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Pregnant Bodies, Physical Activity and Health Literacy

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Abstract

In this article, we study health literacy as entangled and situated processes of *authorisation* of pregnant women to become competent caretakers of their own physical activity and health based on the development of the practice of 'learning to take notice'. Based on our ethnographic fieldwork in a randomised controlled trial on physical activity during pregnancy called *FitMum*, we develop a processual conceptualisation of health authorisation as multidirectional flows between participants, staff and technologies. Using the concepts of attunement and authorisation from Latour and Despret, we suggest that health literacy is not just something that can be acquired once and for all, but is processual and must be maintained, nurtured and developed through continuous negotiations, adjustments and adaptations to the constantly changing conditions of the health subject.

Keywords

attunement, clinical trial, ethnography, health literacy, health promotion, physical activity, pregnancy

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Introduction: Becoming a Physically Active Pregnant Woman

In this article, we explore the possibilities for developing health literacy and sustainable health practices as conceptualisations of health authorisation processes, that is, ongoing and continuously negotiated and distributed processes. The article is based on empirical findings from a randomised controlled trial (RCT) on physical activity during pregnancy called *FitMum*. The aim of the FitMum trial was to investigate different models for implementing physical activity in the everyday lives of pregnant women (Roland et al., 2021). Participants were to reach a minimum of 30 minutes of physical activity at moderate intensity per day, as recommended to healthy pregnant women (Klarlund Pedersen and Andersen, 2018). A success criterion of FitMum was to give future pregnant women the competences to develop and maintain a physical active practice that suits them during pregnancy – and to find the most sustainable approach for enabling a continuous practice of physical activity after pregnancy and the end of the trial.

Like FitMum, numerous health interventions centre on creating sustainable lifestyle changes. Many focus on the development of health literacy, that is, the knowledge and skills to make appropriate health decisions in everyday life (Kickbusch et al., 2013; Nutbeam, 2008; Peerson and Saunders, 2009). Don Nutbeam defines health literacy as the skills critical for developing a sense of empowerment, based on the acquisition and appropriation of health-related knowledge, thereby increasing the ability to act (Nutbeam, 1998). Thus, health interventions work to create skilled health subjects by providing relevant information, techniques and tools that give the recipients the skills to become independent managers of their own health (Rademakers and Heijmans, 2018). This model of transfer of knowledge and authority moves vertically, from health authority to health subject. In contrast to this vertical model, we argue that health literacy rather than an outcome (Nutbeam, 2008) is an ongoing process; a constant *becoming* health subject. We suggest that health literacy must be approached as a form of authorisation process. By authorisation process we mean the acquisition of the competence to assess and attune to the state of the body, that is, developing repertoires for being and acting with and as a body (Latour, 2004). In the FitMum study,

we have found that processes of authorisation are pivotal for creating a sense of competence for the participants to be able to judge which kind of exercise is doable at the given time of the pregnancy. The trial is not simply installing medical knowledge in compliant health subjects. A plurality of knowledges, competences and experiences intermingle and affect each other. We conceptualise this as the authorisation of pregnant women to become competent assessors of the state of their pregnant body, and caretakers of their physical activity and health through the practice of *learning to take notice* (Latour, 2004).

We draw on Bruno Latour's (2004) notion of attunement to investigate how the women learn to take notice and develop a new repertoire of bodily experiences, learning to distinguish between 'good' and 'bad' bodily signals in relation to physical activity. We combine this with Vinciane Despret's (2004) discussion of authority. In this process, authorisation flows between actors as they negotiate and develop knowledge based on the experiences of bodily changes throughout pregnancy. We describe health authorisation processes as situated, ongoing and heterogeneous processes. The relations between health professionals and participants in the trial can be understood as a continuous health authorisation linked to an understanding of the subject as constantly *becoming*, shaped by and with socio-material surroundings. Health authority becomes relational and distributed: collectively negotiated and renegotiated as everyday life, body and relationships change over time. We draw on empirical examples of how the pregnant women learn to navigate within health advice and bodily signals through their pregnancy as an ongoing practice formed by heterogeneous actors. The pregnant women learn to become gradually more attuned to what it means to have a pregnant body, and how to be physically active while taking care of this changing body and its signals. Activity trackers, clinical tests, counselling sessions and group interactions all take part in this process. We find that learning to take notice is contingent on the reciprocal and heterogeneous flows of authorisation. Learning to take notice is a distributed process, supported by socio-material assemblages that allow health authorisation to flow.

