In India, the politicisation of sex selective abortion has resulted in legislative measures designed to prevent the misuse of ultrasound for purposes of sex determination during pregnancy. In Australia, however, sex determination remains a largely unregulated component of routine ultrasounds during pregnancy. As an anthropologist, what I find interesting about this contrast is not that India "needs" regulation more than Australia, but that it is revealing of the assumptions surrounding people's use of ultrasound in these respective cultural landscapes. The truism that reproductive technologies are appropriated differently as they move through various socio-cultural contexts was the premise that drew me to investigate the use of ultrasound for sex determination in the context of my own culture, urban Australia, in preparation for a research project on similar issues in India. The lack of ethical debate on ultrasound and sex determination in Australia could be seen to reflect an assumption that Australian culture is one in which sex bias is negligible. Ethicists recognise that "obstetric ultrasonologists manage patients who present issues at the cutting edge of much current ethical debate." (1) The development of ultrasound technology has expanded the ability of ultrasonologists to detect markers of foetal abnormalities, generating new ethical dilemmas concerning patient counselling. However, the ethical imperatives of "nondirective counselling" and "patient autonomy" are aimed primarily at debating prenatal diagnostic issues surrounding medical abortion and the risk of foetal abnormalities. Ethical concepts relating to "social" medicine such as sex selection are secondary.

And yet, as with many other components of routine ultrasound during pregnancy, the decisions and experiences relating to sex determination have the potential to be both emotionally and morally fraught. As De Crespigny and Savulescu note, "the speed of development of prenatal diagnostic techniques has been little short of explosive" (1: 213), creating new ethical challenges for obstetric ultrasound. In the past, ultrasound technology was too unreliable for widespread practice of sex determination during pregnancy. The rapid development of the clarity of images has nullified this premise and the practice of sex determination - although still not definitive - is a popular component of routine ultrasounds conducted at 18-20 weeks of pregnancy. Social science analyses of ultrasound point to the ways in which the lack of definitive results using ultrasound for sex selection feeds into the perception that certain groups, particularly East Asian and South Asian women, are especially interested in the sex of the foetus (2, 3). Indeed, some sonographers told me of hospitals where they had worked, both in the UK and in Australia, where suspicions of sex selective abortions among minority populations had resulted in bans on the practice of sex determination. However, rapid advancements in the clarity of ultrasound images, and the absence of regulatory guidelines on the practice, have meant that sonographers in this clinic are charged with the responsibility for negotiating the practice of sex determination.

This paper details ethnographic research undertaken in the ultrasound department of a public hospital in Sydney, Australia during May-December 2007. This research is part of a larger PhD project, funded by an Australian Postgraduate Award, investigating the impact of prenatal diagnostic technology on the experience of pregnancy in India and Australia. Ethics approval for this research was obtained from both Macquarie University Ethics Review Committee (Human Research) and the Ethics Review Committee at the public hospital in Sydney. In this particular clinical setting, ultrasound is not performed for the sole purpose of sex determination. However, aside from this restriction, the practice of sex determination during routine ultrasound is governed neither by ethical guidelines nor by policy imperatives. In terms of bioethical issues, examining the practice of ultrasound and sex determination in the absence of formal regulatory mechanisms is useful for illuminating the process of what I call "everyday ethics." It has been recognised by the national bioethics body of Australia, the National Health and Medical Research Council, that "ethical conduct is more than simply doing the right thing. It involves acting in the right spirit, out of an abiding respect and concern for one's fellow creatures." We might imagine "everyday ethics" along these lines to be the day-to-day clinical activities that constitute a moral territory lying outside of formal ethics guidelines. I would argue that anthropology with its methodological focus on ethnography and everyday practice, is particularly well placed to study this unregulated territory and should play a much greater role in informing and expanding Australian bioethics debates beyond abstract philosophical discussions that tend to dominate the field at this point.

