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Adopting an ‘unlearner’ technology? Knowledge battles over pharmaceutical pain relief in childbirth in post-1968 France

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Abstract With a national rate of 82.4%, France is currently one of the world’s leading users of epidural analgesia (EA), which is promoted not just as a pain reliever but also as a technology that makes childbirth safer. Drawing on analytical tools from science and technology studies, reproductive studies and ignorance studies, I will show how this obstetric drug came to be widely used after significant knowledge/ignorance battles had been fought during heated public and medical controversy in the 1970s. Different visions of the ‘knowns’, the ‘unknowns’ and ‘know-how’ came into conflict in this context, supported by a series of moral, political and feminist justifications that were often at odds with one another. While the defenders of natural birth clashed with feminists, created ambiguities around conceptions of the maternal body, and struggled to produce large-scale clinical knowledge on the risks of EA, the defenders of EA put forward technological promises and biomedical modernization as a means to outstrip the knowledge wars. In the aftermath of this epistemic battle, EA was to gradually become an ‘unlearner’ technology; that is, a modern tool that radically silenced the maternal body and led to denial, disregard or unawareness of a whole range of shared and alternative knowledges and ‘know-how’ relating to female physiology and the birth process that are free of pharmaceutical products and medical interventions. 

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Introduction

Since the mid-20th century, childbirth has undergone a profound transformation worldwide, with the shift in focus from the home to the hospital, and the expanding recourse to obstetric technologies and pharmaceutical products in the management of birth risk and pain (Davis-Floyd and Sargent, 1997; De Vries et al., 2001; Topçu and Brown, 2019). The technologization of birth movement has been so huge in some contexts that the World Health Organization (WHO) was prompted to highlight the need to regulate the 'problem' in 1985, which presented in different forms in different national contexts (WHO, 1985). For the last decade or two, countries such as Brazil, the USA and Turkey have been faced with a 'caesarean epidemic' (Morris, 2013; Topçu, 2019), while in France and Quebec, the regulation of what might be called an 'epidural epidemic' has become a problem of national public concern.

According to the most recent official data, 82.4% of births in France involve the use of epidural analgesia (EA) (Enquête nationale périnatale, 2016). EA was introduced into French maternity services in 1972. While at national level, its use was still marginal in the early 1980s, it had already become the norm in several large Parisian maternity hospitals. For instance, in Hôpital Pitié-Salpêtrière, the EA rate increased from 0% in 1974 to 65% in 1980 (Jaubert, 1982: 205). Over time, this disparity in the use of EA between the large, prestigious hospitals and the more common maternity units was to disappear. The proliferation of EA accelerated in the late 1980s, and by 1995, the national rate had reached 48.6% (Blondel et al., 2012: 136). During the same period, criticisms began to emerge regarding the routinization of EA as unjustified medicalization, and there was a call for the creation of birth centres, which do not offer EA. In more recent times, EA has become one of the areas targeted in feminist denunciations of 'obstetric violence', which became a public issue in France in the summer of 2017 and remains so today (Dechalotte, 2017; Lahaye, 2018). Feminists claim that EA is used as a means of oppressing women and their bodies in order to better rationalize obstetric care. They also condemn its side, or 'snowball', effects. In parallel, they highlight the empowerment that EA-free deliveries provide. Stories of women giving birth without EA have proliferated on the Internet, and have been communicated by the press as an 'incredible adventure' (La Rédaction de Parents, 2019). [Unless otherwise indicated, all quotations from French sources have been translated into English. I have also provided English translations of the French primary source titles (books, reports, press articles), either in the article or in the reference section.]

Criticism of EA is still fairly 'low key' within the current movement that is opposed to obstetric violence and in favour of physiological birth. The term 'physiological birth' is now more widely mobilized than labels referring to nature (e.g. 'natural birth'), which are still a source of tension within French feminism (Faircloth, 2015). The advocates of physiological birth see direct opposition to EA as a risky strategy because it could irritate both the consumers and the defenders of women's right to pain relief. Instead, they highlight the fact that EA needs to remain a choice and not

an injunction – a problem that has recently been rendered visible by the findings of a number of surveys which have shown that a large proportion of women requesting an EA-free birth have ultimately given birth under EA (Kpea et al., 2015; Enquête nationale périnatale, 2016: 115). Significantly, a recent government report on gynaecological and obstetric violence notes that while EA is a progressive intervention for women, it can also present an obstacle for those who seek alternative or physiological birth methods (Haut Conseil à l'Égalité entre les Femmes et les Hommes, 2018). Béatrice Blondel, a well-known epidemiologist, is often cited in this context. She maintains that EA has contributed to relieving pain in an efficient manner, and has improved safety by reducing the risk of recourse to general anaesthesia in the event of a complicated labour (Haut Conseil à l'Égalité entre les Femmes et les Hommes, 2018: 87).

The French medical discourse over the last few decades has been shaped by minimization of the iatrogenic effects of EA and assertions of its purported benefits in risk management. Obstetricians/gynaecologists (OB-GYN) and midwives have touted the advantages of EA through at least three types of safety-centred arguments, which have also been mobilized in other western countries where EA is used frequently (Newnham et al., 2018; Wolf, 2009). They have promoted it as a means to reduce time spent in labour, as a way to prevent fetal distress and as a safe alternative to 'risky' general anaesthesia in the event of an instrumental delivery or caesarean section (an argument that was already strong in the 1970s) (Carricaburu, 2005: 254–255). The (rare) risks that EA presents to women (e.g. paralysis) and its side effects (e.g. back pain and headaches) have been filed away under the 'unknown' or 'uncertain' categories by health professionals. A recent ethnographic study conducted in a maternity hospital in the Paris region revealed how anaesthetists and midwives (who manage the majority of vaginal births in France) were making strategic or performative use of uncertainty. When the women reported backache after giving birth under EA at this hospital, the medical staff shrugged off their complaints as irrational beliefs. The anaesthetists claimed that there was no evidence for such a causal link (Quagliariello and Topçu, forthcoming). Just as in the Vioxx scandal (McGoey, 2009) and other pharmaceutical controversies (Abraham, 1995), not to mention the controversy over the fallout from the Chernobyl accident in the UK (Wynne, 1996), the experts were consolidating their own authority by drawing attention to incomplete knowledge. Furthermore, by labelling certain events or situations as 'uncertain', they were fostering the very uncertainties they were highlighting while simultaneously shielding themselves from blame, because it is difficult to prove that someone is more certain about something than they are alleging (McGoey, 2009).

