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# Picture Perfect: '4D' Ultrasound and the Commoditisation of the Private Prenatal Clinic

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## Abstract

Non-medical '4D' ultrasound is commercially advertised as promoting maternal 'bonding', providing reassurance, and tendering entertaining experiences for expectant parents. Despite the proliferation of this technology, it has not yet been subjected to sufficient social scientific attention. Drawing on an ethnography of a private prenatal clinic in the UK, I explore how 4D scans, providing detailed real-time images of a foetus, have transformed the prenatal clinic into a site of consumption. I argue that the discourse present in 4D scans and the materiality of the clinic achieve two things. First, it blurs the boundary between clinical and nonclinical practices. This must be carefully negotiated by professionals who perform serious emotional labour to balance the delicate tension of offering expertise and medically-based reassurance with providing a joyful experience for parents as consumers. Second, the 4D scan and clinic's materiality promote the notion of 'perfection', particularly around the idealised family and future body. I conclude by reflecting on how such non-medical technologies play a central role in the commoditisation of pregnancy, bodies, the family, and prenatal care in an increasingly consumer-led market.

## Keywords

4D ultrasound, body, commoditisation, emotional labour, healthcare communication, non-medical technology, parenthood, pregnancy, reproduction

## Introduction

The social, cultural, ethical, and political implications of foetal ultrasound - a routine and expected part of pregnancy in many areas of the world (Mitchell and Georges, 1997) - have been subjected to an intensive sociological gaze for around twenty years (Draper, 2002; Mitchell, 2001; Roberts, 2012a; Taylor, 2008). Commentaries on visualising the pregnant-body interior claim that ultrasound offers a chance for meeting the baby (Williams et al., 2005), medicalises a pregnancy and erases women in favour of unborn babies (Martin, 1998), devalues women's knowledge (Sandelowski, 1994), represents a foetus as a separate and conscious agent (Mitchell and Georges, 1997), forces parents to tackle moral dilemmas (Rapp, 2000), makes pregnancies seem more 'real' in the absence of embodied knowledge (Williams et al., 2005), and prompts behavioural changes in a partner befitting that of a future parent (Draper, 2002). In short, ultrasound imaging allows parents to reflect on, and rework,

their experiences of pregnancy by providing a way of knowing and feeling the foetus through the coupling of human and machine (Mitchell, 2001; Mitchell and Georges, 1997). It is clear, thus, that ultrasound has changed beliefs and values around the relationship between expectant parents and the foetus (Barnes 2013).

In this article, I attend to the 'consumption' of ultrasound (Taylor, 2008) and specifically 4D ultrasonography. Described as 'non-diagnostic' (Chisholm, 2011) or 'boutique foetal ultrasound' (Raucher, 2009), 4D ultrasound provides detailed real-time images of a foetus, is available around twenty-four to thirty-two weeks gestation (local variations are possible), and often culminates in the production of detailed photographs and 'keepsake DVDs' of an unborn baby (Gammeltoft, 2007). Both '3D' and '4D' scans have been debated together yet it is important to make a distinction; 3D scans produce three-dimensional images and 4D scans are moving images of unborn babies (the fourth dimension is time). The 4D technology is universally advertised as stimulating maternal 'bonding' (they are sometimes referred to as 'baby bonding' scans) and providing reassurance and an entertaining experience for parents. Using ultrasound for non-medical purposes has been condemned by some medical organisations (Society of Diagnostic Medical Sonography; American Institute of Ultrasound in Medicine; The American College of Obstetricians and Gynaecology), whilst the Royal College of Obstetricians and Gynaecologists have promoted the positive medical justifications of the procedure (i.e. obtaining a clear picture of foetal growth), even if recognising that the significance of these activities remains unclear.

Despite the proliferation of 4D ultrasound, few have paid sufficient attention to its social, cultural, and political implications, although Roberts (née Palmer) and Kroløkke provide notable exceptions (Kroløkke, 2010, 2011; Palmer, 2008, 2009; Roberts, 2012a, 2012b). Some others have discussed 4D ultrasound in relation to mothers' experiences of the technology (Simonsen et al., 2008), its complicity in the domination of women's bodies by medical science and state institutions (Denson, 2008), and the shift ignited in the ways we view and value the 'iconic' foetal image as a prenatal commodity (Chisholm, 2011). In the medical/scientific profession, writers have examined 4D ultrasound with regard to the importance of conceptualising 'bonding' (Campbell, 2002), how scans threaten the authority of medicine (Raucher, 2009), and whether using medical technology for recreational purposes is improper practice (de Crespigny et al., 2009). However, few scholars have studied, particularly ethnographically, how it is performed and how it has transformed the prenatal clinic into a site of consumption. This feeds into an observation of the literature, namely, that pregnancy and reproduction have rarely been explored with respect to consumer practices, excepting the literal sense of consumption such as eating or taking medicine, or even consuming medical advice (Theodorou and Spyrou 2013). This almost complete absence of pregnancy and ultrasound in work on commercial consumption and consumer theory, excepting the work of Taylor (2008) and Mitchell (2001) among a select few others, is addressed in this article, shifting the focus away from individualistic conceptions of consumerism towards it as a relational act.