Based on data gathered through participant observation and qualitative interviews with staff and patients at the ultrasound department of the public hospital, I examine, in this paper, the pivotal role of sonographers in negotiating the moral territory of sex determination. In particular, I examine the everyday
strategies of sonographers as they deal with the emotional nature of the ultrasound scanning during pregnancy, and even enhance the emotional and personal nature of the images through what I call “meaning making” processes. Such processes are collaborative engagements with patients in which the ultrasound images are personalised. I give an instance in which “meaning making” inflects parental desire to know the sex. At the same time, sonographers may also engage in strategies to neutralise what they perceive as negative emotions in relation to sex determination.

Sex determination and gender in the Australian context

It is widely assumed that in countries such as Australia, the practice of sex determination during pregnancy is a non-issue. It is generally accepted that gender bias does not exist in Australian society, and this idea is also reflected in the lack of formal ethical regulations on the use of ultrasound for purposes of sex determination. Although sonographers complete an "ethics" course as part of their professional training, they do not cover the topic of sex determination and the possibility of sex selective practices as part of this course. As one trainee sonographer told me:

“It’s just not really a big issue because it just isn’t, so that’s why there are no materials to read...you know, ‘oh, what if you have a girl?’ - like, it’s no big drama.

However, the notion that sex selection is “no big drama” in terms of ethics is somewhat contradicted when we turn to the application of assisted reproductive technologies (ARTs) in Australia. In recent years, there have been extensive debates in bioethics circles on the subject of sex selection, particularly with respect to Pre-Implantation Genetic Diagnosis (PGD). Until 2005, a well-known private IVF clinic in Sydney (which also has an international client base) was advertising and providing sex selection services using PGD. They have suspended these services, pending further community debate, after the Australian Health Ethics Committee (AHEC) ruled that new reproductive technologies such as PGD should not be used for “social” sex selection until further community discussion takes place. The bioethics debates that underpin this ruling circle mostly around whether couples should be able to choose the sex of an embryo for “family balancing”. The discourse of “family balancing” is bolstered by a liberal choice rationale in which a family which already has one or more children of one sex should have the right to choose to conceive a child of the opposite sex (4). These debates are suggestive of a moral hierarchy in which engaging in sex selection to produce a family with both sexes is based on gender equality and is somehow more rational, and therefore less problematic than sex selective practices that emanate from a cultural preference for males (which is assumed to happen elsewhere, particularly in India and China). They also underscore the inherent difficulties in bioethical reasoning: liberal rationality and notions of “autonomy” are all too easily adapted to further arguments for couples’ right to choose the sex of their baby.

In these ways, sex selective practices constitute a site of contestation among bioethicists and medical practitioners in Australia, but they do so within the domain of new reproductive technologies. In fact, just as I began research on this topic, a press release announced the arrival of a new “Pink and Blue” DNA test which would theoretically enable consumers to test for X and Y (sex-determining) chromosomes within six weeks of pregnancy. A British company operating through web-based services offered the test “worldwide” – or at least to those “liberal” countries which did not have a preference for one sex or the other. The website invokes the company’s morality with assurances that they do not ship to India or China. Nevertheless, in Australia this “Pink and Blue” DNA test prompted public condemnation from the health minister, Tony Abbott, and outcry from pro-life activists who warned of the potential for sex selective abortion.

Against this backdrop, we might ask ourselves why ethical issues surrounding sex determination and ultrasound have not merited more attention. When I broached the issue with a long-time geneticist in the field, I was told that originally there were concerns about sex determination and ultrasound, but it came to be accepted that people just wanted to know “whether to buy pink or blue.” From an anthropological perspective, this “pink and blue” feature of sex determination during ultrasound is intriguing. It denotes a light-heartedness surrounding the expectations of a girl or a boy; the material decoration of nurseries, purchase of clothes and other accessories that form contemporary ritual preparations in the lead up to the birth. Yet this light-hearted conception of “pink and blue” does not adequately capture the degree of emotion that can accompany decisions and expectations that I found to surround the practice of sex determination during ultrasound.