During the technology's early phase in the 1970s and 1980s, however, these risks, as well as those that were subsequently completely silenced (e.g. the risks to the fetus), were the subject of medical controversy. The way in which EA was to completely transform childbirth and lead to loss of the traditional knowledge of the birth attendant was also widely debated. An epistemological battle was waged by the natural birth promoters over the need not just to exploit the knowledge (or 'knowns') provided by nature but also to

search for the 'unknowns' regarding the risks and side effects of EA, and to preserve 'know-how' (i.e. the ways of giving birth without drugs that had been passed down through the generations). In this article, I propose to focus on this controversy. I aim to show that the normalization of EA was historically based on the following three-fold strategy deployed by its promoters: a rejection or discrediting of the 'knowns' (or natural knowledge) as pseudo-science; an unlearning of 'know-how' (i.e. 'natural' birth or birth with few interventions) in the name of safety; and an acknowledgement and maintenance of the 'unknowns' concerning the risks and side effects of EA with the promise that they would disappear as the technology improved. This three-fold strategy was deployed amid fierce public and medical controversy in which different visions of the 'knowns' and 'unknowns' came into conflict, and where competing moral (e.g. medical responsibility versus irresponsibility; violence versus non-violence), political (e.g. faith in science or faith in nature; technologism versus ecologism) and feminist (e.g. women's empowerment versus oppression) justifications were put forward. This strategy gradually came to constitute what I propose to call 'technology-driven ignorance', which has extended far beyond just the case of EA to shape modern obstetrics to different degrees and under different forms more generally (Sarda, 2011; Topçu, 2019). By technology-driven ignorance, I mean the new knowledges, practices and 'know-how' that are generated by a technical innovation and that concern ways of living with or dealing with a given biological or ecological context. This type of movement is based on a set of mechanisms that consist of ignoring or unlearning previous or alternative ways or regimes of knowing and doing that are (or were) not centred on technology, which are then eliminated or pushed aside as a result. Technology-driven ignorance is, of course, not specific to childbirth or to EA. Indeed, the history of industrialization provides many examples. The assembly line, for instance, eradicated artisanal ways of manufacturing. Machines, pesticides and chemical fertilizers 'revolutionized' agriculture. The automobile radically transformed ways of travelling from A to B and making use of space. Antibiotics and drugs subverted traditional breeding. Each of these innovations, products and machines introduced its own dynamic of knowledge/ignorance production depending on its material properties (Mitchell, 2011), and the characteristics of the contexts with which it interacted and transformed. These contexts comprised ecological environments, biological bodies and social agents, such as the users and consumers, who more often than not participated in shaping these innovations (Kline and Pinch, 1996).

The EA innovation that I propose to discuss here has its own specificities regarding how, in countries such as France, it gradually imposed itself as an ignorance producer, or 'unlearner' technology; that is to say, a modern tool that, on the one hand, instantly silenced the maternal body and, on the other hand, led in the middle and long terms to a disregard or unawareness of a whole range of shared and alternative knowledges and 'know-how' relating to the female physiology and birth process that were free of pharmaceutical products and medical interventions. The use of the notion of 'unlearner' here is intended to emphasize the part that this technology played in the 'forgetting' or 'no longer

knowing' process with regard to previous or alternative ways of doing or practising. It played this 'unlearner' role in two ways: (i) intrinsically, because it materially substituted for something else, which inevitably gave rise to new organizations, practices and habits; and (ii) actively, through the political work carried out by its promoters.

The process of unlearning is often distributed over time. It expands as the new technology progressively diffuses, and is fully achieved once the technology becomes generalized or even monopolistic. Additionally, the pace of unlearning is almost certainly correlated with a wide range of factors, including users' attitudes, regulatory changes, the efficiency of the strategies employed by the defenders of the technology in question to refute or discredit previous or rivaling knowledges or 'know-how', and the level or intensity of the debates or controversies over the advantages and disadvantages of the proposed innovation and its alternatives (i.e. media coverage, activists' campaigns and lobbying, etc.). Finally, the people who 'unlearn' or 'forget' are often a more heterogeneous group (e.g. technical/medical practitioners, users/patients, experts, policy makers) and therefore more difficult to circumscribe than those who promote the 'unlearner' technology.

In this paper, I will follow these lines of analysis to shed light, in particular, on the ways in which the defenders of EA dealt with the (alternative) knowledge and 'know-how' claims of its opponents. I begin by presenting a brief overview of the politics of obstetric care in post-May 1968 France, and of the medical and public controversy on medicalized childbirth in France in the second half of the 1970s. The EA controversy that I focus on took shape in this sociopolitical context. I next explore the different knowledge/ignorance frameworks of the three influential birth movements that were put forward in opposition to or in defence of EA. Finally, I focus my analysis on the feminist movement, which played an important role in shaping the EA controversy. The French feminists' relationship to issues of childbirth and maternity is an underinvestigated topic, so this article also aims to contribute to filling this gap.

The data for this study came from multiple sources, including: (i) a review of the general press, feminist press and medical press published during the period in question; (ii) interviews conducted with representatives of the different birth movements and the feminist movement; (iii) archive documents provided by the interviewees (especially from the Pithiviers and the Maternité Les Bluets maternity units); and (iv) audiovisual archives (from the Institut National d'Audiovisuel), namely television debates. It should be noted here that the media (both written and audiovisual) was a very important platform for the EA controversy discussed in this paper. The systematic follow-up of a large variety of media sources was therefore a de-facto choice for this analysis.

The politics of childbirth in post-May 1968 France

In the early 1970s, risk became a major performative tool for governing childbirth in France, which underwent a deep restructuring of its obstetric care as a result (Lamy, 1971). In the late 1960s, perinatal mortality in France was among

the highest in Europe, peaking at 23 per 1000 births (Carriacaburu, 2007: 125). Maternal mortality was also high and remained so until the late 1980s (Akrich and Pasveer, 1995: 25). In 1970, it was recorded at 28.2 per 100,000 births, which was almost three times higher than the rates observed in Northern European countries such as Sweden (Charrier and Clavandier, 2013: 89). In an attempt to combat these high perinatal and maternal mortality rates, a campaign was launched to standardize maternity units. This movement gained momentum following the Décret Dienesch in 1972. Based on the assumption that the larger the maternity unit, the safer it was, the number of maternity units shrank by 66% between 1975 and 2018 (DREES, 2020: 129–130). At the same time, there was an acceleration in the framing of childbirth as a pathological process requiring intense medicalization (Akrich and Pasveer, 1995), and the hospital birth setting was radically transformed by the introduction of technical surveillance and intervention systems and equipment. While the use of ultrasounds, monitoring devices, perfusion and oxytocin had already become widespread by the late 1970s/early 1980s, the uptake of EA was slower (Charrier and Clavandier, 2013: 113–124).