With our analysis, we contribute to the field of health promotion and health literacy, and to the prolific discussion of outcomes of health promotion. Our analysis adds a deeper understanding of the

importance of relations and reciprocity within health literacy, which with our reframing through the notion of authorisation becomes processual and contingent rather than an individual competence or state. We furthermore elaborate on the challenges of managing and understanding pregnant bodies both within clinical trials and within the experience of pregnancy. As bodies that challenge categories, sense of normalcy and sense of self, pregnant bodies point to the fault lines of our categories and challenge the image of 'generic research bodies' (typically White male), and thus our work contributes with more nuanced understandings of relations between science and participants, and between bodies, social norms and technologically mediated knowledge (Merone et al., 2022).

Authorisation and Attunement

In her paper 'The Body We Care For: Figures of Anthropo-zoogenesis', Vinciane Despret (2004: 120) discusses authority as a matter of enabling and making things happen. Despret suggests authority is less a matter of power, and more a matter of trust, expectations and mutual relations. It is a complex process where actors are authorised to become competent. For instance, Despret describes how an infamous scientist named Robert Rosenthal authorises (enables) his students to become competent experimenters, and the students authorise (enable) their lab rats to be competent experimental subjects. This chain of authorisation is not hierarchical, but circular: it enables the rats to take a more active role in the experiment. The rats authorise the students to authorise the rats, and the students authorise Rosenthal to authorise the students. They believe in each other, their faith and expectations make them available to new events and becomings-together. Authorisation processes are thus processes of making oneself and others capable in a process of mutual transformation (Despret, 2004: 125). This shifts the focus on authority from a matter of asymmetrical power relations where staff can instrumentally steer or guide participants in certain directions, to instead focus on circular processes and events that enable new becomings. From a structural perspective, the relation between health professional and patient is a hierarchical (power) relation. Jespersen instead describes authorisation as distributed, suggesting that it is relationally emergent and negotiated (Jespersen, 2007). We build upon this elaboration in our operationalisation

of Despret's discussions on authority, with an understanding that authority is relational and based on mutual recognition. In her description of relations between scientists and the animals they study, Despret (2008) suggests that this mutual recognition and making each other capable is a proposal of subjectivity that, when accepted, is actualised and verified, 'through becoming what the other suggests to you' (p. 135).

We suggest that, if health authorisation of the pregnant women participating in the trial is to succeed, they must *learn to be affected by differences*. They must *learn the practice of attunement* (Latour, 2004). To be(come) a (some)body is to take part in the world and interact with it with your sensing body. This process of be(com)ing requires a navigation and attunement to the socio-material circumstances surrounding the body and self: an ability to learn, adjust, prioritise and draw boundaries. An articulation by which the subject is affected by differences relates to these and thus becomes an articulated, embodied subject, learning to find more differences and nuances (Latour, 2004). In the case of the pregnant research subjects, this comes to be in the form of noticing and discerning between the different bodily signals, such as pains, soreness, aching, fatigue, heaviness or breathiness. False contractions, natural ligament pains or pelvic soreness can be interpreted as dangerous or warning signs or raise fear of early labour, pelvic girdle relaxation or harm to the baby. However, they can also be natural indicators of the bodily changes during pregnancy. Experiencing these differences in bodily sensations and recognising them as markers of either potentially good or potentially bad, and knowing how to respond, is crucial to enabling a sustained yet modifiable practice of physical activity. One needs to know when to press on, and when to take a break. We point to this practice of health authorisation as a potential of the clinical trial as it facilitates an embodied approach to the pregnant participants, making room for negotiations and sustained adaptations in accordance with their experience.

The FitMum Project

The FitMum project is based on a 3-year clinical trial at Nordsjællands Hospital (NOH) in Denmark, which tested the effects and feasibility of two different exercise programmes on 220 healthy, pregnant

women. The trial was a longitudinal transdisciplinary study involving clinical, physiological and ethnological perspectives on physical activity during pregnancy. The FitMum project had several substudies; one being the qualitative study conducted by the authors, who were an integrated part of the research team. Scientific and clinical staff collaborated on producing knowledge and data under the terms of the trial, with different scopes and methods. Inclusion criteria were as follows:

18+ years;

Gestational age (GA) maximum 15 weeks with a singular pregnancy;

Body mass index (BMI) of over 18.5, max weight of 150 kg;

Not in psychiatric treatment;

Owner of a smartphone;

Able to wear an activity tracker for the duration of the intervention (Roland et al., 2021).

Participants were recruited via information material distributed by hospital staff at the standard 12-week scan at the hospital, and by the local general practitioners (GPs), as well as advertisements via local media and relevant webpages. Potential participants filled out screening forms and were invited to an inclusion meeting if inclusion criteria were met. At the meeting they (and partner) filled out consent forms in accordance with Danish GDPR legislation. FitMum is approved by the Danish National Committee on Health Research Ethics (#H-18011067) and the Danish Data Protection Agency (#P-2019-512). All participants gave written consent before inclusion, and participants who were interviewed gave an additional written consent.