“Pink and Blue” emotion

I can see why they come, feeling the way they do. And all they want to know is – you know one of the most exciting things is knowing whether it’s a boy or a girl, or, you know, deciding oh, we don’t want to know or...

I would argue that despite liberal proclamations of gender equality and neutrality with respect to preferences for one sex or the other, gender does in fact matter to people in the Australian context. For many pregnant women and their partners, the decision of whether to “find out” the sex can be a weighty one, and the results can sometimes provoke emotional outbursts during the ultrasound examination. As one sonographer described to me,

There’s people who’ve been really, really happy. And then, other people who’ve been just absolutely devastated and wouldn’t speak to me for the rest of the scan because they expected it to be the other gender. Completely irrational behaviour – but you know, people react differently. And I think that, often people have the expectations, they build themselves up and they think oh yeah, I’m sure this is going to be a girl, I can feel it in my water and I heard the heartbeat the other day. And the Internet told me that you know, if the heartbeat’s between 120 and 140 then it has to be female.
Again, we see here how sonographers can find themselves caught in the emotional nature of the practice of sex determination. We also see how bodily senses – “I can feel it in my water” – are implicated in the build-up of expectation about sex determination results. On a number of occasions, I found that following sex determination, people would reveal to me that the test had either confirmed or denied their “feeling” about which sex it would be. Among women who were pregnant with their second or third child, it was not uncommon for them to compare their bodily sensations to previous pregnancies in order to deduce clues about which sex they were expecting, saying “it feels similar this time” or “it just feels different.”

Many people have expectations about how one gender or the other will play out in terms of family dynamics. Following the news that he and his wife would be having a second boy, one husband who had been hoping for a girl said to me, “Hmmm, I have to get used to this news... well, I guess they can play football together,” showing how gendered expectations can structure the emotional processes that accompany the practice of sex determination. Sometimes these gendered expectations were bound up in assumptions of a baby’s likeness to a particular parent:

**Pregnant woman:** “Please tell me you can see a penis, we want a penis.”

**Sonographer:** “Why?”

**Pregnant woman:** “Cause otherwise they’ll end up like me.”

In this particular instance, the pregnant woman had presented at the ultrasound clinic with pain and was only 15 weeks pregnant, too early to see the sex according to the sonographer. The atmosphere during the ultrasound scan was filled with laughter and the couple were quite vocal about their emotions. The pregnant woman could barely contain her excitement when she saw the ultrasound images projected before her:

**Pregnant woman:** “Oh my God, is there a heartbeat?”

**Sonographer:** “Yup.”

**Husband:** “Can we have a photo of our baby?”

The sonographer humoured the couple and laughed along with them. The pregnant woman was clearly grateful for the sonographer’s good humour, and told her that she really liked coming to this hospital for the scan. She compared it to her last experience at another private scanning centre and said that this practice is also part of the process of “meaning making.” In the following conversation between a sonographer, a 19-week pregnant woman and her husband during a routine ultrasound scan we see that “meaning making” activity, as shown by the following ultrasound scan of a woman expecting twins:

**Pregnant woman:** “Is that number 2?”

**Sonographer:** “Yeah.”

**Pregnant woman:** “Hello number 2!”

**Husband:** “He’s got his arms up as well.”

**Pregnant woman:** “Good, good, it’s all good... It’s incredible.”

**Husband:** “You’ve got new names for them? They were A and B before!”

**Sonographer (speaking to the images):** “Get away! 1’s putting its leg over 2.”

**Pregnant woman:** “It’s started already. It’s such a weird thing because that’s their reality – forever a twin.”

Here we see how personalised meanings are attributed to the ultrasound images. Moreover, the sonographer participates in this “meaning making” exercise by speaking to the images as though they are babies that can respond to her commands. This “meaning making” in turn, prompts profound philosopising on the part of the pregnant woman about the realities of life as a twin, showing how ultrasound images are quickly incorporated into projections of expectations of family dynamics.