From the mid-1970s to the early 1980s, only a few hospitals in Paris and some other large cities offered EA. Moreover, only a small number of French anaesthetists were trained to administer EA during this period (Nau, 1980b; Vuille, 2015: 53). As a result, by 1981, the EA birth rate was only 4% in France compared with 22% in the USA (Vuille, 2015: 52), where the forerunner of EA had first appeared in the late 1930s and had been adopted immediately by some American maternity hospitals (Wolf, 2009: 78). OB-GYN in the USA hoped that EA would replace the existing alternatives, such as ether (introduced as a childbirth anaesthetic in the USA in the mid-19th century), chloroform (first administered in the UK in the same period) and the scopolamine/morphine combination (known as the 'twilight sleep method') developed in Germany in the 1910s. The dangers of each of these anaesthetic options were acknowledged in the 1920s. Chloroform could cause postpartum haemorrhage and damage the heart and liver. Ether could result in haemorrhage, irritate the mother's lungs, damage the mother's kidneys, slow the contractions and asphyxiate the baby. The twilight sleep method could depress fetal respiration and cause maternal delirium, as well as maternal and infant death (Wolf, 2009: 67–96). However, by the 1940s, there were also growing concerns over the safety of EA. A significant number of physicians in the USA associated it with infection, postpartum headaches, paralysis of the motor nerves, a decrease in maternal blood pressure and an increase in forceps deliveries (Wolf, 2009: 98). While these concerns did not disappear, the systematization of medicalized protocols in the 1950s and 1960s (with full drug protocols becoming the norm) to better manage the high volume of 'baby boomer' births facilitated the progressive recourse to EA in American maternity hospitals during this period (Wolf, 2009: 105–135).

The fact that France did not then follow suit was due to several factors. First, the shift of childbirth from the home to the hospital (which is the setting required for EA administration) was delayed in France compared with the USA. While the number of hospital births overtook that of home births in the USA in the late 1930s, this did not happen in France until

the 1950s. The USA recorded 95% hospital births in 1955 (Wolf, 2009: 77) compared with 53% in France in 1952. A decade later, however, this rate had jumped to 85% in France (Charrier and Clavandier, 2013: 105). Second, partly as a consequence of the above-mentioned early alerts about the dangers of anaesthetic drugs and partly because there had been a number of accidents in French maternity hospitals due to these drugs (i.e. chloroform, ether) in the 1950s and 1960s (La Rédaction du Monde, 1951, 1965), some French obstetricians and hospitals were reluctant to experiment with and use pharmaceutical anaesthetics. Instead, they opted to tackle labour pain using psychocognitive approaches, such as the Lamaze method, which served as an alternative to pharmaceutical pain relief during the 1950s and 1960s (Vuille, 2015). The third factor was that there was no mass mobilization of women in France to reclaim anaesthetic care in the first three-quarters of the 20th century, unlike in the USA, where women had launched mass media campaigns as early as the 1920s to reclaim generalization of the twilight sleep method in particular (Wolf, 2009: 58–72).

Despite its slow implementation, however, the introduction of EA into France quickly gave rise to multiple reactions, as did the subsequent intensive restructuring of the obstetric care system more broadly. New concerns over the risk of transforming the birth process into an emergency case conflicted with political and medical concerns over the obstetric causes of maternal and infant mortality and disability. This led to the rise of a national controversy, which originated among mainly male OB-GYN, over the pros and cons of medicalized childbirth in the mid-1970s. The revival – on the initiative of men – of alternative birth movements, which had been developing since the 1950s, played an important role in this context. In particular, publication of the obstetrician Frédéric Leboyer's bestselling book *Pour une naissance sans violence* (For a birth without violence) in 1974 marked a turning point. Tens of thousands of copies were sold within a few months, and the book was translated into 13 languages. Hence, three different birth doctrines gradually entered into competition with one another: 'birth without risk' (advocated by the representatives of scientific obstetrics, who were mainly prominent OB-GYN based in Paris); 'birth without violence' (advocated by Leboyer and Odent); and 'birth without pain' (the Lamaze method), which had been promoted in the 1950s and updated in the 1970s. Each of these doctrines put forward different and sometimes ambiguous conceptions of the science and art of childbirth, as will be shown below.

Overall, the categories of science, knowledge, ignorance, risk and violence were central to the discursive regimes of justification mobilized by the different, mainly male actors in the controversy. Elsewhere (e.g. in the USA) during this same period, the debate and controversy over medicalized childbirth were much less male-dominated. The fact that midwives were excluded from the obstetric system in the USA, where OB-GYN had dominated since the 1920s (unlike in France), catalysed the American feminist movement's problematization of the need for women to take the matter of childbirth into their own hands, including through alliances with the movement of 'lay midwives' who emerged in the late 1960s and promoted natural and home births (Ehrenreich and English, 1973; Kline, 2018; Wolf, 2009).

The French controversy over EA more specifically was fuelled by polarized representations of the drug with regard to its technical and material properties, its promises and its risks. While some of its protagonists presented it as an everyday local intervention (Sarraute, 1977), others claimed it was a technological 'miracle', bringing comfort for women and safety for their babies (Boisel, 1975). Some doctors even claimed that 'The second we introduce EA, we begin to prepare the child's baccaulareate' (Aujourd'hui Madame, 1978). However, the opponents of EA within the medical arena feared that EA would disempower women, and lead not only to the loss of existing medical competencies, but also to deregulation of the birth process, because they believed that labour pains and women's responses (or 'cries') during childbirth had 'medical' functions (i.e. they helped to indicate the progression of labour) (Janov, 1970). These opponents also expressed concern about the potential iatrogenic effects of EA on the mother in particular, arguing that EA was a significant and risky intervention that should not be routinized (Cheynier, 1975). They were careful, however, not to overemphasize the medical risks to avoid credibilizing public fears that they considered to be exaggerated, such as those reflected in one journalist's comment during a television broadcast that many people were worried that EA would transform births into 'double deaths' (of the mother and the baby) (Aujourd'hui Madame, 1978). Medical journals and the mass media began to report on some EA-related incidents during this period, thus shifting the 'risks' from the 'unknown' or 'probable' to the 'real' category. One of the cases reported involved a 26-year-old woman who had given birth under EA in a maternity unit in Avignon in February 1976. Soon after delivery, she had suffered a pulmonary complication, septicaemia and acute renal failure, and ended up having her hand amputated because of a lack of blood circulation (Dr. Ph. L., 1979). Another case, 3 years later, involved a woman who had been given a caesarean section under EA and suffered severe neurological and motor disorders due to a sudden drop in blood pressure after the EA injection (La Rédaction du Monde, 1992).