All participants were part of the Nordsjælland hospital district, which is characterised by a relative affluence and high educational level compared to national levels. The citizens belonging to the district are in the topmost of the official social group rankings by the municipalities (Gøtzsche, 2021). Participants had a comparatively higher level of education (BA or more) than the general population in the area (with 87% vs 29%) and reported a high degree of ability to

independently structure their work life (Knudsen et al., forthcoming).

Participants were randomised into three groups:

1. Structured fitness training three times a week, conducted in team sessions at the hospital gym or at the local swimming pool, supervised by health professionals part of the research team.
2. Motivational counselling in individual and group sessions, and exercising on their own, based on their own goals and exercise plans defined in collaboration with the staff.
3. Control group.

All participants underwent clinical tests, generating blood samples, urine samples, breast milk samples and full body scans.

This article is based on qualitative methods: extensive participant observation during all parts of the trial, semi-structured interviews and standardised qualitative interviews at baseline and follow-up (Tjørnhøj-Thomsen and Whyte, 2008). All 220 participants were interviewed at inclusion (average duration 15 minutes), 30 were also interviewed halfway through (average duration 1 hour), 14 were interviewed after they decided to drop out (average duration 15 minutes) and 52 (with more to come) have been interviewed at the end of participation in the trial (at follow-up 1 year after birth) (average duration 15 minutes). The multiple points of interview during the trial serve to gain processual insights into the experience of participation and to create longitudinal perspective. The qualitative material was produced, fully transcribed and coded within the qualitative substudy. Insights were shared with the entire research team as part of the study's closely integrated scientific community.

Learning to Take Notice: Attuning to the Pregnant Body

The advice on physical activity given by the staff is in accordance with the advice often given by midwifes and doctors: take notice of your body. This is based on a general trust and belief that (1) the body is capable of sending warning signals in the form of pain or discomfort and (2) pregnant women are able to sense these signals and recognise these as warning signs. However, pregnancy is often

characterised by uncertainty about what is normal, abnormal and potentially dangerous. Some of the participants express uncertainty about handling conflicting signals and sources of knowledge. Some express receiving mixed advice and expectations from media and relations, conflicting with their own expectations regarding what one ought to do or how one ought to feel during pregnancy. Knowledge and recommendations have changed from generation to generation, and social media adds to the amount of conflicting advice (Downs et al., 2012). The pregnant body is embedded in sociocultural norms and politics, and fraught with differing kinds of knowledge, discourse and norms. Pregnant bodies are expected to behave in certain ways, and these prescribed behaviours have been repeated into 'naturalness' (Longhurst, 2000). One of the dominant discourses on the pregnant body suggests that it is uncontrollable and unruly. Yet pregnant women are, paradoxically, held accountable for the state of their body and the health of their child through controlled, healthy and responsible practices (Carter, 2010). Ideally, then, the pregnant body is to be managed as a state of controlled chaos. As a result, many of the women struggle with their sense of self and not being able to distinguish how they *feel* from how they *think* they *should* and *should not* feel.

The FitMum staff seek to authorise the participants to become self-aware, able to understand the signals of their bodies and translate them to practice. To incur this assessment, the participant is searching for a qualified mandate and support. Thus, the process of authorisation is mutual: the pregnant women authorise the staff to authorise the pregnant women to become authorities on their own bodies.

This search for attunement and getting a sense of the body is a recurring theme in the participants' accounts of their experiences:

Interview with research participant from counselling group:

> *What's been most difficult to me in terms of training [. . .] has been to find out what I can do and what I can't, what I should do and what I should avoid. Because even though I do not think my body has changed that much, it's still an upheaval. You have to get to know your body again and figure out, if I feel pain in the stomach is it abs or is it the baby? The same thing with back pain or leg cramps or what do I know. It's been difficult sometimes just finding out. When do I push myself too hard and when do I push myself enough?*

Pregnancy is for many women experienced as one of the most life changing periods physically as well as socially and mentally. Among other feminist cultural analysts, Samantha Warren and Joanna Brewis (2004) describe pregnancy as revelatory in making the pregnant woman aware of her body in new multiple ways, forcing her to re-enter into the world. In pregnancy, boundaries of the body are pushed and expanded, while the body and its movements simultaneously become more limited. The body is often experienced as more fertile and vital, yet also more uncontrollable. Pregnancy is often an ambivalent period: an ambiguous experience of pleasure, pain, gratitude, responsibility, confusion and frustration. As Rachelle Chadwick (2018) notes, birthing bodies are often fraught with norms, politics and technologies. They are complex, entangled and emergent (Chadwick, 2018: 3), yet often conceptualised in useless dualisms such as mind-body and normal-abnormal. The failure to acknowledge the socio-technical becomings of pregnant bodies results in a too narrow repertoire for understanding and expressing the experiences of pregnancy and birth.

