generational time. We draw conclusions for the debate on ART as well as for the conceptual framework of bioethical reasoning in general.

Keywords: (Moral relevance of) human temporality, assisted reproductive technologies (ART), reproductive time, biographical time, generational time, bioethical reasoning.

human existence are increasingly challenged and transformed, not least due to technological innovations. The following considerations are aimed to contribute to the development of a more articulate, systematic, and reflective understanding of the ethical significance of time and human temporality in the context of ART. We first highlight the central role of time and temporality in the practical processes and regulatory frameworks of reproduction and ART. We then outline different levels of moral relevance of time and temporality in this context and suggest ways of theoretically conceptualizing them from an ethical point of view, focusing on conceptions of reproductive, biographical and generational time. Finally, we draw conclusions for the bioethical debate on reproduction and ART as well as for bioethical reasoning in general.

Introduction

A few years ago, reports about a 65-year-old teacher who gave birth to quadruplets after oocyte donation and IVF attracted international attention and sparked debates about the technological and moral limits of reproductive medicine. Especially the mother's advanced age provoked moral outrage and public controversy. Thus, a German tabloid declared: "In a certain phase of life, most people think: 'It's enough.' At that point, one usually already finds one's way through life, passes on worldly wisdom to one's children, and takes care for the grandchildren" [1].

The case is significant in several respects: First, it illustrates that reproduction and assisted reproductive technologies (ART) have a lot to do with time and human temporality. They touch upon questions regarding the time of procreational processes or the temporal structure of life. Second, the ensuing outrage shows that the evaluation of reproduction and ART often rests on morally loaded understandings of time and temporality, e.g., regarding the normal, appropriate and desirable course of individual lives, the circumspect "timing" of life events or the proper sequence of generations. And finally, the example indicates that traditional temporal patterns, interpretations, and frameworks of

Background

Time plays a pivotal role in reproduction and reproductive medicine. Women's fertility is characterized by a menstrual cycle and repetitive rhythm [2]. The process of procreation itself seems to have its own inner temporal order and logic comprising a sequence of consecutive steps from conception to fusion as well as the ensuing stages of embryogenesis. Finally, the common metaphor of the "biological clock" highlights ideas about the biological limitation and finality of female fertility [3–5].

In practice, the perception of a specific closed time-frame for reproduction is decisive for the definition of risk pregnancies which implies higher risks for both maternal and fetal health as well as pregnancy and birth complications associated with advanced maternal age [6]. The identification of potential risk pregnancies, which results in more intensive medical supervision of pregnant women over 35, is based on a notion of medical risk accumulating over a lifetime. Temporality is also present in the medical management of reproduction, e.g., in timeslots and time schedules dictated by the temporal logic of obstetrics' practice, including the usage of weeks to reckon pregnancy time and standard schedules of tests during pregnancy [7]. These temporal aspects are particularly salient in practices of assisted reproduction. While ART were initially

aimed at treating and overcoming infertility, nowadays such technologies are also increasingly used to control the biology of fertility and its temporal characteristics [8]. Since its introduction in the 1970s, IVF became the first technology to offer some method of fertility prolongation [8]. More recent developments such as cryofertility technologies (i.e., vitrification or fast freezing) introduced the practice of Social Egg Freezing (SEF) which enables healthy women to disconnect their reproductive potential from its biological timeline. Furthermore, IVF treatments usually take place in cycles synchronized with the woman's menstrual cycles. They thus take the form of cyclic repetition while at the same time inducing the production of ovarian follicle and egg cells through hormonal treatment [2].

Socio-empirical research in the context of reproduction demonstrates the moral relevance of temporality. Such studies analyze moral attitudes with regard to temporality, e.g., in relation to reproductive timing and the legitimacy of motherhood at advanced age [4, 9]. Similar attitudes can also be recognized in view of SEF [10]. Other studies focus on the moral assessment of time "banking" as reflected in experiences of SEF users and their management and reconciliation of different types of temporalities (i.e., the time scale of their reproductive biology, the transformation of the life course and the iterative structures of relationship formation and career patterns) [8].