Drawing on an ethnography of a privately-funded clinic and interviews with professionals, I argue that the discursive exchanges in ultrasound scans and the materials and space of the clinic accomplish two things. First, they blur the boundary between the clinical and nonclinical dimensions of this technology. In 4D scans, reconciling clinical care with entertaining performances emphasises the tension between the social and medical meaning of ultrasound and the commoditisation of professional practice. Second, 4D ultrasound and the clinic's materiality appear to inadvertently promote the notion of 'perfection' and both the idealised family and unborn body. Specifically, the ascription of physical features and movements of the unborn baby to gendered personality traits and

favourable physical appearances fuels popular ideologies of expected and normal bodies, transforming the hope of perfection into a normative expectation. I conclude by suggesting that in a society fostering a climate of market-oriented consumption, 4D scans and similar artefacts create new subjects and social relations, and contribute to commoditising pregnancy, the foetus, the family, and prenatal care. This article will appeal to scholars of sociology, science and technology studies, and anthropology with interests around bodies, gender, reproduction, technology, and consumption.

## **Study and Methods**

I carried out fieldwork for around one year at Springtown, a privately-funded clinic situated in an affluent UK area. Expectant parents in Springtown can undertake a range of ultrasound scans including early pregnancy scans, nuchal translucency scans, growth and wellbeing scans, and cardiac scans. They concurrently offer 4D ultrasound scans. On entry, clients approach the reception desk and are directed to the waiting area containing one television, ten chairs, and a water cooler. Staff warmly greet parents (and frequently family and friends) and offer refreshments, a setting very different to the usual chaos of NHS prenatal departments. Springtown is a tiny space with plain corridor walls adorned with pictures of unborn and new-born babies. It contains three rooms: an ultrasound room, 'bloods' room, and consultation room. The ultrasound room contains an ultrasound machine, two chairs, a large television monitor, a computer, and two photographs of 'water babies'<sup>1</sup>. The ultrasound scan allows for the visualisation of unborn babies and measurement of their anatomy (and so gestational age). Images are displayed on a large screen as music plays. The scan, lasting for around forty minutes and costing £200, is recorded to DVD and still images are given to parents. Two consultants, five sonographers, and four nurses work here. One consultant or sonographer and one nurse will work each shift. The 4D scan is usually carried out by a sonographer (Esther, Heather, Lisa, Olivia, Sophie) or consultant (Dr Karman). The vast majority of professionals in Springtown were female, white, British, and were between the ages of 35-60. They mostly worked part-time whilst holding full-time employment at a local NHS hospital. All sonographers, excepting Heather, were trained in clinical ultrasound (Heather was only allowed to perform 4D scans here as these were defined by the institution as 'non-clinical'). Pseudonyms are used throughout.

In this article, I draw on observations of twenty-four 4D ultrasound scans and interviews with sonographers. Face-to-face interviews with sonographers were conversational, audio-recorded, and ranged from thirty minutes to over two hours. Questions invited professionals to reflect on their working practices, a means of observing how they see their own experiences, lives, and interactions with others. However, interviews were used primarily as confirmatory devices, that is, to locate and verify observations and conversations. I rely on observations to make most of my claims. Ethnography offers the best methodological and theoretical tools necessary for a sustained exploration of the interactional character of ultrasound scans, revealing the essential social and cultural character of the clinic. I relied on a grounded theory approach (Glaser and Strauss, 1967) using a thematic method to analysis. Material was grouped together to establish dis/connections in accounts and observations. Ethical approval was granted by the University Research Ethics Committee.

## **Threat or Thrill?**

In this section, I describe how the tension between the social and medical elements of 4D ultrasound are created and negotiated by professionals and parents in the everyday interactions of the ultrasound encounter. The fear among professionals about parents imposing personal interpretations

on the function and significance of ultrasound have been established (Draper, 2002; Mitchell, 2001; Sandelowski, 1994). Scans are well-recognised as a 'hybrid practice' (Taylor, 1998) with medical and social meanings incorporated into consultations, not least in installing an extra monitor for parents to 'watch' a baby and producing 'baby's first picture' (Mitchell, 2001). During ultrasound, parents can experience a range of conflicting emotions, with enthusiasm and enjoyment frequently sitting uncomfortably alongside fear and angst (Williams et al., 2005). Mixing biomedical purposes with social matters is a key component of 4D scans in Springtown; it is where the logics of 'care', the necessary basis of managing illness or a diagnosis, and 'choice', a concept foregrounded in policy and research where patients are seen as consumers and active decision-makers, intersect. In one Springtown flyer, 4D scans are described as:

[Producing] lifelike images like a moving statue allowing parents to clearly see their baby smile, yawn, blink or swallow as they move inside their secret world.