On another level, both the protagonists and opponents of EA mainly described it as a medical act rather than as a drug. The criticality of the place where it was administered (i.e. the epidural space in the woman's back), the specificity of the instruments used (i.e. the needle and the catheter), the profile of the very few professionals that were allowed to practise it in France (i.e. specifically trained anaesthetists assisted by a whole medical team) and the fact that the patients could not self-administer played a role in the fact that EA was seen as more than a drug or pharmaceutical product. Paradoxically, however, doctors on both sides of the debate also often framed it as less than a drug because there was rarely any argument over the type or chemical composition of the anaesthetic substance injected. In addition, there was no proper discussion of EA's pharmaceutical effects on the female body as a whole. Instead, both the protagonists and the opponents of EA focused on the way it altered the birth process (i.e. making it calmer and safer or, conversely, more complicated) or on how the women's bodies functioned or reacted at specific stages of the birth process (e.g. when pushing). As will be discussed further below, only a few feminists openly questioned the way that EA modified women's bodies, created side effects and sensations (or loss of sensa-

tion), and even colonized the women's biology and psyche in the same way as contraceptive pills and other artificial or synthetic hormones.

'Birth without violence': the (ambiguous) power and knowledge of nature

The main idea behind Leboyer's 'birth without violence' movement was that the way in which a newborn comes into the world matters for the rest of their life. In particular, Leboyer launched an unexpected scientific controversy based on the following question: What do the fetus and the newborn know, and what are they capable of? Claiming that the fetus was aware of many things *in utero* during labour and during the first few seconds of life through their five senses, Leboyer suggested that they should come into the world in the least traumatic way possible (i.e. in a gentle, quiet and peaceful environment with minimal intervention). Influenced by pacifist movements and by Indian gurus such as Svami Prajnapad, Leboyer used his own traumatic birth experience (which he claimed he had recalled through psycho-analysis) to develop his theory of the 'sensible' and 'knowledgeable' fetus. He claimed that the fetus, or 'young traveller' (*jeune voyageur*), instinctively knew how to come into the world:

Yes, as wave pulls away from wave, this birth is born of the sea, yet it does not leave it. Do not touch it with your rough hands. You understand nothing of its mysteries. The child is coming. Let it come. It knows (Leboyer, 1974: 76) (the original version of the quotation is: 'Oui, cette naissance, cette vague qui se détache de la vague, naît de la mer sans la quitter, n'y touchez pas avec vos mains grossières. Vous n'entendez rien aux mystères. L'enfant en vient, laissez-le faire: il sait').

He argued that this 'adventurer' plays an active role in their own birth and in discovering the world that welcomes them (Leboyer, 1974: 102, 125). Leboyer's theory resonated with thousands of pregnant women and future parents, who read his work with enthusiasm and even posted adverts in the newspapers seeking maternity hospitals that used the Leboyer method (Morel, 2016).

Leboyer quit medical practice shortly after his publishing success. Michel Odent, a surgeon and Head of Maternity Services at the Hôpital de Pithiviers (located in the Centre-Val de Loire region) until the mid-1980s, promoted and put into practice similar approaches and methods. In particular, Odent innovated by transposing the idea of 'non-interventionism' to the labour process itself, which he claimed was the best way to make birth safe and non-violent. The labour rooms at Hôpital de Pithiviers were thus free of medical instruments. Renamed the 'salles sauvages' (wild rooms), their decor and lighting were kept simple, and there was enough space for women to opt for their preferred birth position. A few years later, Odent also introduced 'blue rooms' in the unit to accommodate water births. This innovation contributed to his international reputation and transformed the provincial Hôpital de Pithiviers's maternity unit into a facility that attracted women from all over France and beyond. The unit's annual birth rate consequently doubled (from 500 to 1000) in just a few years.

Odent was much more vocal than Leboyer in his call for the development of the science of the natural. Inspired by promoters of maternal bonding in the USA such as Marshall Klaus and John Kennell (Interview 1, 2020), he advocated the recognition or non-ignorance of the (unexploited) knowledge provided by human physiology in order to improve mothers' and babies' wellbeing both during and after birth. He also appealed for the production of epidemiological data on the impact of the birth experience on the whole life trajectory (physical and mental health issues), thus publicizing the problem of 'undone science' which Frickel et al. (2010: 445) defined as 'areas of research identified by social movements and other civil society organizations as having potentially broad social benefit that are left unfunded, incomplete, or generally ignored'. In Odent's view, nature (i.e. the female body and physiology) knew, had laws and made signals, and exploiting this knowledge could reshape the evolutionary future of humanity (Odent, 1976, 2013). A criticism of medicine was central to this view. The human species needed to be saved from (or survive) medical interventionism in order to progress in a more peaceful way. Odent also placed great emphasis in this context on natural versus artificial hormones (i.e. synthetic oxytocin). He claimed that the generalization of artificial hormones caused a deterioration in the mothers' and babies' physical and emotional health (e.g. attachment problems), while natural hormones regulated and made birth safe. Hence, in relation to birth pain, Odent contrasted endorphins with the epidural. He suggested that parturient women in a non-violent birth environment, where they felt comfortable and confident, would secrete endorphins, which acted as a natural morphine to reduce birth pain when good birthing conditions were provided.

This alternative science (and knowledge) of physiological birth that was promoted by the protagonists of 'birth without violence' placed little emphasis on midwives' traditional knowledge or on 'know-how' relating to a good birth process (i.e. the knowledge that women acquire when educated or supported to better manage their bodies). Instead, its advocates stressed the novel, or even revolutionary, nature of their method. In a television interview, Odent argued:

Of course, in a sense, we are revolutionaries, because seeking to change the way women give birth is the same in a way as seeking to change life itself (Visages du Centre, 1976).

They also adhered to essentialist representations of the female body and physiology, and ignored issues such as women's empowerment through childbirth. This had a major impact on the contemporary feminists' view of the movement. As will be discussed further below, the feminists rejected and even denounced natural, non-violent and ecological births as antifeminism and as a new form of patriarchy or sexism.

'Birth without pain' and the disputed power of 'know-how'

The importance of the learnt dimension of the birth process and its empowering potential for women were highlighted

by another competing alternative birth movement of the period called the 'birth without pain' movement (also known as 'psychoprophylactic birth' or the 'Lamaze method'), which had been launched by Ferdinand Lamaze in the 1950s at Maternité Les Bluets in Paris (Caron-Leulliez and George, 2004; Vuille, 2015), and which subsequently gained a worldwide following (Michaels, 2014). The sudden emergence of the debate on EA prompted an updated revival of the Lamaze method in France.