Temporality also plays a crucial role in regulatory frameworks of ART. National laws often limit the usage or funding of such medical procedures to certain ages. Thus, in many countries, the regulation of IVF eligibility and public health insurance coverage are based on chronological age limits. The Netherlands set the age of 45 as the limit for women's use of IVF. Germany determines that in order to receive partial public financing, the woman must be between 25 and 40 and the man between 25 and 50 [11, 12]. Furthermore, like many other countries, both Germany and the Netherlands also limit the number of covered treatment cycles (ibid.), thus taking the cyclical structure of female fertility as a temporal frame of reference for legal regulations. Regulatory age limits can also be found in the context of SEF. For example, Israel limits the eligibility of the procedure to women between 30 and 41 and permits the implementation of fertilized eggs until the age of 54 [13].

In addition, assumptions about the original formation and essential characteristics of human existence and its development over time play an important role. This holds true for debates on preimplantation or prenatal diagnosis and the underlying stages of gradual embryonic and fetal development with their specific attributes and potentials [14]. This understanding is also engrained in the perceptions of lay people [14] and seems to be influenced by cultural and religious scripts. Thus, while Catholicism assumes full moral status from the point of conception, the Jewish tradition and law

gradually grants the fetal entity its moral status according to defined stages of pregnancy, starting from the 40th day after fertilization (the moment of ensoulment) until birth [15]. Similar gradualist perceptions also exist in the Islam [16]. Such temporal perspectives are also reflected in legal regulations regarding pregnancy and abortion. Thus, many Western abortion laws are based on a perception of stages in pregnancy and restrict so-called "late abortion" [17].

Systematization of morally significant temporal dimensions in assisted reproduction

Time is a fundamental dimension of reproduction and ART. However, the relevant medical practices, ethical debates, and legal regulations frequently rest on implicit normative assumptions about adequate time and timing. Therefore, there is a need for a systematic overview of the role of time in ethical debates on ART. In what follows, we will outline and discuss the moral significance of temporality along three main dimensions: reproductive, biographical, and generational time.

Reproductive time: the "biological clock"

Debates about adequate reproductive timing are connected to notions of an inherent biological temporality of fertility and reproduction [18]. From this perspective, reproduction has its own intrinsic-somatic temporality and exists within a specific closed time frame. Thus, the metaphor of the "biological clock" encompasses concerns about (reproductive) ageing and the biological finality of women's reproduction [4, 5]. On the one hand, the image of the clock alludes to linear conceptions of time as an objective, infinite and measurable dimension. At the same time, it "constructs time as a continuum of successive checkpoints" [3, p. 53] like a stopwatch or an "hourglass" in which the sand is irreversibly trickling down. It thus also reflects ideas of time as scarce, unidirectional and terminable [19], as "fleeting", "ticking away" or "working against women" [3, 20].

In this context, ideas concerning the biology of fertility and age-related fertility decline involve the notion that there is a temporal "logic" to women's reproductive bodies [3] and therefore a "right" time for women to reproduce. Of course, these ideas are highly contested on the part of feminist scholars. According to Amir, the "biological clock" actually serves as a gendered temporal regulatory mechanism aimed at directing or foreclosing women's future possibilities in order to meet traditional familial narratives [3]. Others point out that the idea of a finality of fertility and reproduction has been primarily discussed with regard to women [10]. This shows a gender bias in the moral assessment of late motherhood and late fatherhood, especially in light of research on the role of reproductive time for male fertility associating advanced age of men with declining

conception rates, higher risks for pregnancy complications and health risks for future children [21].

Considerations regarding reproductive time and timing not only comprise the “biological temporality” of fertility but also its relation to contemporary regimes of “social time”. Zerubavel discusses the social transition from “natural time” based on natural rhythms to modern life’s “rational time” as a social “clock” or “standard” time [22, p. 19]. In this vein, temporal dimensions of reproductive time are also analyzed in the context of Western societies’ developments in the labor market (which requires higher flexibility, longer training periods and offers less occupational stability), the Post-Fordist two-wage family model and the resulting gendered work–family conflict [23–25]. In light of these changes, **the economic and emotional costs of reproduction have increased dramatically, leading (mainly middle-class) women to postponing or avoiding child-bearing** [23, 25]. **The issue of reproductive time thus can also be seen in the context of a critical view on modern civilization and a conflict between the finite existential logic of the allegedly “natural, biological time” and the alienating dynamics of newly evolving time regimes of modern technological and capitalist society which seem to disregard the feminine natural biological rhythm** [7].