The pregnant woman may experience pregnancy as a liberation from responsibilities, duties, condemnation and body ideals. However, it can at the same time be a frustrating, sometimes painful and alienating process wherein the signals of the body do not always match mind and expectations. The pregnant body is not always as cooperative and responsive as often represented and imagined in Western culture (Warren and Brewis, 2004: 219). Understanding the pregnant body in a more nuanced way, better and more healthy pregnancy becomes not just a matter of instilling knowledge and motivation. Healthy pregnancy becomes an issue of learning to live with a body constantly in motion and to manage changes of everyday practices, embodied and social challenges.

In the project these aspects of understanding and managing the changing body represented the greatest concern and challenge to the participants:

Interview with research participant from exercise group:

> *That I am constantly presented with 'remember to listen to your body' has definitely been positive for me, because I am in a situation right*

now where my body does something different than usually, and there are a lot of signals that I cannot distinguish whether it is something or not. What should I act upon, and what do I not have to act upon? But when someone is constantly telling to 'take notice', then I can feel that now I am more aware of it, trying to judge whether this is just me being a bit out of breath, or whether it is just my body trying to tell me something. In that way I am using it quite a lot.

For many participants, one of the main gains of the trial is the possibility for reassurance. Aided by the professionals or the other participants in the exchange of experiences, knowledge, obligations, support and care, they are supported in learning to take notice. Most exercise group participants highlight their relationship with other participants and the staff as an important factor motivating them to continue. They consider the exchange of embodied experiences as the most useful kind of knowledge gained.

Interview with research participant from training group:

The brand-new ones we're just thinking 'what's that?' I've never been pregnant before. I don't know how it feels. Then I had to ask one day like 'okay, what does a practice contraction feel like?' I really feel pain on the side when I walk fast. Could that be it? Then I got it explained. It is very nice to be in a group where you can ask these questions and get answers. I know you come to a doctor and midwife, but there's just something different about hearing it from someone else who is pregnant as well, rather than a dedicated professional sitting opposite you. 'Well, it feels like this and such'.

Knowledge and authority flows back and forth between participants. The experiences recounted by others can be very similar, so experiences are compared and used to gauge whether this is similar enough to warrant a classification (good pain or bad pain). This serves as an onset for determining a course of action (to keep going or take a break). What one participant feels help the next participant to understand what she feels.

Participants from the training group meet several times a week for the exercise sessions at the hospital gym or in the local swimming pool. Participants are asked to keep an eye on their activity tracker, trying to reach a pulse of 120–160 during the cardio. They should be feeling out of breath to the degree that it is hard to continue a normal

conversation (based on the BORG scale: a subjective measure of perceived effort; Borg, 1970). During the sessions, the staff continuously ask the participants to take notice of the signals of their body. Learning to navigate with and in a body in motion attuning and adjusting by noticing: How does it *feel*? Is it uncomfortable? Does it hurt? Where does it hurt? Do you need to adjust a bit? Do you need to stop, or are you able to push yourself a bit further? Even though this for some feels like a delegation of responsibility, this self-care approach is for most of the participants appreciated as an important part of the learning process, reminding them to be an authority on their own body.

The group counselling sessions comprise themes of recommended forms of exercise during pregnancy, practice contractions, pelvic instability, divided abs, Kegel exercise, ruptures during birth, recommended work out and rehabilitation practices postpartum.

The group sessions function as a guidance throughout pregnancy, leading the participants to focus on specific parts of their body, learning specific body techniques to prevent complications and dealing with physical activity as a shared everyday life challenge at the same period of their pregnancy.

At one of the group sessions, the topic was exercise after giving birth. The physiologist explains how to strengthen the pelvic floor with Kegel exercises, to ease the birthing and decrease the risk of post-partum incontinence. With illustrations on the smart screen, the physiologist explains the mechanics of the pelvic floor and the Kegel exercises. She then suggests that all try to perform the exercises, to get the sense of how it feels.

Field notes from group counselling session:

In silent concentration, all the participants follow her [Staff's] instructions:

> '*Squeeze now, hard, harder, as hard as you can, then hold. And let go. Take a rest and repeat*'.