In the 1970s, the medical staff at Maternité Les Bluets, which was founded in 1947 by the communist trade union 'Confédération générale du travail', resisted the use of EA and renewed its own offer of pain relief and obstetric care through a more participatory, less top-down approach to birth (Interview 2, 2018). For instance, older children were allowed into the birth rooms if the mothers/parents wanted them there, and a wider range of birth positions was offered. The inheritors of the Lamaze method hoped such updates would valorize it as an alternative to EA, which they considered to be an illusory solution to the mother's fear of birth pain. They promoted it as a novel or innovative approach in the same way that the promoters of 'birth without violence' did, but, unlike the latter, they were also able to point to their 'revolutionary' method's two-decade-old heritage (Caron-Leulliez and George, 2004), and the fact that its wide diffusion through France in previous years had been based on approved and established knowledge.

In particular, Jean-Marie Cheynier, who was Head of the Maternity Unit at Maternité Les Bluets from 1964 to 1995, became one of the main detractors of EA during this period (Cheynier, 1985). He argued that it would be absurd to generalize EA without medical indication in the same way that it would be absurd to routinize general anaesthesia. He warned that EA technology risked disempowering women, and claimed that the Lamaze method genuinely allowed women to live their birth experience fully and thus empowered them. In other words, it was learning (i.e. preparation through birth exercises, etc.) rather than drugs, which made women passive, that was key to a healthy and painless birth (Cheynier, 1975). Cheynier also criticized the iatrogenic effects of EA. In several television broadcasts, he drew a parallel between EA and monitoring devices. He said that the caesarean section rates had doubled in his unit following the introduction of monitoring devices, while the mortality/morbidity levels had not necessarily improved. He warned against similar risks with EA (Aujourd'hui Madame, 1981). Just like the health professionals in Owens's (2017) study of resistance to continuous fetal monitoring devices in the USA, Cheynier and the 'birth without pain' defenders viewed less monitoring or non-monitoring as a moral imperative in good, or non-invasive, medicine. Instead of the surplus of knowledge, which they considered to be harmful, generated by electronic machines, they advocated 'intentional non-knowing' (Owens, 2017). With regard to EA, they believed the problem for both women and health professionals was linked to the drug's power to suppress the possibilities of sensation, self-control and thus knowledge in relation to the mother's body. In other words, they criticized monitoring devices for producing too much, and thus potentially harmful, knowledge (because this type of technical knowledge about the fetus's heart movements could cause panic and lead to emergency decisions that

were not always justified, such as recourse to caesarean section), and they criticized EA because it prevented the exploitation of (useful) knowledge produced by the women themselves; that is to say, the corporal knowledge that women could use to give birth without too much suffering and without the consumption of pharmaceutical products. From the point of view of the 'birth without pain' defenders, EA suppressed such corporal knowledge in an authoritative or machinistic way without providing any other knowledge in return.

Critics of the Lamaze method reinforced their opposition, arguing that after two decades, it was time to take stock and face facts (Akrich, 1999). They claimed that the method was ineffective or 'at best' effective in only 10–20% of cases. The publications of the World Federation of Societies of Anesthesiologists, in particular John Bonica's, 1972 book *Obstetric Analgesia and Anesthesia: a Manual for Physicians, Nurses and Other Health Personnel* (which was translated into French in 1975), were put forward as references in this respect. EA technology was presented, in contrast, as a radical solution. It was quickly applicable, and its results were directly observable and difficult to challenge. Accounts from women who had suffered a great deal during birth despite practising the Lamaze method frequently appeared in the newspaper columns. 'Women's voices' were being used as a weapon against the Lamaze method in the same way that they had been used to promote it in the preceding two decades (Michaels, 2010). More broadly, the spokespersons for scientific obstetrics were denouncing the 'pseudo-science' of the defenders of natural birth. They considered these knowledge claims, which relied on nature as their source and revealer, to be what Gross (2007) called 'negative knowledge' (i.e. knowledge deemed not worth exploring because it was possibly dangerous or harmful). In addition, the advocates of scientific obstetrics were refuting the 'ideological science' of the 'birth without pain' defenders by highlighting its communist origins. In their view, the learnt dimension of birth or the 'know-how' claimed by psychocognitive approaches, such as the Lamaze method, were nothing more than vain promises that should be abandoned in the name of birth safety through an unlearning that EA would help to accomplish or through the 'veil of ignorance' (Rawls, 1971) that it would provide. They also claimed that EA's 'unknowns' (its risks and side effects) were insignificant in comparison with the comfort and safety it offered women, and that these 'unknowns' would disappear as the technology improved over time.

'Birth without risk': EA as an 'unlearner' technology

Among the promoters of scientific obstetrics were two prominent doctors who led the 'birth without risk' movement during the 1970s, namely Claude Sureau, Head of the Baudelocque Gynaecology and Obstetrics Unit from 1974 to 1989, and Alexandre Minkowski, the founder of neonatal care in France (and Head of the Intensive Care and Neonatal Medicine Unit at Hôpital Port Royal from 1966 onwards). Both of these men rejected the claims of the 'birth without violence' movement as hypothetical (Sureau,

1978), and even denounced Leboyer's theses as a scandal, accusing him of speaking on behalf of the fetus without ever providing any evidence on the subject. The protagonists of scientific obstetrics also claimed that the defenders of 'birth without violence' had forgotten where the real violence lay. According to them, the real violence occurred when healthcare providers failed to prevent brain damage and disabilities caused during the birth process. These attacks were levelled in a context in which such complications were considered to be a major problem in France (Ville and Lotte, 2015).

The Baudelocque unit rapidly became a leading showcase in France for scientific obstetrics and 'birth without risk' in the 1970s. It offered a brand-new neonatal ward with 98 beds, a wide range of monitoring and ultrasound equipment, and various pain management facilities. 'To live one's birth safely and without pain' became the hospital's motto. EA, nitrous oxide and acupuncture were all offered to help women with labour pain (Special Lundi, 1978).

A major publicity campaign was launched (for EA in particular) under the supervision of Geneviève Barrier, who was a senior anaesthetist at Baudelocque-Port Royal in the late 1970s (Barrier, 1979). She regularly promoted EA on television as a promising pain relief option for childbirth (Homo Sapiens, 1974). While she never denied the risks of EA, she would avoid talking about its potential to cause major accidents due, for instance, to malpractice or complications, and focus instead on the mild side effects, such as temporary headaches and back pain. She would also stress the fact that it was not just the health professionals who had to assume responsibility for these risks but also the women themselves (Special Lundi, 1978). Overall, she presented EA as a modern tool that saved women from suffering and misery; something that could be relegated to the past thanks to technological progress. During this same period, France's late adoption of EA was highlighted in the mass media (Nau, 1980a). The USA and Canada were held up as examples of effective policy-making aimed at promoting the use of EA technology. In 1975, a media campaign endorsing EA was launched by *Parents*, a women's/family magazine (La Rédaction de Parents, 1975).