Given that sex determination is not part of the regulated medical requirements of the ultrasound exam, I would argue that this practice is also part of the process of “meaning making.” In the following conversation between a sonographer, a 19-week pregnant woman and her husband during a routine ultrasound scan we see that “meaning making” has the potential to affect people’s expectations concerning the sex of their baby:
Sonographer: “That’s the baby’s little head.”
Sonographer: “We’re just going to measure across the baby’s head and around it... Just looking inside the brain.”
Husband: “Hello bubba!”
Sonographer: “Just looking at the cerebellum at the back part of the brain, some bits are hard to see (shows the couple the nose and lips)... That’s the thigh-bone.”
Pregnant woman: “Is that to see if there’s any deficiencies?”
Sonographer: “No. Just to measure for gestational age.”
Husband: “You can’t tell if it’s a boy or girl.”
Sonographer: “Are you telling me or asking?”
Husband: “I don’t know, I don’t know if I want to know. (He turns to his wife.) Do you want to know?”
Pregnant woman: “I’m in two minds, as long as it’s healthy.”
Husband: “ Doesn’t matter so long as it’s like its dad. Bubba done good.”
The scan continued for some time and both partners were really emotional. They continued to repeatedly exclaim: “Wow!”
Sonographer: “Oh, see it rockin’ and rollin’ there. We look quite carefully at the baby’s heart because it’s actually quite small at this stage so we look at major structural abnormalities but you have to realise it’s not 100 per cent at this stage unfortunately.”
After taking extensive images of the heart, the sonographer showed the face of the baby, prompting an “Ooohh, wow!” from the husband who perked up considerably upon seeing the baby’s profile.
Sonographer: “Wait. Can you see its little tongue? Look, it’s having a drink.”
We watched the baby’s profile and it did appear that there was a tongue visibly flickering in and out of its mouth. All of a sudden, the husband seemed to make up his mind about wanting to know the sex:
Husband: “I think I want to know if it’s a boy or a girl. I think it’s a boy.”
Pregnant woman: “I think it’s a girl.”
Husband: “I guarantee it’s a boy. Let’s make a bet... if it’s a boy, I’ll shout you a trip somewhere. If it’s a girl you shout me. A trip to the Greek Islands or something?”
The pregnant woman agrees to the bet and they shake on it.

This exchange is interesting for the way in which it details this particular couple’s negotiations surrounding sex determination, as well as the impact of the mediated ultrasound images on these negotiations. The sonographer seamlessly alternates between explaining the features of the medical examination (“We’re just going to measure across the baby’s head and around it”) and translating the images in a manner that creates a sense of the baby’s personhood (“Can you see its little tongue? Look, it’s having a drink”), enabling the couple to engage in the “meaning making” processes of the ultrasound examination. In the exchange, the process of “meaning making” happens in relation to the decision of whether or not to find out the sex. While the pregnant woman invokes the health of the baby as her prime concern, and asks questions about any possible ‘deficiencies’, the husband is intently focused on the personhood of “bubba”. The husband is initially unconcerned about the sex, and is more preoccupied with the baby’s relative likeness to himself - “doesn’t matter, as long as it’s like its dad.” However, as the scan progresses, and the images seem to reveal more and more features of the baby’s personhood, the husband seems to be overcome with a sense that it is, in fact, a boy. In this case, the decision-making process in relation to sex determination seems to hinge on the ability of the ultrasound images to convey the personhood of the baby. This decision, moreover, is clearly nothing to do with a material notion of “pink and blue.” Rather, it seems to be inflected by the husband’s desire for his baby to resemble himself and the sonographer’s ability to translate the images in a way that allows him to relate to the ultrasound scans in a personal sense.