By and large, there are two main approaches to “reproductive time”: “planning” and “kairos”. In the **“planning” strategy, the notion of “right time” is based on the assumption that reproduction is a matter of women’s control,** choice and responsibility [4, 5, 26, 27]. This perception follows the neo-liberal idea of self-determination emphasizing individual freedom of choice and personal responsibility [25]. In making reproductive decisions, women are expected to actively, prudently and responsibly manage and plan time, i.e., **control their present fertility in light of future prognoses and risks** (e.g., of ‘biological’ fertility decline), as well as to guarantee the health of future children [25, 28–31]. Several scholars have criticized this discourse of reproductive “choice” and “planning” [5, 26]. They highlight social inequalities affecting the ability to manage time (e.g., in the context of poverty, ethnic minorities and other underprivileged groups with limited access to ART, family planning and maternity care) [4]. Still, ART such as IVF, egg donation and SEF which offers women the possibility of post-menopausal reproduction are often seen as medical-technical solutions to overcome the limitations of the “biological clock” and reconcile “natural” and “social time” [8]. Indeed, it has been shown how **attempts to gain control over reproductive timing take the form of medicalization, not only by ART but also by contraceptives, home pregnancy testing and home “ovulation kits”** [4]. In this context, practices involving cryopreservation such as SEF and ovarian tissue freezing are perceived as manipulating time since they supposedly enable women to “stop the biological clock” or “freeze time”.

On the other hand, the idea of “right time” also brings to the fore the relevance of an alternative approach which is connected to the ancient concept of “kairos” and acknowledges an aspect of uncontrollable destiny. **“Kairos” is defined in terms of an experienced, flexible, qualitative time** [32, 33] and refers to timely situations in which we are able **to take the “right” actions by seizing a concrete opportunity which may not recur** [34]. The “right time” to have a child may therefore be perceived as a matter of luck, chance or fate and not by accumulative notions of chronological age. The idea of kairos may explain the tendency to delay parenthood as a general notion of “waiting for a right moment” to have a child. Such perception of “right time” may also be influenced by cultural factors and social expectations such as permanent employment, financial stability and marital relationships [9], ideas of emotional maturity or “readiness” to become a parent [26], and anticipation of availability for child rearing. This in turn may construct ART as means for pursuing one’s fate and catching the “right moment” for having children. From an ethical point of view, such issues of reproductive time need closer inspection. As we have seen, the image of the “biological clock” does not simply represent an original, natural order of time but a socially constructed and morally loaded temporality [3]. It may thus serve to ideologically conceal and “naturalize” socio-cultural standards and norms regarding reproduction that deserve critical examination and discussion. But even if we could separate a purely “natural temporality”, its implications for ethical considerations on reproduction and ART would not be self-evident. After all, **deriving normative consequences from natural facts would simply constitute a logical fallacy.** Either we presuppose a teleological understanding of nature suggesting that natural processes have their own intrinsic purposes and normativities that we must recognize. Or we explicitly introduce additional normative premises, e.g., certain individual or social purposes regarding reproduction, and formulate “hypothetical imperatives” defining biological-temporal conditions for their successful achievement.

Biographical time: the life course

Another moral dimension of human temporality relevant for the ethical debate on ART is the life course. Social research shows that individual life is not just a biological process but a **sequence of phases, thresholds, and trajectories structured by socio-cultural norms, each tied to a particular status and specific roles, expectations, and possibilities** [35]. Individuals appropriate this schematic course as a subjective frame of reference for value judgments, life decisions, and choices [35]. From an ethical perspective, three aspects structuring the life course appear particularly relevant: age norms, phase ideals, and biographical schedules [36]. Age norms are standards of **age-appropriate behavior** that determine which actions and lifestyles are consid-