Bernard Loisel, an anaesthetist at Hôpital Lariboisière in northern Paris, was another prominent promoter of EA during this period. In an article published in the newspaper *Le Monde* in August 1976, he responded to rumours that EA was dangerous for the fetus by citing scientific evidence from a large Canadian study conducted in the 1960s (Loisel, 1976). This study, which involved more than 1000 participants, suggested that perinatal mortality was 70% lower in the case of EA births (Ontario Perinatal Mortality Study Committee, 1967). Based on this and similar surveys, this claim that EA increased safety, especially for newborns, rapidly gained credence.

Another major actor in the promotion of EA during this period was the Maternity Unit at Hôpital Pitié-Salpêtrière, where EA was introduced in 1974. As some of the anaesthetists in the unit had been trained abroad, such as Jeanne Seebacher, EA births quickly became the norm. The Pitié team touted the benefits of the technique in the media, and argued that it had almost no contraindications and higher birth safety levels than other pain relief methods such as sedatives, morphine-based painkillers and volatile

anaesthetics (La Rédaction du Monde, 1979). They claimed that EA reduced labour time, but admitted that it could possibly prolong expulsion time and increase the risk of the use of forceps or a ventouse. They added:

Given these conditions and such a positive success rate, it is quite surprising to still come across so many doubts regarding the epidural, which are definitely more prevalent in the medical arena than among our patients (La Rédaction du Monde, 1979).

There was indeed reluctance concerning EA among a considerable number of OB-GYN and anaesthetists who were not supporters of the natural or non-violent birth movements during this period. Some expressed their concerns in the press, and called for a middle ground between the 'psycho-ecological wave' and the 'machine/obstetrics' approach (La Rédaction du Monde, 1980). They remained sceptical regarding EA and its prospects, in particular because of the risks it carried. Many feared lawsuits in the case of accidents (Nau, 1986), including those caused by neurological lesions due to infection or drops in blood pressure. While the likelihood of occurrence was said to be very low, no medical professional ever claimed it was zero, even those who unconditionally promoted EA as the weapon that defeated pain (Cardin et al., 1986). In addition, the more general increases in the use of monitoring devices, artificially induced labour and caesarean sections led to fears that the childbirth process was being transformed into an emergency case (La Rédaction du Monde, 1980).

In 1977, the famous anaesthetist and member of the Académie Nationale de Médecine Jean Lassner, who was part of the team who had performed prostate surgery on Charles de Gaulle in 1964, criticized the fact that there was a regrettable exaggeration of the indications for EA in certain maternity units, where the EA rate was as high as 80%. He stressed, in particular, that EA slowed down labour, required frequent surveillance and (vaginal) examinations, and increased the use of instruments in more than 60% of cases, at least among first-time mothers. The reason for this, in his view, was that EA masked natural signals and markers during the labour process (La Rédaction du Monde, 1977). He thus criticized EA for being what I have proposed here to call an 'unlearner' technology. While others within the Académie Nationale de Médecine recognized there were rare accident-related risks with EA – especially for the fetus, such as in the case of overdosing, but also for the mother, due, for example, to an unexpected drop in blood pressure – they considered it, on balance, to be a safe technology-in-progress that should be administered with precautions and professionalism (Merger, 1975).

Even at Baudelocque-Port Royal, where Barrier practised, some of the leading doctors were initially cautious about EA. Sureau, for instance, maintained in 1976 that EA should not become a 'médicament du confort' (comfort medication) or be transformed into a woman's right but that it should remain a drug administered on medical indication. He warned in particular against the collective risk that would be created by the routinization of EA. If medical teams were to be mobilized for EA unconditionally, they would be less available for emergencies (Sureau, 1976). He also expressed concern at the costs of generalizing EA

nationwide, and that there was an insufficient number of anaesthetists trained in the procedure.

The risks and 'unknowns' of EA were thus being set out not only by the defenders of non-medicalized or natural births but also within mainstream obstetrics. However, the idea that zero risk does not exist and the belief that technology would improve incrementally prevailed among the proponents of medicalized childbirth and scientific obstetrics. Overall, they saw EA as the revolution that would allow women to finally shake off the anxious representations of painful birth generalized since the 19th century, and embrace comfort for themselves and safety for their babies (Merger, 1975). They believed that the collective imagination around birth itself needed to be revolutionized in this context. Birth was no longer an individual process managed by a birth attendant, but a cooperative process managed by a professional team using high levels of technical surveillance.

Beyond the 'knowns', the 'unknowns' and the 'know-how': technologism as feminism

A significant number of feminists supported and even actively demanded the restructuring of the obstetric system in France from the mid-1970s onwards. After securing key victories in the legalization of contraception (1967) and abortion (1975), they identified women's access to obstetric care as a new battlefield for feminism. However, generally speaking, this never became as central a concern for the French feminist movement as the two previous issues. On another level, the challenges to medical authority (or to the biomedical control of women's bodies) and the mobilizations to reclaim women's bodies and reproductive health for themselves (through, for instance, self-help practices) were marginal in France during this period, partly because OB-GYN had heavily supported the feminist struggles over contraception and abortion (Ruault, 2017). This was not the case in the USA, however, where a critical evaluation of and positioning vis-à-vis biomedicine was at the centre of the influential women's health movement (Davis, 2007; Murphy, 2012). For these reasons, there was no identifiable stabilized or coherent feminist positioning regarding childbirth politics and obstetric interventions in France at this time (Fortino, 1997). Rather, a diversity of positions emerged, particularly in relation to EA. This was due to two factors. First, EA was one of the key innovations in the field of childbirth in this period, but, as mentioned above, access to it was still very limited in the 1970s. Second, in comparison with electronic fetal heart monitoring devices, for instance, the introduction of EA and the question of labour pain it reignited were more closely related to issues concerning women's bodies, their public representation, and their medical and political management.

In the 1970s, the sameness versus difference debate raged intensely within the feminist movement in France as elsewhere (Gambaudo, 2007). It resulted in significant divisions between what I schematically propose, with the aim of highlighting these divisions and tensions, to describe as egalitarian versus differentialist feminists. This analytical choice does not imply ignorance of the fact that feminist positionings have always taken diverse and overlapping forms, and that far from developing different strands, they

were often interconnected (Wajcman, 2007). Among the 'egalitarian' feminists, there was a widespread tendency in the early 1970s to reject motherhood. They considered it to be a central mechanism of the domination and even enslavement of women in a patriarchal society (Les Chimères, 1975; Fortino, 1997). Their hypothesis was that the differences between the two sexes put women in a biologically inferior and infantilized position, and that it was necessary to mitigate such gender inequalities through various means, including strengthening women's presence in the social and political spheres, and embracing technoscience when it offered them the possibility to take control of their own biological bodies.