> Then again with different rhythms and durations of the squeeze-hold-let go. One participant asks how she could know if she is doing it right? The physiologist replies that she can try doing it while peeing, and if she can stop the stream of urine, she's doing it right. Then [Staff] goes on to talk about perineum ruptures, showing with drawn

illustrations the different degrees of ruptures, and how to treat them afterwards. How you can make an ice bandage to cool down and soothe the area. How to go to the bathroom when having had a rupture; supporting the area with a tissue while peeing or emptying the bowels, to decrease the discomfort. One participant wants to know how exactly that works; the practicalities of making an ice bandage, which the physiologist has not elaborated. The one who has given birth previously offers a description of how you can wet hygienic towels, put them in the freezer and then put them in your panties wrapped in cloth – to not get frostbites down there, she laughs. The other one still looks puzzled. The experienced one explains that you get enormous underpants with plenty of room for the diaper-line hygienic towels you need after giving birth.

'*But won't the ice pads melt straight away?*', the other one asks.

'*Yes*', the first replies. '*And that's rather wet of course*'.

Then she adds a description of how you can use a hand-held showerhead to shower yourself underneath while on the toilet, to help the urine and faeces out. The other two listen with incredulous, but deeply interested looks. The physiologist then continues to talk about when to resume your exercise routine after giving birth.

These field notes point to detailed practical embodied descriptions helping first-time pregnant women imagine specific situations yet to come. What am I to expect and how to deal with it? Exactly *how* do I make an ice bandage on my own and avoid getting frostbite? The often purified, clinical descriptions of birth and post-partum conditions tend to eradicate the messy details of bodily fluids, swollen nether parts and the practical aspects of wearing big underpants or diaper-sized hygienic pads. In research as well as in society and the way birthing is presented in media, there is a significant lack of focus on the fleshy, embodied experiences of giving birth (Chadwick, 2018; Cooper & Godfrey-Isaacs, 2020; Yam, 2019). The pregnant body and its fluids and leakages are often connected with shame and disgust, and thus not to be spoken about in most social situations (Silverio, 2019). The group sessions provide a safe space to discuss this without shame, judgement or fearmongering.

Authorisation Through Socio-Technical Collectives

At test visits, clinical measurements and biological samples monitor the progression of the pregnancy via weight, measurement of cervical height, blood pressure and estimation of foetal size, much akin to the standard visits at their doctor and midwife. Numbers and graphs indicate the health of mother and child, and the values are analysed according to standards for weight, size and so on during pregnancy. All measurements and samples are subject to assessments, interpretations and adjustments in order to make sense of them in relation to the present state of the participants. These data are seen in the light of participants' history in the trial and their personal history:

Field notes from a clinical sampling session:

> '*Does baby have the right size and is everything normal?*' [Staff 1] asks.
>
> '*Yes, I'm on the curve and I still feel the baby rotating in there*' [Participant 1] responds. '*Yes, and that's quite normal as well*' [Staff 1] assures.
>
> [Participant 1 takes off her shoes and steps unto the weight. [Staff 1] types her weight on the computer.
>
> '*That's just so impressive [Participant 1]! Aren't you satisfied with that?*' [Staff 1] asks.
>
> '*Yes, and a bit nervous about it too. I think I'm eating more and more*' [Participant 1] says.
>
> [Staff 1] shakes her head: '*No, baby eats a part of it as well and you've only gained one kilogram while participating in FitMum. That's very impressive*'.
>
> This means that [Participant 1] has actually lost weight because the baby weighs something as well, [Staff 1] explains. A standard curve with BMI categorisations and related guidelines on weight gain during pregnancy is hanging on the wall above the computer. The curve

> shows that for women who can be categorised as normal weight with a BMI on 18.5-24.9 a weight gain of 11.5-16 kilos during pregnancy is recommended but for an overweight pregnant woman [Participant 1] with a BMI on more than 30 only 5-9 kilos are recommended.

The clinical measurements are set in relation to personal hopes and previous health conditions. Because of [Participant 1]'s weight upon entering the trial, her present weight gain and the projected gain for the rest of the pregnancy is to be seen and treated differently than if her BMI had been lower upon entering the trial. The recommendations for pregnant women emphasise not attempting weight loss during pregnancy, unless the pregnant woman is overweight. In this case, as [Participant 1] has a high BMI, it is recommended that she limits the weight gain, which is why [Staff 1] was praising what can be considered a loss of body fat during pregnancy. [Staff 1] is trying to affect [Participant 1]'s feelings about her weight, giving reassurance and hoping to instill satisfaction on the controlled weight gain. Having explained how the weight assessment is made enables [Participant 1] to understand and aim towards the optimal level of weight gain. [Staff 1] is hereby teaching [Participant 1] a combination of acceptance and action points and awareness that can help her to feel better about her body, while continually managing her weight. [Staff 1] even offers a reinterpretation of the weight gain as a weight loss, as the gained weight is ascribed to the baby, and not [Participant 1] herself. Thereby the responsibility for [Participant 1]'s health and weight becomes distributed between [Participant 1] and her body, the baby, the technologically mediated measurements, the standard norms for weight gain in pregnancy and the situated interpretations of [Staff 1]. In collaboration, [Staff 1] and the technology are working to contextualise the measurements, but also striving to include [Participant 1] in a more distributed and heterogeneous assemblage of authority, emotions, experience and goals. These are at once drawing on past, present and future and are highly situated. [Participant 1] is learning to assess and handle her bodily condition, not in comparison with the weight gains of others, and not only based on the standard recommendations, but based on her personal history and development and with the aid of technologies in socio-material collectives.