The unborn baby is categorised as a smiling, blinking, and moving human. In other artefacts distributed by Springtown, parents are told they will see '*their unborn child at play*' and '*bonding between parents and baby has been shown to be stronger when the 3D image is seen compared to the 2D image because the picture of the baby is more realistic*'. However, in conjunction with these social dimensions of the scan and the 'cultural valorisation of the visual' (Mitchell and Georges, 1997) are its medical dynamics. This is particularly true with respect to 4D scans being supplemented with a growth and wellbeing scan a Springtown to '*assess the baby's general health and growth, the amniotic fluid volume, and the placental blood flow*'. The medical and social purposes of the 4D scan are clear in the following extract from a consultation between Esther (sonographer) and Mr and Mrs Cross:

Esther: We're not screening or doing anything diagnostic today. I'm not here to detect an abnormality but I'll say if I see anything.

Mrs Cross: Okay.

[Esther switches on the music and screen. As the scan starts, she uses the cursor to direct the Cross' gaze]:

Esther: Here's your little one. There's the mouth, eyes, hand, arm.

Mrs Cross: [Looking at stomach] Do not perform today!

Esther: See the up and down movement? That's the breathing. Mouth, eye, nose, and the stuff touching baby's head is the placenta. That's the placenta over the top there.

Mrs Cross: Is that looking okay?

Esther: It looks great. Here are the chubby little cheeks.

Mrs Cross: Aw. Look, she's got a face! [Everyone laughs].

Mrs Cross: Do we get pictures today?

Esther: Yes. [...] Do you think baby looks like one of you?

Mrs Cross: You can't really tell can you? I can't see the face. I want to see if she has dimples like me.

Esther: There's the eye. Sometimes it opens too.

Mrs Cross: I was going to say if that's the eye.

Mr Cross: I see it too. [...] It's incredible you can do this now, isn't it?

Esther: Yes. The 4D foetal heart scans are fantastic as well. I don't want her to put her head back as we won't get good pictures. Now she's putting her hands in front of her face. Don't do that, baby!

Mrs Cross: She does that constantly. [...]

Esther: She's got a thing about her hand. She's gnawing on it constantly!

Mr Cross: Is she yawning?

Esther: Yes. [...] What a lovely baby. I'm going to do the growth scan now [switches to 2D scan]. Your placenta is on the back wall here.

Mrs Cross: Is that where it should be?

Esther: Yes.

[Esther completes measurements and explains them, along with some percentile graphs, to the Cross']:

Esther: Baby's falling along the normal percentile. Average. So perfect.

Esther begins the scan by identifying its non-diagnostic capacity, a distinction she repeats at the beginning of all scans. On occasions, she emphasises the scan is for '*fun*', '*bonding*', and '*just to see the baby*'. The idea of bonding is central to maternal discourses; in the age of prenatal technologies, maternal attachment – once considered '*natural*' – seemingly cannot be left to nature and women (Mitchell and Georges, 1997). With Mr and Mrs Cross, Esther promotes the social dimensions of the scan by switching on the screen/music, establishing features such as '*chubby cheeks*', and invoking familial relations ('*do you think baby looks like one of you?*'). The imaging on the screen is made personally and socially meaningful via the '*collaborative coding*' (Roberts, 2012) of Esther and the Cross', with the latter contributing to *making* the baby in interactional exchanges ('*look, she's got a face!*', '*I was going to say if that's the eye*'). The ultrasound encounter can be described as an example of '*bio-tourism*' (Kroløkke, 2011), in which sonographers become hosts and parents become visitors in the foetal world. Mrs Cross asks for ultrasound pictures, symbolic artefacts allowing for consumption outside the clinic (parents often say they will share photographs with family/friends and on social-networking websites). Esther makes a concerted effort to '*get good pictures*', urging the baby to '*[not] do that*'. On this point, the consumer-driven character of the clinic is reflected by discounts and/or new appointments being offered should a baby not '*perform*' and provide a pleasurable experience and '*good*' pictures<sup>2</sup>.

The atmosphere throughout much of the encounter, like the majority of other scans, is jovial; Esther and Mr/Mrs Cross laugh, distinguish foetal features, and playfully scorn the baby for not '*performing*' correctly. But despite the social dimensions of the procedure taking precedence, Mrs Cross seeks reassurance and re-invokes its medical character, namely by asking if the placenta is '*looking okay*' and '*where it should be*'. The notion of reassurance comes from ultrasound's function as a prenatal diagnostic technique (Mitchell and Georges, 1997) and is a consistent theme in many scans which seemingly contradict the procedure's '*bonding*' purpose. Whilst the primary function of 4D scans is to offer parents an enjoyable experience (professionals often talk to parents during scans about other forms of consumption such as music tastes, shopping habits, and food), they can encounter considerable fear and worry once confronted with their bodily interior. Exclamations of delight and excitement sit alongside patients' medical-based queries and sonographers' statements. Examples of professionals invoking medical dimensions include establishing heartbeats ('*there's the heartbeat which is the most important thing*') and ensuring the pregnancy is progressing as expected ('*so is everything okay with your pregnancy?*'). Examples of parents aligning with the medical elements

of 4D ultrasound include asking about foetal size and weight (*'is the baby the weight he should be?'; 'We mostly had the scan to check the size and see if everything was okay'*), structural features and organs (*'are the bones in tact?'; 'is the thyroid okay?'; 'can you have a close look at my placenta as I'm 44 years old and I'm a little worried?'*), and less-specific concerns (*'I was a bit worried [...] I just want a normal sized baby'; 'but the baby looks healthy apart from the stubbornness?'; 'We wanted to check in case there was some major crazy facial defect!'*).