The feminists who adopted a 'differentialist' perspective refused to consider their bodies as a burden to be hidden, censored or modified through biomedical innovations. They proposed another point of view that remained more marginal. One of the few figures who addressed the issue of medicalized childbirth during this period was Annie Leclerc, a writer and professor of literature. Her 1974 book *Parole de femme* ('Women's voice') launched a heated debate within the feminist movement. Leclerc invited feminists to reject the role that men specifically wanted them to play by denying their biological difference, and to see childbirth and motherhood instead as empowering experiences. She gave an account of her own childbirth experience and heavily criticized the patriarchal, medicalized and 'Fordist' nature of modern obstetrics and the verbal violence of midwives (Leclerc, 1974: 93). Other testimonies of this type were published, for example, in *Les femmes s'entêtent* ('Women resist'), a collective work written by an anonymous group of feminists (Collectif, 1975). One of the contributors strongly criticized the 'dehumanized' obstetrics she had encountered during her own childbirth and abortion experiences. A few years after giving birth to her baby at Baudelocque-Port Royal (an experience that had traumatized her because she had felt 'infantilized' by the medical team), she had had an abortion by the Karman method, a technique for performing abortions in the first weeks of pregnancy that had been imported from China, consisting of aspirating the contents of the uterus using a cannula and syringe (Pavard, 2012). This was an experience that she described very positively (Collectif, 1975: 150). She wrote:

My abortion repaired my birth (experience); my abortion is my successful delivery.

In addition to the critique of dehumanized obstetrics during this period, there was also a high-profile, well-documented feminist critique of EA in relation to synthetic hormones. Françoise-Edmonde Morin, a journalist with *Parents* at the time [she also worked part-time as Foucault's secretary during his final years (Interview 3, 2019)], published two books on the subject. The first, *La rouge différence* ('The red difference'), set out a strong criticism of the contraceptive pill. In particular, she denounced the way in which the pill takes control of the female body, modifies it and makes it somehow sick (Morin, 1982). Her second book, *Petit manuel de guérilla à l'usage des femmes enceintes* ('The little guerilla handbook for pregnant women'), attacked EA on the same grounds, namely that

it was a synthetic hormone (Morin, 1985). Morin argued that EA, in addition to its iatrogenic risks (e.g. headaches, backache, allergic reactions, increased risk of instrumental intervention, etc.), served, above all, to alter, silence and immobilize the maternal body (Morin, 1985: 52–54).

However, not only did this type of criticism of the obstetric system and pharmaceutical products remain marginal, but it also engendered disputes and clashes within the feminist movement of the day (Interview 3, 2019). It was countered by positions such as those adopted by the feminist journalist Marie-José Jaubert, who published two influential books in the late 1970s and actively participated in media debates on the subject. In her first book, *Bateleurs du mal-joli* ('Jugglers of childbirth pain'), she attacked the protagonists of the Lamaze method, accusing them of promoting an ineffective method and even of lying (Jaubert, 1979). In her second book, *Ces hommes qui nous accouchent* ('These men who deliver our babies'), she criticized the natural childbirth movements (especially the Leboyer method) and promoted EA (Jaubert, 1982). She charged the 'birth without violence' advocates with misogyny and with promoting a 'mystique orientale' (Eastern mysticism). She also rejected the idea that different birth preparation methods could provide learning, knowledge or empowerment for women. In her view, they were a means to condition women to believe, in the same way that a religion does, that there is an ideal or perfect way of giving birth. This conditioning was mobilized, she argued, through a variety of illusory techniques, including linguistic strategies. For instance, she criticized the fact that the proponents of alternative birth methods had banned the term 'birth pain' and replaced it with 'contractions'. Jaubert's position characterized the way in which many feminists' positions subsequently evolved with regard to reproductive biomedicine. They abandoned the radical criticism of motherhood, and instead claimed comfort and safety during birth (Fortino, 1997). They adopted a positivist and modernist point of view that was in favour of childbirth technologies and, for instance, hormonal therapies (Löwy and Weisz, 2005). The majority also embraced industrial products such as artificial milk on the same grounds (Didierjean-Jouveau, 2003; Faircloth, 2015).

The feminists' attachment to EA technology was, however, not unconditional. Alongside the aforementioned marginal voices within the movement, even the 'egalitarian' feminists questioned the gendered production of science and technology, but they did so in a quite specific way. The fact that natural birth movements were led by male OB-GYN, or 'gurus', was a principal concern for them. However, they did not criticize EA on these grounds. In other words, they did not denounce it as a technology utilized by men in their interventions on women's bodies. The reason for this was that anaesthesia medicine had not yet become dominated by male practitioners, although it did progressively become a masculinized discipline over subsequent decades. In the mid-1970s, 60% of anaesthetists in France were female, but this number had decreased to 37.5% three decades later (Faure, 2005). In addition, the feminists in favour of EA in the 1970s did not question the fact that EA was a technique developed by men (Wolf, 2009), and that it therefore potentially incorporated masculine symbols and values. Significantly, they actually

criticized France's late adoption of EA for being gendered politics that aimed to discriminate against women and portray them as 'hysterics' by overlooking their needs and not providing effective pain relief during childbirth. Their defence of EA thus implied a need to forget about and move on from the illusionary knowledge or learning claims of the 'birth without pain' and 'birth without violence' movements, which, in their view, aimed to maintain the patriarchal *status quo*.

The harsh criticism and outright rejection from a number of feminists of the alternative birth movements were crucial factors in their devaluation and even disappearance. Odent left the Maternity Unit at Hôpital de Pithiviers in 1985 and moved to London once he realized there was no future for disseminating his method in France because of the hostility of 'hard-core feminists', as he explained during our interview:

There were books like the feminist Marie-José Jaubert's book. At that time, the feminist movement was advocating EA birth. And I knew that as soon as the epidural service was set up, we'd need anaesthetists day and night... We couldn't survive otherwise! We'd lose our specificity. This is one of the factors that pushed me into leaving... People didn't realize it, I couldn't say anything about it, but I was convinced that Pithiviers would disappear as a maternity hospital. (...) At that time... the younger generations may not realize this... what the feminists were doing at that time was they were devaluing everything that was purely feminine... I mean, breastfeeding, childbirth... they devalued everything that was feminine. That was the dominant feminist movement. I was convinced that Pithiviers couldn't survive in the rules that were going to be brought in, including the obligation to have anaesthetists available 24/7 (Interview 1, 2020).