We conceptualise technologies in the broadest sense, as all techniques, procedures and devices used to assess the physical state of the participants. The monitoring of the participants is crucially to produce clinical data. It also supports the development of doable exercise practices, and the authorisation process of learning to take notice. The technologies of the trial help to distribute authority and to expand the repertoire for sensing the body. As such, the technologies become assistive in making connections between measurements and sensations. For instance, the measurements of cervical height inserted into graphs for average growth rates can serve to reassure a participant that everything is normal, and a less-than-expected weight gain is due to the loss of fat, and not reduced foetal growth. Or when the measurement of blood pressure confirms normal conditions, reassuring that a participant can safely engage in physical activity, as her dizziness or nausea stem from normal pregnancy symptoms and not preeclampsia.

To monitor their daily exercise, all are fitted with compulsory activity trackers, and the participants can follow the data produced for the trial, by themselves:

Interview with research participant from counselling group:

> *I think it's been nice and fun to follow [data on activity tracker] and also the fact that when you go for a walk you can see the pulse is right and such. It's a good guide until you learn to feel by yourself how fast to breathe when it [pulse] is where is should be. So, I think it's been a huge help to have [. . .] Now, I don't feel the same need as in the beginning*.

Many participants initially expressed concerns at the prospect of wearing trackers for the duration of the trial. Some have dropped out due to the discomfort of wearing them, others have expressed an increasing interest in tracking, and others again have not really been interested in using the tracker to support their own practice. For the trial, they are invaluable, not only for the registration of data, but as tools to understand and facilitate doable exercise practices for the participants. As the above participant expresses, the watch teaches her how her pulse should feel when she is on the right level of strain, and in that sense it helps to take notice. Technology is often considered as mediating bodily experience and as inscription devices producing

hard data (Dalibert, 2014; Latour and Woolgar, 1986; Verbeek, 2008). Self-tracking technologies render visible previously invisible parts of the body (Ruckenstein, 2014) and thus assist in creating bodily awareness. Deborah Lupton notes that serving as biopedagogical tools, self-tracking technologies can teach people to become healthier and more productive citizens (Lupton, 2016). In literature on self-tracking and health, self-responsibility and self-management are dominant themes as users or patients employ self-monitoring to improve health or well-being (Lupton, 2017). In FitMum, the trackers themselves are not the central actors in the process of learning to take notice. The measurements and technologies do not have the overall authority: they are set into context and related to personal situations and experiences by the staff. Here, the data produced by technology is mediated by the staff and becomes meaningful as part of the socio-technical collective of the FitMum trial. The trackers do not distribute agency and responsibility to individuals but link together health professionals and participants through their data reports that serve to continually expand knowledge about the body and adjust intervention forms. The trackers can be in conflict with the bodily signals, contractions or pelvic pain being indicators of the need to stop, while the tracker shows too few steps according to plan. In fact, one of the most important lessons for the participants is that the tracker should not take the lead, the body should. They do not create self-care understood as care *for self* conducted *by self*, but care in socio-technical collectives. It is a form of care that is distributed and interdependent (Mol, 2008). In combination with the clinical technologies, trackers are taking part in the development of attunement, contributing to the authorisation of the pregnant women, teaching them to navigate within, read and differentiate specific signals of the body, noticing heartbeat, adjusting intensity and thereby assisting in maintaining exercise. The technologies serve as mediators of bodily experiences, as proxies that articulate what the subjects themselves have not yet learned to be attuned to.

But not only physical sensations matter in the assessment of condition: emotions and beliefs are part of the practice of taking notice. At the individual counselling sessions, training plans are developed with guidance from the staff who recommend certain sports and appropriate ways of being active during pregnancy. Swimming, power walking and biking are often suggested.