Here, there is a 'clashing of world-views' (Draper, 2002: 787) between the lay paradigm of the ultrasound scan as a social event – in which parents are 'shown' *their* baby (Mitchell and Georges, 1997) – and the expert paradigm of it as a medical tool. Although professionals are aware of the 4D scan being a primarily 'social' technology, its medical dimensions – thus requiring expertise – are often brought to the forefront, either by them or parents. This blurring of the social/medical boundary is more profound if a foetus has a structural defect such as cleft lip/palate. In the medical profession, some have praised 4D scans for diagnostic accuracy when foetal defects, especially defects requiring surgical interventions like facial clefts, are suspected or evident (Cadogan et al., 2009). Consider this extract from a 4D scan between Esther (sonographer), Mrs Clayton (mother), Mrs Clayton's mother and Mrs Clayton's daughter after an initial diagnosis of a unilateral cleft-lip:

Esther: Hopefully this makes things clearer for you. Your imagination is often much worse than it actually is during a pregnancy.

Mother: Definitely.

Mrs Clayton: Yes.

Mother: My son who's sixteen now had exomphalos (abdominal wall defect) when he was born and he was fine.

[Baby is not in the best positioning for imaging].

Esther: Baby has decided not to cooperate for me today. She's a stubborn one! I'll try my best for you to see the cleft and get a picture so you can see exactly what it is. [...] I can see a left sided cleft here. If she can get her arm out of the way, we might be able to see it better. This is the arm and that's the face. There's the cleft [pointing with cursor]. Do you see baby looking around? That's the lens there.

Mrs Clayton: Yes. Oh my gosh.

Daughter: Layla!

Mother: Come on. Say come on, move Layla!

Daughter: Move Layla!

Mother: Is she moving?

Daughter: Yes!

Esther: Yes but the only thing she's not moving is an arm!

[...]

Mother: Oh my God she's doing yoga [everyone laughs]!

Esther: You can see the side of the mouth but not the cleft now. Come on sweetie.

[Baby seems to yawn].

Esther, Mother, and Mrs Clayton: Aw!

Esther: The tongue is going there. There it is, the cleft.

Mother: Oh it's not that bad.

Esther: I've been scanning a long time and I've seen a lot worse than this. It's not that bad at all.

Mother: It really isn't.  
 Esther: It's unilateral.  
 Mrs Clayton: What does that mean?  
 Esther: It's on one side.  
 Mother: It's tiny, it's not a problem.  
 Esther: I can see the edge of the nose there. The surgical work they do now is incredible. There it is [points].  
 Mrs Clayton: [Pointing] There?  
 Esther: That's it.  
 Mrs Clayton: Oh it's tiny.  
 Esther: The other side is perfect as well. Look at her, she's gorgeous.  
 Mrs Clayton: That's a relief.

The blurring of the social/medical in this consultation is profound: Mrs Clayton's anxiety, the gentle urging of the 'stubborn' baby 'doing yoga', conveying amazement at the imaging on the monitor ('aw'), the laughter, the *making* of the baby via naming ('Layla'), and the reassurance efforts of Esther and the mother ('*your imagination is often much worse than it actually is*'; '*my son whose sixteen now had exomphalos when he was born and he was fine*')<sup>3</sup>. These efforts are evident towards the end of the consultation, with Esther drawing on her expertise to alleviate Mrs Clayton's anxiety ('*I've been scanning a long time and I've seen a lot worse than this. It's not that bad at all*') and identifying the '*incredible*' surgical interventions. Mrs Clayton accepts the definition of the cleft as '*tiny*', describing the encounter as a '*relief*' after Esther calls the baby '*perfect*' and '*gorgeous*'. In another consultation, Esther describes the same defect as '*a little cleft*' and ascribes the lack of visibility to it being '*very small*' and '*treatable*' via current '*wonderful*' surgical skills, alleviating angst further by claiming '*I've been scanning before [author] was even born I think and I can say that this is not a huge, massive cleft at all*'. In such situations, parents often have no experience or reference on which to base an imagined impression of the abnormality. As such, 4D scans become normalising technologies which allow professionals to reassure parents and accomplish the baby once more as 'normal' or 'perfect'.

Nonetheless, far from the 4D scan being a purely (or at least primarily) social encounter, invoking medical expertise is equally important for some parents, thus further blurring the boundary between the clinical (reassurance, diagnostic work) and nonclinical (joy, excitement) elements of 4D ultrasound (Taylor 2008). What is more, the two extracts above highlight the importance of sonographers' personal/emotional labour during such encounters. I build on this point below.

### *Emotional Labour*

The fracturing or distortion of the social/medical dichotomy during ultrasound is tricky for sonographers who must balance authentic/entertaining experiences with clinical expertise to reassure and pacify parents. Esther refers to 4D scans during several consultations as '*reassure-a-grams*' yet interestingly, many professionals are highly critical of the procedure unless used for cleft lip/palate. Francine (nurse) explains:

I don't like 4D scans. I think they have their uses, especially if babies have clefts, facial anomalies, or missing limbs. [...] For a lot of people they can't visualise anything and they'll go into extremes of thinking "it's going to be born with this claw hand". So it has its uses but just



having it as a memento? No. [...] I find them weird. [...] I don't think they increase bonding either. And I'm not being funny, but who's going to watch the DVD?!