ered appropriate or inappropriate, imperative, permissible or prohibited, commendable or reprehensible at a specific age or life stage [37]. Such age norms are exemplarily expressed when we tell a small child, a middle-aged adult, or an elderly person to “act their age” [38]. In the field of reproduction, procreation and parenthood of younger and older people are often problematized, albeit for different reasons [39, 40]. Young parenthood is often perceived as a sign of lacking maturity and responsibility that may affect the quality of child rearing. By contrast, **late parenthood is frequently framed as unnatural and egoistic** [41]. By suspending seemingly natural boundaries, ART such as SEF challenge traditional age norms, thereby revealing their genuinely normative character. Some observers point out that **these technologies might actually contribute to the transformation of established age norms**, e.g., by being employed by celebrities who provide new models for late motherhood [42]. Thus, on the one hand, the usage of ART reflects dimensions of control, empowerment and action as women have more freedom for planning and timing their reproduction due to the longer reproductive time span [43]. On the other hand, however, the usage of ART also involves risk and uncertainty regarding sufficient planning and perfect timing. **Social research shows that age norms are frequently gendered, prescribing different moral standards for men and women of the same age**. Against this backdrop, there have been critical discussions of the “double standard of ageing” [44]. Of course, from a medical point of view, the situation of older mothers and older fathers is fundamentally different, especially when we look at related medical risks and pregnancy complications. Nevertheless, it appears striking how much public moral uneasiness and scientific and ethical scrutiny focus on problematic aspects of older women becoming mothers, e.g., by means of SEF, often (over-)emphasizing the medical risks and neglecting positive aspects [10, 27]. **By contrast, becoming an older father is hardly investigated at all and widely seen as unproblematic – if not even as an admirable sign of enduring vitality and virility** [10, 45]. Such critique of SEF shows the persistence of particular social expectations towards women, motherhood, and the “ideal” female life course. It frames SEF as a deviance from collective temporal reproductive constructions. Such concerns have been criticized as representing unjust gendered stigmatization directed at “older” mothers as well as an adherence to abstract notions of “age” limitations while ignoring the actual individual physiological and fertility state [10].

A second life-course dimension in the evaluation of ART comprises phase ideals, that is, evaluative touchstones of a good life in the double sense of subjective happiness and objective flourishing. We usually hold different ideas of living well for different stages of life. A good childhood is associated with other notions of well-being and meaningful activities than adulthood

and old age. Becoming a parent too soon can appear as problematic for realizing a good life as becoming a parent too late in life [46]. Traditionally, having children was connected to the idea of a prime of life, a zenith or peak where all of a person’s capabilities and possibilities are developed to the fullest extent [47]. Of course, traditional phase ideals are becoming increasingly obsolete. Thus, while reproduction is often still considered a constitutive element of a good adult life, its preferable timing has become more variable [48]. In many Western societies, the increase in life expectancy has been accompanied by a prolongation of educational and training phases that has fostered the emergence of a “prolonged transition to adulthood” [49, p. 130]. While this extended timespan of personal and professional flexibility and experimentation is accompanied by existential uncertainties, it also corresponds to new ideas of self-discovery, self-evolution and self-realization that may suggest a postponement of parenthood [49]. New ART can be seen as instruments to facilitate this prolongation of adolescence and postponement of procreation [8]. Similar observations can be made with regard to the so-called “third age” which emerges as a new life phase after retirement with its own claims for self-realization and participation [47]. Furthermore, the succession of life phases also underlines the directionality and irreversibility of life. In the context of reproduction, this involves the notion of a risk of missed chances leading to regret. Indeed, **women’s motivations for using ART comprise the attempt to reduce anticipatory regret** [30]. This also explains the existential weight of considerations regarding reproduction and ART: Traditionally, the suitable time slot for reproduction appeared to be more or less strictly limited so that the realization of procreation and parenthood as essential elements of a good life was contingent upon prudent planning or simple luck. In consequence, new ART such as SEF evoke strong moral evaluations, be it as a way of increasing individual fulfilment or a problematic instrument for overcoming the limitations of the human condition [50].