The decision of whether to find out is not usually negotiated during the ultrasound process. Most pregnant women and partners have thought a good deal about whether to “find out” in the lead up to their 18-20 week scans (the time when sex determination is usually practised at the clinic). The decision “not to find out” is not always shared by all family members, resulting in some creative means of distributing this seemingly potent knowledge. This was fairly straightforward if the woman herself was the only one wanting to learn the sex, because the accompanying partner could simply leave the room. However, in the instances where the woman was unwilling to find out, things were slightly more problematic and if the pregnant woman herself had any expertise at reading the ultrasound, she would have to look away. In most cases however, the sonographer would be required to surreptitiously write the information down on a scrap of paper for the other partner.

Interestingly, grandmothers-to-be often appeared to be one of the keenest to possess the knowledge of the sex. In some instances, women would try (in vain) to read the images while their pregnant daughters happily contained their desire to know. In one case, a pregnant woman told me that she would be having the sonographer write the sex down on some paper (paper which, incidentally turned out to be the Informed Consent form I had given her) that would be mailed to her grandmother in Queensland, and that she alone would be the one to know. She had also done this during her first pregnancy, and explained that her grandmother was worried that she might die before all the children were born.

Sometimes disagreements over the decision “not to find out” played out during the ultrasound scan itself:
Sonographer: “What about the sex - do you want to know?”
Pregnant woman: “There is a difference of opinion, but no, we’ve decided that we won’t find out.”
Sonographer: “More of a surprise that way.”
Husband: “That’s what I think!”
Sonographer: “Going to be one or the other - there aren’t too many choices.”
Pregnant woman: “No.”
Here we see how the sonographer is embedded in the matrix of emotions and uncertainty surrounding the practice of sex determination. We might also view this exchange as an attempt by the sonographer to play down the couple’s emotional responses. Strategies for navigating the emotional matrix during sex determination also emerged in the course of my interviews with sonographers:

1. Interview with sonographer (over 10 years’ experience):

Sonographer: “I have had people who are cross because you can’t see too. They desperately want to know and they’ll tell you for all sorts of reasons that they desperately need to know.”

VL: “That they need to know?”

Sonographer: “They need to know! More than anyone else needs to know. It’s usually you know decorating the nursery or, ‘You don’t understand we have to know’ - ‘You don’t understand we can’t see’ and some people you just can’t see... They all think they need to know more than someone else. My stock answer for that is that’s great for the sale of white, green, and orange clothes really. And that’s mostly the reason; they want to be able to tell people what colour clothes to buy.

2. Interview with sonographer (less than 5 years’ experience):

Sonographer: “I’ve had basically every situation you can think of. Patients telling their husbands to walk out of the room while they just want to know, or, you know, or people being disappointed in the room because they found out the sex wasn’t what they were expecting.”

VL: “How do they show that disappointment?”

Sonographer: “Oh, it’s pretty obvious! But um, you know, you just don’t comment on anything they say. Or you can actually say to them, and say, ‘Well look, what I’ve just told you is not 100%, so don’t make any permanent changes in the house just as yet. But as I said it’s not 100%, it’s not 100% accurate, I’m just telling you what I think it might be.’ And whatever they do with that information is up to them.”

3. Interview with sonographer (over 5 years’ experience):

VL: “Have you had people get angry with you for not being able to see the sex of the baby?”

Sonographer: “Yep, yep. A lot of people it’s sort of an expectation. But in that situation I just say as diplomatically as I can, say to them, ‘Look this is a medical test, we’re here to find out any medical problems with your foetus and you know, the gender of your baby is probably the least of; the least important thing we look at in this scan... it’s much more important having a healthy baby.’