Similarly, Esther recognises the benefits of 4D scans following a diagnosis of a cleft lip/palate. In one consultation following a cleft lip/palate diagnosis, she explains to the parents that '*most people think it's twenty times worse in their heads so that's why we do this scan, to erase some of those fears*'. She highlights the benefits of 4D scans during an interview:

If you can get a good view of the baby's lip, it's about encouraging them to see it's not as horrendous as they thought it was, it's manageable, and I always say to the women "it doesn't look particularly big to me" so you can help to allay the awful fears that they must have.

However, in a wider critique concerning the allocation of healthcare resources, Esther censures the '*mercenary approach*' and '*money-making exercises*' of Springtown when claiming she is '*not for 4D scans*'. She also highlights how the safety and power of ultrasound is unclear, with parents not being told that '*the amount of power that's used to do this is a lot more than is applied during regular scans*'. Following a consultation, Sophie similarly describes 4D scans as '*creepy*' and explains:

It was a culture shock coming here from [NHS hospital]. I was told to try harder to sell other scans to patients and partners. So if a patient has paid for one scan, we're supposed to ask if they've considered others. It brings up all sorts of dilemmas. Me and [the sonographers] don't feel very comfortable about it.

Professionals' experiences of 4D ultrasound are frequently neglected, although Mitchell and Georges (1997) capture how translating diagnostic ultrasound imaging into a 'cyborg foetus' becomes fatiguing. Sophie's discomfort concerns offering a multitude of different scans but the idea of specifically '*selling*' 4D ultrasound troubles her and others.

Owing to the commoditisation of care and pregnancy, sonographers must engage in two forms of 'emotional labour' (Hochschild, 1983) in Springtown. First, as shown earlier, they work hard to reassure parents and repair potentially fractured encounters via interactional exchanges emphasising the baby's 'normality' ('*he's normal, perfect*') or favourable features ('*chubby cheeks*'), drawing on their own professional expertise ('*I've been scanning for years and years*'), and emphasising the alleged rarity of problems ('*nature has got this all worked out most of the time and it takes care of everything*').

But sonographers also *put on a show*. Skilfully and enthusiastically involving parents in the scan whilst erecting a lively, homely, and pleasant atmosphere is widely encouraged, comforting parents in a situation where silence may be indicative of prospective problems. Because Springtown, as described by one administrative professional, is '*first and foremost a business*', sonographers operate under an ethos of individual consumption where they tailor treatment (in line with a recognisable cultural script) and invoke great empathy for clients who cannot leave disappointed. This includes apologising to parents for not producing clear photographs or putting on an object performance; '*I feel bad when [they] pay all that money and baby doesn't want to behave*' (Esther).

Extending Twigg et al.'s (2011: 171) concept of 'body work', roughly defined as 'paid work on the bodies of others', Kerr (2013) suggests that in privately-funded settings, care is overtly organised around consumption and professionals must negotiate the tension between medical care and consumer choice. In Springtown, professionals' imperative to merge medical information with a

consumer-friendly performance (small talk, laughing, playing 'hide and seek' with and pointing out positive attributes of the baby, drawing smiley faces on the abdomen with ultrasound gel) means that they carry out significant emotional labour to *'perform'*, using Esther's discourse, during a procedure of which they are highly critical. This corresponds to the second form of their emotional labour, namely, suppressing criticisms of 4D scans as *'weird'*, *'creepy'*, and possibly unsafe. This feeds into their wider discomfort with selling products to parents, the implicit criticism being such artefacts are designed to capitalise on possibly anxious and vulnerable parents.

I have identified how the muddled distinction between the social and medical character of ultrasound, as a consumer practice, is negotiated by parents and professionals. Moreover, I capture how this implicates professionals who must engage in serious emotional labour in order to pacify parents and quash their own discomfort with the commoditisation of their practice. In what follows, I explore how discourses and materials of the clinic, particularly with respect to 4D scans, collude to produce ideas around perfection and the idealised body/family.

### **Producing Perfection: Ideal Bodies and Families**

What constitutes normality and perfection is largely built into everyday language. Indeed, both categories are cultural artefacts contingent on social and historical framings rather than being universal givens. During scans, the pursuit of perfection is (re)accomplished in discourse, especially since sonographers must tactically transform the chaotic imaging into babies and expectant parents into fathers/mothers (Kroløkke, 2011), thus constructing particular identities for both the foetus and parents. This work allows the expectant parents to participate in the encounter and, thus, *consume* the imaging on the screen as their baby. The following extract is from a consultation between Mel (sonographer), Ellie (nurse), and Mr and Mrs Cartwright (parents):

Mel: You can see his nose there, his hands. Come on, put them down now [Mr and Mrs Cartwright laugh]. There's your baby.