A third class of morally relevant life course concepts in the context of reproductive medicine are biographical schedules and their milestones and deadlines. They refer to the diachronic aspect of life and the longitudinal co-ordination of life events and processes. Such schedules constitute an awareness of one’s temporal progress and situation in life, e.g., as being “on time” or “off time” [51]. The corresponding value judgments involve categories like “too early”, “too late” or “at the wrong point in time”. Biological reproduction seems to be a central focus of moral expectations regarding the right biographical timing and the appropriate point in life, as debates about premature or belated parenthood illustrate [52]. As shown by Perrier [26], while there is evidence of normative expectations of a “right time” for reproduction, in reality women are struggling to accommodate the expectation for taking active control

of their reproduction and their reproductive capacity. In practice, they are simultaneously faced with multiple facets of time, most prominently psycho-social time (i.e., ideas of emotional “readiness” for parenthood as well as biographical milestones concerning education, career and financial stability) and biological time which are often hard to reconcile [26]. In addition, certain sequences, durations, intervals or iterations of life events such as reproduction can appear commendable or blameworthy. Thus, having a child either before or too soon after marriage (or waiting too long with procreation) may cause particular concerns in certain social settings [53]. Biographical schedules also entail a strong gender dimension [3]. The constant attempts to bridge the world of paid work and family life characterize women’s biographies, leading them to develop special understandings of temporal aspects. According to Leccardi [28], due to the potentially contradictory nature of two temporal orders, young women tend to abandon the medium-long term future and concentrate on a time dimension termed the “extended present” [28, 54] in which they are able to make short-medium term plans mainly concerning their public activities. As part of this solution, European women tend to postpone their motherhood [55]. ART may serve as a medical-technological means to expand the extended present by postponing motherhood.

From an ethical point of view, the order of biographical time manifest in the life course deserves critical reflection. Although ideas of adequate biographical timing may refer to a presumed natural or biological order of life, social research shows that the life course and its concomitant measures of more or less adequate biographical timing are not simply natural facts but also socio-cultural constructs involving normative and evaluative standards that have to be made explicit and discussed. Thus, age norms that demand, allow or prohibit different kinds of reproductive behavior at different points in life raise genuinely normative claims that require an ethical justification. Similarly, phase ideals suggesting a different desirability and purposefulness of reproduction at different points in life express age-related ideals of a good life that need further ethical substantiation. The same holds true for biographical schedules framing reproductive decisions as “too soon” or “too late” or otherwise “off time”. In all three cases, the required arguments cannot only refer to descriptive assumptions about human development, its different stages and trajectories, and the accompanying needs, capacities and potentials. They also have to provide an ethical justification of the respective evaluative and normative standards involved.

Generational time: the social cycle

Time is never just a matter of individual importance. Especially when it comes to reproduction, the individual course of life with its biographical significance and normativity is interwoven with other lives, thus form-

ing a social fabric of collective time and temporality. This collective dimension becomes salient in the concept of generations and generationality: Passing through the phases of life, the individual at the same time traverses different generational roles and statuses. He or she is someone’s child, parent or grandparent. As an event in the individual life course, reproduction constitutes these generational relations and is at the same time subjected to their normative order. This central role at the intersection of the individual and collective process of life explains why reproduction and its social control and technological manipulation have always been a crucial concern for social groups and political communities. Ancient and medieval sources shed light on a variety of regulations regarding the adequate protagonists, combinations, and outcomes of reproductive processes [56]. Thus, Plato devised rules determining who was allowed to procreate with whom in order to generate the suitable population for the ideal state [56]. In a similar vein modern technological developments in the field of ART have rarely been considered a purely private matter. They are rather discussed as issues of tremendous public relevance and concern [57].

The same holds true for time and temporality in reproduction. Thus, social developments leading to shifts in the temporal order of procreation and parenthood have found considerable public attention and sparked controversial political debate. Apparently, the individual timing of reproduction has implications for the collective order, generational sequence, the continuity of the reproduction of society as a whole, as well as the overarching “chain of generations” and its normative underpinnings, e.g., of a generational contract comprising mutual claims and responsibilities over time. Again, especially the role of older women attracts attention and moral concern. Thus, the case of the aforementioned teacher not only exemplifies astonishment about an unusual life plan, but also moral irritation regarding the expected order of and responsibilities between generations. Common objections concern the biological and psychosocial quality of older parents’ offspring, the “reproductive outcome” [40], their ability to fulfil accustomed parental roles and responsibilities regarding upbringing and support [58], and the burdens created by early filial care responsibilities [59]. The evaluative and normative assumptions involved in these generational concerns are often hardly discussed and call for critical reflection.