The use of monitoring devices was introduced at Hôpital de Pithiviers a few years after Odent's departure (Interview 4, 2019). The waterproof cables meant they could even be used during water births. In the late 1990s, a period when official concerns about birth safety increasingly led to the closure of small maternity services [the number of maternity services in France decreased from 1369 in 1975 to 814 in 1996 and then to 471 in 2018 (DREES, 2020: 129)], the Maternity Unit at Hôpital de Pithiviers was faced with threats of a shutdown from government agencies because of 'insufficient birth safety', and was subsequently connected to a large hospital equipped with surgical facilities. This allowed and even promoted the generalization of EA within the very cradle of the 'birth without violence' movement (Interview 4, 2019). In the 1980s, the Maternité Les Bluets unit was also forced to gradually review promotion of its 'birth without pain' method in order to incorporate EA. The main reason for this was the difficulty of legitimizing the Lamaze method (which was criticized for being ineffective) as a feminist alternative to EA. Rumours were also rife that the midwives at Maternité Les Bluets unit scored women on their 'performance' in withstanding pain. This further damaged the method's image in the eyes of certain feminists (Jaubert, 1979). In contrast, the method was enjoying increasing success in the USA in the same period. From the late 1960s onwards, the American feminist health movement enthusiastically adopted and adapted the method as a natural, or even counter-cultural, birth method (Michaels, 2014; Wolf, 2009).

Conclusion

As Nancy Tuana noted:

What was once common knowledge or even common scientific knowledge can be transferred to the realm of ignorance not because it is refuted and seen as false, but because such knowledge is no longer seen as valuable, important or functional. Obstetricians in the USA, for example, no longer know how to turn a breech, not because such knowledge, in this case a knowing-how, is seen as false, but because medical practices, which are in large part fueled by business and malpractice concerns, have shifted knowledge practices in cases of breech births to caesareans. (...) Epistemologies of ignorance must focus not only on cases where bodies of knowledge have been completely erased, or where a realm has never been subject to knowledge production, but also on these in between cases where what was once common knowledge has been actively 'disappeared' among certain groups (Tuana, 2004: 195–196).

This article aimed to shed light on a key period of controversy that led to the gradual and active disappearance of the 'common knowledge' of giving birth without drugs in a country that was to become, within the space of three decades, one of the global champions of EA births. This change came in the aftermath of the 'décennie contestataire' (decade of dissent) in France (i.e. the 1970s) which was characterized by, among other things, the rise of ecological movements, the rejection of heavy industries (or the promotion of 'small is beautiful'), and a wider criticism of techno-scientific progress and scientific and medical authority. The defenders of scientific obstetrics and of medicalized or interventionist birth contributed to this disappearance of 'common knowledge' through their promotion of EA as a modern and radical solution to birth pain. They believed that technology was preferable to traditional or esoteric knowledge and 'know-how' (promoted by the defenders of natural or psychocognitive approaches to birth), which had to be unlearned both to better mitigate the risks of childbirth and to provide birthing women with real possibilities of empowerment through biomedical progress.

This study shows that in a biomedical controversy such as that examined here, the different participants in the debate never defend only knowledge or only ignorance. In other words, there are rarely ignorance producers on one side and knowledge producers on the other. In the EA controversy of the 1970s and 1980s, each birth movement referred to and promoted specific forms of knowledge (whether driven by technology, nature or psychology), and denounced or adopted certain forms of ignorance. Significantly, while the defenders of EA advocated the development of anaesthetists' competencies and 'know-how' so that they might better master their tool (EA), and encouraged regulatory knowledge to improve the safety of EA, they also denied that birth could be made safer without technology or through a better observation of and knowledge production concerning female physiology. The defenders of the Lamaze method, on the other hand, advocated wilful ignorance of the surplus of knowledge generated by machines such as

monitoring devices, while at the same time claiming the production and defence of 'know-how' on psychocognitive pain management.

Ultimately, the defenders of EA won the battle, not just because of their active ignorance production over the 'knowns' of technology-free childbirth but also because, among other things, the claims of the ecological or psychocognitive movements to knowledge and 'know-how' in the field were replete with epistemic gaps (i.e. uncertainties or 'not-knowings'), practical limitations and political ambiguities, which prevented any possibility of wide dissemination. The way in which the alternative birth movements framed the novel or, conversely, the established nature of the knowledge they defended played an important role in this respect.

Echoing and extending Tuana's observation, the case study discussed in this paper also suggests that even the identification and recognition of what common knowledge or 'know-how' is and is not can never be taken as evidence in and of itself. The very existence and significance of common knowledge can be subject to heated debate. Furthermore, the boundaries between common or established knowledge and 'know-how' versus new, innovative or technology-driven knowledge and 'know-how' may not always be clearly drawn. In addition, the actors that defend different doctrines or views may not always mobilize these categories (either to adhere to them or refute them) in their efforts to validate and diffuse their arguments and causes.

During the French EA controversy of the 1970s and 1980s, both the natural and medicalized birth defenders claimed that their model was an innovative replacement for an obsolete obstetric system that was criticized for being unsafe by decision makers, and for being dehumanizing or disrespectful with regard to women's needs and demands. As an alternative, the 'birth without violence' advocates defended the science of the natural and the production of knowledge that should be retrieved from the mother's and baby's biological bodies. However, in so doing, they failed to refer to and rely on millenary-long midwifery knowledge. They did not actively seek the creation of a coalition of causes with midwifery groups, who, along with 'non-violent' OB-GYN, could have politicized their knowledge and competencies in the defence of women's rights. Their knowledge claims thus remained essentialist and irritated the feminist movement. At the same time, their denunciation of non-knowledge or 'undone science' regarding EA's side effects and potential long-term psychological or health effects for the baby was hampered by the difficulty of establishing, funding and validating the laborious epidemiological data collection that would be required at the margins of the official spheres of knowledge production. The defenders of the Lamaze method placed more emphasis on the 'know-how' that it provided in the management of birth pain, which they argued was common knowledge spanning at least the previous two decades. However, they failed to counter the critics (including the feminist movement) who accused them of promoting an authoritarian, ideological and ineffective method. The defenders of scientific obstetrics and EA made good use of such ambiguities and gaps to categorize the alternative birth movements' knowledge claims as illegitimate, useless, too esoteric and dangerous. Regarding the accident-related risks and side effects of EA, they also made

performative use of uncertainty by putting forward both its benefits and its importance as a symbol of modernity, progress and comfort for women, and by urging those who were undecided (including practitioners) to adopt it and to have confidence in the capacity of biomedicine (and EA) to improve over time. EA was to gradually become an 'un-learner' technology that empowered women in the aftermath of an epistemic battle in which the political and moral dimensions of knowledge and ignorance appeared to be key.

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