Mrs Cartwright: Oh my God. I can't believe it.

Mel: Wow.

Mrs Cartwright: That's a proper picture!

Mr Cartwright: [Laughs] It's unreal.

Mrs Cartwright: It's mad, it's crazy. I didn't think it would be this good.

Mel: Sometimes they aren't this good. We get some really naughty ones.

Mrs Cartwright: He's been really good in all his scans so far actually. He's been behaving. Oh my God. His lips are so clear, aren't they? He's got big lips hasn't he?

Ellie: It's like you could give him a big kiss.

Mrs Cartwright: Definitely. That's crazy. [...] He actually looks like a baby.

Mr Cartwright: Funny that isn't it!? [Everyone laughs]

Mel: There's one of his hands.

Mrs Cartwright: I see it.

Mr Cartwright: He's gone for his nose now!

Mrs Cartwright: Has he got his eye open?

Mel: Yes.

Mrs Cartwright: And he's got his hand up there?

Mel: Yes. And his feet now.

Mrs Cartwright: Look how chubby he is!

Mr Cartwright: Chubby [laughs]?!

[...]

Mrs Cartwright: Aw he's so cute. [Turns to Mr Cartwright] He's cute isn't he?

Mr Cartwright: Yes.

Mrs Cartwright: I knew he would be. Why's the yawning all the time? He's like me!

[Mel explains she will do the growth scan. The room is quiet during this period].

Mel: The measurements are all perfect for your dates. And from what I can see, it looks like a boy.

Mrs Cartwright: Great. We wanted a boy.

Mel: [Mel switches onto a new screen showing a blue/red flow animation] This is the blood flow from your placenta. That's lovely. There's plenty of blood flowing through the cord. We can go back onto the 4D now [Mel switches back to 4D].

[...]

Mrs Cartwright: It's been worth having hasn't it?

Mr Cartwright: Definitely. It's unbelievable.

Mel: It's a brilliant birthday present, isn't it?

Mrs Cartwright: Yes.

Mr Cartwright: His hands are up. He's gone shy again!

Mrs Cartwright: And he's yawning again. Why's he so tired?

Mr Cartwright: He gets that from me!

Mrs Cartwright: I can't wait to show them in work!

[...]

Mel: You've got some great pictures. I think he's had enough of us now.

Mrs Cartwright: Yes he's probably thinking "stop prodding me! What the hell is going on?!"

[...] So he's perfect yes? So nothing can go wrong now then can it? Is it definitely all going to be okay?

Mel: Well never say never. But here, you can see from the scan that he's okay and absolutely beautiful. Here are the pictures.

Although both parents seek reassurance ('*so nothing can go wrong now then can it?*') and the room remains quiet during the growth scan, all parties in the room construct the scan as an enjoyable encounter and '*brilliant birthday present*'. As well as assembling the (perfect) baby via interactional exchanges ('*he's so cute*', '*he's been behaving*', '*big lips*', '*chubby*'), Mr and Mrs Cartwright engage in what Kroløkke (2011: 26) defines as '*ultra-gasms*', utterances conveying a sense of amazement at the ultrasound imaging ('*aw*', '*oh my God*', '*that's crazy*', '*unreal*', '*mad*', '*unbelievable*'). Descriptions observed during other scans include '*amazing*', '*incredible*', '*brilliant*', and '*perfect*', as well as more ambiguous descriptions such as '*weird*' or '*bizarre*'. This seems to contradict popular claims, particularly in feminist literature, that ultrasound erases women in favour of the foetus. Here, and in other scans, the parents are active participants, rather than disembodied onlookers, in co-creating the baby and recognising maternal features such as '*pillow*' placentas, '*penthouse*' uteruses, and cervixes to '*dance on*' (all sonographers' discourse). Mrs Cartwright explicates her delight at publicly displaying photographs/a DVD of ultrasound imaging ('*I can't wait to show them in work!*'), with Mel highlighting the public character of the unborn baby by suggesting they have '*some great pictures*' of their new family member.

In this consultation, the Cartwright's engage in what Becker et al. (2005: 1300) call 'resemblance talk', meaning words and discussions about relatedness establishing what family is and which become an outward bodily expression of biological relationships ('*Why's the yawning all the time? He's like me!*'). This is very common during scans as shown in the following consultation between Mel (sonographer), Mr and Mrs Kerry, and Mrs Kerry's mother and father.

Mother: My other daughter had a 4D scan and the babies look exactly the same.

Mrs Kerry: I can feel him kicking!

Mel: Look at his little nose.

Father: The nose is just like Sophie's [other granddaughter].

Mother: They look so similar, the three of them. You wouldn't know the difference. Their little cheeks!

Mel: He's active!

Mrs Kerry: I can feel him kicking at the bottom.

Mr Kerry: He's going to be a footballer!

Father: A [local football team] footballer!

Mother: He's living every goal!

Mrs Kerry: He's quite rhythmic as well. I think he's going to be a musician.