Ultimately, the discussion of the adequate timing of reproduction also reveals fundamental normative presumptions about social, collective time that are rarely acknowledged. Thus, there is the powerful notion of a basic temporal directedness of society and socio-historical processes towards the future and future generations, a deeply rooted common conviction that the social “show must go on” and “the best is yet to come”. Some scholars even hypothesize that reproduction con-

stitutes a paradigmatic model for our common understanding of time itself as a continual, directed dimension connecting past, present and future. Only recently, the debate on “queer temporalities” has uncovered and challenged the underlying heteronormative prejudice in favor of the future as a continuation or perpetuation of past and present life [60]. Aging studies’ critical analyses of the ageist underpinnings of demographic debates and horror scenarios about stagnant and moribund “aging societies” lacking creativity, innovation and renewal point in a similar direction [61]. A corresponding line of criticism may be anticipated in the context of SEF. A study on the Israeli case revealed that changes in IVF policy (i.e., making IVF more accessible) led **women to delay starting families [62]. In consequence, it was claimed that the postponement of motherhood due to ART could result in an overall stagnation of birth rates and thus a decline of population numbers, especially in light of overestimated success rates and underestimated risks of ART [62].**

From an ethical viewpoint, the collective order of time does not simply represent some natural, e.g., evolutionary, chain of generations. It involves normative assumptions regarding the basic order and welfare of social collectives and touches upon basic theoretical questions: Apart from the (bio-)political interest of collectives in their own self-preservation or growth, why is it ethically important that collective reproduction takes a particular form and temporal order, including intergenerational commitments and responsibilities? Or that it even takes place at all? Can we actually speak of a self-evident moral imperative that mankind must (continue to) exist as Jonas suggested [63]? These questions give rise to fundamental ethical, political and metaphysical considerations regarding the basic structure of society, the continuity of history or ultimately the directedness of the universal process of life itself.

Discussion and Outlook

The central role of time and temporality in the ethical discussion of ART has long been neglected. Many of our ideas and practices in the context of reproduction are interwoven with and shaped by implicit standards and frameworks regarding biological, individual biographical, and collective genealogical processes. An adequate discussion of assisted reproduction requires a systematic empirical inventory and analysis as well as a profound ethical reflection of these temporal standards and frameworks.

The first task of ethical analysis is to penetrate the “naturalized” objectivity of the temporal structures of reproduction and reveal their social origin and normative dimension. It thus brings to the fore implicit moral assumptions that should be acknowledged and scrutinized. However, the question also is how such assumptions can be discussed in order to criticize or justify

them. An important starting point is to acknowledge that they are not just a matter of autonomous individual choice. The perspective needs to be broadened to the socio-political and cultural context (i.e., unveiling mechanism of biopolitics or in the context of freezing technologies “cryopolitics” [31, 64]). Thus, there are different expert debates on SEF in different nations [57]. While the Israeli National Bioethics Council (2009) views age-related fertility decline as a medical problem and SEF as “preventive medicine” [65], Swiss concerns focus on social changes through postponed motherhood and the potential abuse of ART [57].

Furthermore, the aspect of gender plays an important part when thinking about moral implications of time and temporality. Apparently, we apply different temporal standards to men and women in the context of reproduction, i.e., gendered understandings of temporal conflicts and the multiplicity of life-times [28, 54, 55]. They highlight the connection between women’s biographies, the labor-related time allocation conflict between work and family life, and reproductive decisions [28, 66]. **The existence of these gender differences is not to be mistaken as a simple manifestation of biological differences. It involves social stereotypes and potentially discriminatory power-dynamics that need critical examination [10]. At the same time, the usage of ART (e.g., social egg freezing) as a “solution” for solving gendered time conflicts should also be critically reflected in light of the medicalization of women’s reproduction and male-centered models of ideal participation in the labor force [67, 68].**