Field notes from individual counselling session:

> [Staff 2] and [Participant 2] discuss her training plan; at what level, which days and what kind of activity she prefers. [Staff 2] suggests running because [Participant 2] is not that heavily pregnant yet, but [Participant 2] shakes her head immediately:
>
> *'I have a completely fixed idea that I shouldn't run while pregnant. I don't want to start running now. It may well be that you can easily do it. I just have a strong belief that you shouldn't'*.
>
> On that, [Staff 2] states:
>
> *'You may run but if you get too many practice contractions you shouldn't. If you haven't run before and don't feel like it, then you shouldn't. There are many other ways to get exercise, but we recommend running if you've been used to it'*.

During this individual counselling session, the participant holds on to a strong personal belief that she should not run during her pregnancy. Many actors outside the trial at the hospital have taken part in shaping this strong belief. It is shaped in many contexts, influenced by media and advice from friends and family members. As well as social relations, physical activity habits and experiences from earlier pregnancies influence participants' health beliefs and practices. The staff cannot simply discount these, as a central part of the project is to teach the women to learn to take notice, and to find out what works for them. So instead, [Staff 2] concedes that [Participant 2] does not have to run if she does not feel like it. She can find something else to do that she feels better about.

[Participant 2] is on the way to learning to take notice of not only how it *feels* but also how she feels about it, and therefore she can decide whether to run or not, as the staff states. [Staff 2] thereby authorises [Participant 2] to choose. This highlights the translation from standard recommendation to practice as a process, which requires an awareness of existing health beliefs, past experiences and narratives. In this horizontal and distributed notion of health authorisation, it is not up to [Staff 2] to prescribe any actions, but to respect the historicity of [Participant 2]'s bodily experience, and how that

affects her current relations to physical activity and her body. Fear, beliefs and personal values are strong actors in the distribution of authority, and rather than working against them, the staff must work *with* them as fears can indeed become self-fulfilling prophecies: feeling bad *about* an exercise form may lead to feeling bad *from* it (Fredrickson, 2000; Howell et al., 2007; Kok et al., 2013; Salovey et al., 2000). Emotions are strong carriers of authority (Kastely, 2004). So the staff always proceed with caution.

The participants' experiences from their current as well as past pregnancies are considered as a part of the knowledge produced and practised in the trial. Personal experiences and advice from participants going through their second or third pregnancy are exchanged and shape both their own practice and that of the other participants via the group sessions. Here, authority is configured in particular ways, flowing back and forth between participants, and between participants and professionals in complex patterns of interdependency and supported independence. The participants are granted and granting competence to feel, recognise and act upon bodily signals in conjunction with stories, experiences, emotions, beliefs and scientific facts.

Field notes, group counselling session:

> [Staff 3] presents recommended exercise postpartum on the smart screen at the last group session:
>
> *'Okay then we have this exercise down on all fours. You have to lift opposite arm and leg diagonally and shift from side to side and again, start just doing ten on each side'.*
>
> [Participant 3]: '*but that one is hard to begin with*' to [Participant 4], who nods appreciatively back.
>
> [Staff 3] shows another exercise example on her power point slide.
>
> '*This one you lie down like a plank*'.
>
> She puts on a video demonstrating the right way to perform the exercise.

'*This one you could do with a newborn*'.

[Participant 5]: '*But that baby is at least 6-7 months old!*'

[Staff 3]: '*Yes, when you get better, you can stretch your arms at the same time*'.

She shows how to adjust and goes through the last exercise.

[Participant 5]: '. . . *but that one is very hard especially to the pelvic floor'*.

[Staff 3]: '*Yes, if you have had problems with your pelvis then you have to . . .*'

[Participant 3]: [interrupting] '. . . *and its hard doing it with a baby*'.

[Staff 3]: '*Yes, I also think you have to do it without a baby in the beginning. So again, this training program is a guidance, but you have to feel it out for yourself*'

[Participant 5]: *'I know it's a good thing to be active during pregnancy, but I try to be as prepared for the birth as possible, meaning getting some sleep and . . .'*

[Staff 3]: '*Mmm, so a few walks to the extent you . . .*'

[Participant 5]: [interrupting] '*Yes, or just whatever makes sense*'.

This passage from field notes exemplifies how the staff are learning from the participants, presenting the training programme as a guidance and asking participants to 'feel it out for yourself'. This sometimes leads to negotiations and adjustments, and emphasises the processes of affectuation, and the distribution of authority. The official guidelines are but one source of knowledge, to be translated and adjusted into applicability by assessing them against previous experience, envisaged future and existing values and beliefs. The staff are

often focusing on the amount and intensity of physical activity as an isolated phenomenon leading to a healthier lifestyle. The participants' perception of a healthy life is not always in accordance with this. As [Participant 5] adds at the end of the conversation, for her, expecting her second child, the most important thing is not exercise but rather preparing for the imminent birth, which means getting some sleep and being rested before giving birth.