This scan becomes a key familial event with grandparents in attendance as well as the partner, a common trend with 4D scans (children are often in attendance too). The Kerry family accomplishes family via interactional exchanges. Morgan (1996) identifies family relationships as processes which are fluid, complex, and subject to adjustment. Family is a symbolic rather than 'natural' or exclusively biological driven cultural system yet great significance is still attached to genetic or 'blood' relationships (Rapp, 2000). Such 'family practices' (Morgan, 1996) emerge in the ultrasound room. Sonographers construct the imaging *into* a baby by drawing on visible markers of personhood and familial resemblances, thus 'weaving the foetus into a network of kinship relations' (Mitchell, 2001: 134).

Parents are bestowed an arena in which other family members not only attend but welcome a new family member and recreate a family narrative. Familial exchanges are encouraged via the identification of anatomical features replicating either or both parents ('*he looks like you, [child]!*'; '*I spent a lot of time in previous scans trying to identify similar features to [child] but I can see he's chubbier and got a bigger nose*'; '*He's got chubby cheeks like you, Mum!*'; '*He's got your mouth, I can see it!*'; '*He's yawning like me*'). This can be playful, with women often teasing partners about what they perceive to be unfavourable features ('*I hope she doesn't have your nose!*'). On two occasions, however, this was a serious concern for women who had split with their partner and did not want babies to share their physical attributes.

Movements, or lack of, can also be attributed to familial traits; in the case of limited movement, Esther often asks who has the '*stubborn gene*'. Another way of *consuming family* in the 4D scan includes sonographers occasionally typing 'Hi [child name]' and 'Hi [grandmother and/or grandfather names]', or replacing 'hi' with 'see you soon', onto monitors and printing images with this caption to share with the respective family members.

What I argue here is that such playful practices construct the ideal body and the ideal (nuclear) family. This is further accomplished by ascribing foetal movement to physical and personality attributes based on heteronormative gender stereotypes (but only if parents want to know the sex).

For instance, whilst female babies moving quickly are often described as ballet dancers or gymnasts (and as 'sweetie', 'stubborn', 'posers', 'shy', 'dolls'), males performing in a similar way are defined as footballers or musicians (and as 'trouble', 'naughty', 'dark and handsome', 'show-offs'). Thus, there is evidence of a 'gendered, conscious, and sentient foetal actor' (Mitchell and Georges, 1997: 397) in the ultrasound encounter.

This 'gendering' (Kroløkke 2011) is both playful and located in a framework of stereotypic expectations of appearance and conduct (Mitchell 2001). Mitchell and Georges (1997: 389) claim foetal personhood can be read through 'signs of physical normalcy and foetal gender' following culturally and historically specific 'scripts', so that the foetus becomes meaningful as a 'baby'. Here, the ascription of personality traits, gender expectations, and behaviour – alongside the presence of friends and family members – frames the procedure as an enjoyable expedition as opposed to a medical examination. In addition, it accomplishes the production of both ideal and expected bodies and families. This construction, and consumption of, the 'perfect' baby emerges not only through reassuring utterances of '*normal*' and '*perfect*' – along with the recreation of family narratives – but also through the cultural materials and space of the clinic.

Thinking socio-technically, the pathways and flows of Springtown are symbolic in relation to the pursuit of perfection during a pregnancy. After every scan, for instance, parents are tendered a picture of their unborn baby. Obtaining a picture is a key moment in the pregnancy ritual. Producing such materials not only help construct and maintain identities but also accomplish ideologies around the perfect baby. The meaning of materials/space in Springtown is captured in the following field-notes, the first passage taken from my first day of fieldwork and the second from approximately five months into the study:

Pictures of unborn and new-born babies are plastered around the clinic. [...] Lisa (sonographer) takes me into the ultrasound room. It is approximately 4x4 meters. The room is dark and contains three chairs, a trolley, a computer, and an ultrasound machine. The room's walls are adorned with two images of 'water babies'.

A '5D-photo stand' greets me as I enter the clinic. I have not seen this before. The products on display are 3D-photo-laser engraved crystal glass objects, in a variety of shapes and sizes, depicting images of unborn babies, new-born babies, families, and a dog.

With walls adorned with idealised facial photographs of new-born/unborn babies (e.g. water babies) and offers of purchasable keepsakes to memorialise the unborn (e.g. 5D-photo stand), Springtown accomplishes ideals not only around the perfect (gendered) baby but also around the 'normal' future family. Images of cute faces and detailed expressions adorn the clinic walls and advertising leaflets distributed to parents.

This materiality of the clinic works with discursive exchanges in the scan room to construct the normal/perfect family and baby, namely, he/she with desirable physiological traits such as '*cute toes*', '*little hands*', '*Buddha bellies*', '*button*' or '*dinky*' noses, '*big*' or '*pouty little*' lips, '*great smiles*', and '*big beautiful eyes*' among others. In addition, they '*perform*', are '*wriggly*', and are '*nice and active*' when the camera rolls with their movement being playfully attributed to being '*active*', '*cheeky*', and/or '*naughty*' (or conversely '*well-behaved*'). Whilst one may interpret these as playful exchanges, which go through a 'cultural sieve' whereby professionals select the best and most reassuring features to highlight (Mitchell and Georges, 1997), I argue that they are deeply rooted in Western cultural

ideologies of perfection/normality which reproduce popular ideas about the idealised body and family. This is problematic as it produces, and arguably endorses, images of the expected nuclear family and the 'normal', gendered, and heterosexual child – images which are based on problematic cultural ideals, and shape bodies and families in ways which may not correlate with future outcomes. I argue that by offering parents an enjoyable and pleasurable experience where they can consume their baby, 4D scans contribute toward changing the hope of the normal/perfect child into a normative expectation.