Finally, it appears plausible that normative conceptions of time and temporality not only impinge on bioethical debates about reproduction and ART but also play an important role in other medical contexts. We just need to think of processes such as chronic illness, ageing, and dying, as well as of medical and healthcare practices such as prevention, withdrawal of treatment, or resource allocation. In all these contexts, we need to ask what underlying temporal models and standards tacitly shape our respective understandings and evaluations. For example, **what notions of proper timing and the human life course inform our views on medical futility and the termination of treatment in old age? And what ideas of generational relations and responsibilities shape our attitudes regarding proxy decision making or resource allocation and rationing in healthcare? Whenever physical processes or human life as such are presumed to be structured into specific segments or whenever certain images of life phases with associated needs, priorities, rights, and responsibilities are at stake, the underlying temporal assumptions deserve closer examination in order to foster an open debate on their significance and justification.**

Of course, the ethical questions addressed in this paper are first and foremost located on a theoretical level. It presents a critical analysis of contemporary bioethical discourses on reproduction and ART in view of implicit

normative assumptions regarding reproductive timing, the life course and generational cycles. The primary aim is to contribute to a more articulate, reflective and systematic understanding of the ethical significance of time and human temporality in this context. To this end, we provide a conceptual framework characterizing central long neglected aspects of the moral relevance of time and temporality in the ethics of assisted reproduction. In addition, we also propose theoretical approaches to discuss these moral aspects of time and temporality from an ethical point of view. Nevertheless, there may also be quite concrete practical consequences for medicine and healthcare. Thus, it appears advisable to be much more suspicious regarding practices and regulations that are based on purely chronological thresholds and benchmarks, e.g., specific age limits for the use of ART. Such numerical parameters may appear objective, measurable and operationalizable. However, as our analysis indicates, they frequently stand in for much more complex assumptions and controversial moral convictions that require thorough theoretical reflection, empirical examination and ethical discussion.

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Zusammenfassung

Dieser Artikel versteht sich als Beitrag zu einer ausdrücklichen, reflektierten und systematischen Verständigung über die ethische Bedeutung von Zeit und menschlicher Zeitlichkeit im Kontext assistierter Reproduktion. Er beleuchtet zunächst schlaglichtartig die zentrale Rolle von Zeit und Zeitlichkeit in praktischen Handlungszusammenhängen und rechtlichen Rahmenbedingungen der (technisch assistierten) Reproduktion. Daraufhin werden drei Ebenen der moralischen Relevanz von Zeit und Zeitlichkeit unterschieden und im Hinblick auf ihre sozialen Hintergründe und normativen Dimensionen untersucht: reproduktive Zeit, biographische Zeit und generationelle Zeit. Wir ziehen Schlussfolgerungen für die ethische Debatte über technisch assistierte Reproduktion sowie für den begrifflichen Rahmen ethischer Theoriebildung im Allgemeinen.

Schlagnote: (Moralische Relevanz) menschlicher Zeitlichkeit, assistierte Reproduktionstechnologien (ART), reproduktive Zeit, biographische Zeit, generationelle Zeit, Bioethik.

Résumé

Dans cet article, nous voulons contribuer à une compréhension plus articulée, réfléchie et systématique de la signification éthique du temps et de la temporalité humaine dans le contexte des technologies de procréation assistée (TPA). Nous soulignons tout d'abord le rôle central du temps et de la temporalité dans les pratiques et les cadres réglementaires de la reproduction et des TPA. Nous soulignons ensuite les différents niveaux de pertinence morale du temps et de la temporalité dans ce contexte et examinons leur origine sociale et leur dimension normative, en nous concentrant sur les conceptions du temps reproductif, biographique et générationnel. Nous tirons des conclusions pour le débat sur les TPA ainsi que pour le cadre conceptuel du raisonnement bioéthique en général.

Mots clés: (Pertinence morale de) la temporalité humaine, procréations médicalement assistées (PMA), temporalité reproductive, temporalité biographique, temporalité générationnelle, raisonnement bioéthique.

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