Standard recommendations given by the staff at the group conversations are subject to negotiations or adjustments by participants with one or more children. Their personal experiences focusing on practicalities and social aspects nuance and contextualise the recommendations. This is appreciated by the first-time pregnant participants who do not know what to expect. Embodied experiences of pregnancy, childbirth and motherhood become hallmarks of expertise and authority at the same level as medical knowledge.

These questions and collectively negotiated suggestions are reminding us of the importance of exploring the co-production of knowledge as situated: produced in and by specific contexts in collectives of bodies, technologies and practices (Barad, 2007; Bønnelycke et al., 2019; Despret, 2004; Haraway, 1988; Latour and Woolgar, 1986). The relations between participants, and between participants and staff, produce lines where authorisation flows back and forth in a dynamic relationship. Not in a one-way vertical relation, but in horizontal lines and rhizomatic connections. The participants recognise and thus authorise the staff as able to authorise them to become health subjects. They are collaborators in the process of becoming a pregnant, active body, developing new repertoires for feeling, experiencing and acting. New body-world connections are produced, in which a richer repertoire for being in the world as a pregnant body is developed.

Conclusion: The Mutual Becomings of Scientific and Bodily Practices

The process of learning to exercise, and to work with a new and growing body, becomes a process of acquiring the body, appropriating it – and thereby appropriating a new, richer world: a world of new opportunities, ways of experiencing, moving and being in the world.

The trial becomes a device that induces new relations between body, mind and selves (Despret, 2004). The trial also offers the

participants the opportunity of becoming good health subjects, and the participants enable the staff to be good scientists, which means they develop new forms of being together (Despret, 2004: 122). They learn from and with bodies, and they adapt scientific practice to bodily and everyday experience.

The trial provides insight into important knowledge on the participants' personal, social and physical experiences from their everyday lives before, during and after their pregnancy. With this shift of perspective, the trial becomes an apparatus for knowledge production in a wider sense: it becomes an apparatus for the production of more robust knowledge – knowledge on how to become together, and how to learn from each other in the mutual process of domestication (Despret, 2004). We understand this domestication as a process of mutual adaptation and relation work: the process of learning to read, understand, anticipate and accommodate each other in workable and working relationships. The trial becomes a better trial, because it is domesticated by its participants, who offer insights, collaboration, resistance, emotions and bodily fluids in order to make it work. This conceptualisation of mutual domestication and becoming could be a useful reconfiguration of clinical trials and health interventions, to get a better understanding of how we become more knowing together.

Inspired by Latour's understanding of the body as a becoming phenomenon enriched by interactions with differences, we have investigated how the participants learn to re-enter into the world as pregnant women; how they *learn to be affected* by and how they navigate within differences in health advice, knowledge, attitudes and materiality regarding pregnancy and motherhood. How they take part in and interact with these differences as a process of learning and attuning. We have addressed this learning as a process of becoming a pregnant (some)body. This learning may relieve confusion, insecurity, doubt and concern. FitMum enables the practice of attunement as a shared responsibility. The competence for tuning in – feeling, listening – becomes familiar with the signals of the body, working with, not against it. Not forcing or straining or pushing beyond your limits, but finding the limits, perhaps softly challenging them. In this case learning to be affected is a mutual process where staff, FitMum and the pregnant participants become entangled in a collective of bodies, tests and technologies. It is a constant navigation, which requires continuous selection and deselection of different forms of affective

components (Jespersen et al., 2014). This collective for some constitutes a useful, reassuring navigation, whereas for others differences may cause confusion and insecurity. Health authorisation is not a simple one-way process in which the pregnant women smoothly change lifestyle and incorporate improved health practices in accordance with standard recommendations. It is rather a process of continuous attunement in which the women learn to be affected by the attitudes, sensory input and materiality that surround them. Simultaneously, the trial also learns to become attuned to the women, their conditions and ways of living, which feed back into the trial setup in a dynamic relationship. This means that health competence is not acquired once and for all, or something that is developed in vertical relations, but is rhizomatic and entangled. It must be maintained, nurtured and developed through continuous negotiations, adjustments and adaptations to the changing circumstances of the health subject taking social relations, everyday life aspects as well as embodied experiences into account. Becoming a health subject is a complex process of assessing, re-assessing, and negotiating different kinds of knowledge, feeling and trying, seeking advice and support in order to find a situated approach. It is not a simple one-way creation of health subjects: it is a mutual process of becoming; of learning to be affected by each other and by differences (Latour, 2004). The outcome of the trial becomes not only to produce specific clinical knowledge on the effects of different doses or regimes of exercise, but also showing how we can learn to become affected, and how we can collectively explore sensitive and attuned ways of being and becoming.

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