## Discussion

I have examined how 4D ultrasound involves the orchestrated interplay between bodies and technologies as well as how such a practice is deeply embroiled in practices of consumption. Too few scholars have attended to this, although it should be acknowledged that the likes of Taylor (1998, 2008; Taylor et al., 2004), Mitchell (2001; Mitchell and Georges, 1997) and Roberts (2012a, 2012b) provide crucial contributions; 'one need not dig far to find confirmation of just how tightly interwoven ultrasound, pregnancy, and consumption are' in Western society (Taylor, 2008: 144). Similar to arguments already made in work cited above, I identify how by outing inner space, ultrasound objectifies fetuses, transforming them into babies for parents to enjoy and consume. However, this article goes beyond merely claiming that reproduction has increasingly become a matter of consumption which distinguishes the unborn baby as a consumable entity (and so a human/person) for parents and the family, as argued elsewhere (Taylor, 2008). Instead, I show how scans shift and complicate the boundary between the medical and social components of ultrasound. Sonographers must convince clients of their competence in order to reassure them, even if the social dimension of ultrasound is privileged. The commoditisation of ultrasound is particularly problematic for sonographers carefully negotiating this muddled binary whilst suppressing personal criticisms of 4D scans and other consumer practices (i.e. marketing goods) inside the clinic. There is an element of *performance* in many areas of healthcare professionals' work but this trend is considerably heightened in privately-funded care where the pursuit of profit is a prime and realistic objective. In what follows, I identify how the discourse (e.g. identifying positive foetal features, constructing family relations) and materiality (e.g. adorning walls with pictures of photogenic babies, offering purchasable keepsakes to memorialise the unborn) of the clinic and 4D scans promote the cultural category of perfection and create identities for the 'normative' child and family.

Taken together, the phenomena described here identify how pregnancy, the foetus, and parenthood have been increasingly commoditised and entangled in the politics of consumerism, which promote individual choice, in Western culture. This emerges inside the clinic and also outside its walls, for instance, via online daily-deal websites offering gift vouchers for 4D ultrasounds and by ultrasound being adopted by non-medical audiences. Therefore, I identify 4D scans – transforming expectant parents into mothers/fathers and fetuses into babies – and related artefacts as positioning pregnant women and the unborn as valuable commodities infused with cultural meanings and targets for marketing by commoditising bodies, intimacy, and forms of kinship and relationality.

In future work on 4D ultrasound, I would encourage a focus on motherhood and consumer practices. These are inseparable and mutual entities shaping each other in modern life (Taylor et al. 2004) yet constitute 'one of the great under-told stories of consumer culture' (Cook, 2013). One important exception is Pugh's (2009) ethnography on the pressures and complexities of parents raising children in a consumer society. She examines how choices are shaped by broad systems of inequality and a fruitful future line of analysis on 4D ultrasound scans could concern how women

perceive their participation in this consumer practice and how similar dynamics of class and income/privilege play out in such circumstances. What is more, I encourage research on how 'good' motherhood (Theodorou and Spyrou, 2013) is performed during 4D scans. The relationship between motherhood and consumption is hugely important, with products being seen as steps to assuming the (good) mother role and helping to construct social identities (i.e. as mothers and as children/babies). Ultrasound is an important type of care-work, a meaningful activity based on values and beliefs. As such, a critical exploration of the relationship between motherhood and consumption with respect to this practice, and if mothers feel they need to draw upon technological interventions to 'bond' with the baby, would be especially welcome.

Much like Pugh (2009), I resist engaging in moralistic judgements about whether consumption, with respect to ultrasound imaging in this context, is a fundamentally good or bad thing; I do not subscribe to the either/or argument, that is, that (female) consumers are manipulated by the market which capitalises on pregnancy-based anxiety or that they are clearly independent and market-savvy agents. Rather, I explore its *effects* in the prenatal environment, both for parents and the professionals delivering a service. Nonetheless, in this article, I argue that one must critically engage with modern consumer culture, as 'the very arena in which culture is fought over and licked into shape' (Douglas and Isherwood 1979: 57), when conceptualising prenatal care, pregnancy, family, and the foetus. In so doing, we can show how these phenomena intersect with the rapid progress of prenatal technology at both the local and global level. In short, we must take the pleasures of ultrasound seriously.

## Notes

1. The pictures show a young Caucasian male smiling and holding his new-born child. Both are underwater. Lisa (sonographer) explains that babies have a natural diving reflex and so avoid inhaling water into their lungs.
2. Imaging quality is dependent on gestation, foetal position, the number of foetuses, amniotic fluid, and maternal weight/tissue.
3. Reassurance can also be offered by partners (e.g. '*don't worry, he's only got a big head because I've got a big head!*').

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