In each of these interviews, I had been trying to elicit information about the range of emotional responses that sonographers had experienced from patients during the anomaly scan, where people are often told that they will be able to learn the sex of the baby. What is significant is that in each case the sonographer responded to my questions about emotion by detailing their own personal strategies for mediating people’s emotional responses. In interview number one, the sonographer reasons that the desire to know the sex is about “what colour clothes to buy” and so when people become exasperated about the “need to know” in the face of uncertainty, she reminds them of the material, light-hearted nature of this “need to know” by invoking “the sale of white, green, and orange clothes.” In interview number two, the sonographer also invokes the material “permanent changes in the house” consequences of sex determination, but does so in order to mitigate the evident disappointment when “the sex wasn’t what they were expecting.” In interview number three the sonographer describes how she returns people to the “medical” nature of the test by telling them that the health of the baby is “much more important” than the sex. In these ways, sonographers respond to negative emotional reactions in the context of sex determination by reminding people of the fact that the sex of the baby (and also the health) is not determinate at this point in the pregnancy. In the process, they engage in strategies to neutralise overtly (negative) emotional responses of people in relation to sex determination.

Ambiguity and morality

Even as families creatively engage in such practices to control who can access this “pink and blue” knowledge, the practice of sex determination continues to be permeated by an element of uncertainty. The limitations of ultrasound technology’s ability to fully “see” the body of a developing baby makes sex determination somewhat of an art form which requires a measure of skill. This skill is further mediated by the difficulties in detecting male or female genitalia early on in pregnancy, when the baby is not in the “right” position (such as if its legs are crossed), or when there is insufficient fluid surrounding the genitalia (as is often the case later on in a pregnancy). As one obstetrician told me:

You’re never going to be 100%. I mean even at the anomaly scan we get them wrong, and there it’s probably about – I mean we tell people about 90% – but it’s probably more like 95% accurate. When once again it can be difficult if the baby just never opens its legs so you just can’t ever see. Or you just don’t look properly. Cause you can make boys girls and girls boys – you can say that cord’s male genitalia or you can say – if the baby’s got its legs together - you can think that its female when in fact the genitals are sitting below – so both. So I know I’ve done both, I know everybody does.

In short, the use of ultrasound for sex determination is by no means a perfect science. The conditions for reliable sex determination results, even during the optimum period of pregnancy (the “anomaly scan”) are dependent both on the skill of the sonographer and the position of the baby during the scan. Sonographers would convey the uncertainty of the sex determination results by following their pronouncements of the baby’s sex with a disclaimer that “It’s not 100%.” One sonographer would even add, “Just buy white,” and “Don’t go buying pink and blue just yet.” I often witnessed couples...
seeking reassurance about the sex of their baby during scans conducted late in pregnancy; requests which were met with “It’s a bit hard to see at this stage.”

**Conclusion**

If sex determination during ultrasound really is just a matter of “pink and blue”, how do we explain the need for these reminders? How should we understand the emotional pull and the potency of the “pink and blue” knowledge? In the ultrasound room, it seems that “pink and blue” serves instead to neutralise the emotional and supposed “irrational” urges that people demonstrate in the context of sex determination decisions and results. It could be said that the above strategies constitute a form of “everyday ethics.” Sonographers sense people’s discomfort in response to the results of sex determination, or lack of results and attempt to rein in the emotional outburst. The strategy employed in interview number three is indicative of the morality at play in the practice of sex determination: the medical nature of the test is “more important” than the patient’s desire to know the sex. Thus, through the invocation of various moral and ethical assumptions, sonographers rein in what they perceive to be inappropriate or undesirable emotional responses. At the same time, they reinforce the notion that the practice of sex determination is merely a matter of material colour-based desires, and that the ultrasound scan is primarily about finding “more important” medical problems.

The simplistic assumption of “pink and blue” also permeates the bioethics debates in Australia, which seem focused on the new reproductive technologies such as PGD. I argue that more attention should be paid to the ways in which advancements in the quality of ultrasound images have the potential to alter the ethical issues in relation to this technology. In this sense, sex determination is but one lens through which we can examine the pivotal role of sonographers in mediating the way in which people receive the results of their ultrasound exams during pregnancy. We see through the “meaning making” processes that sonographers translate the sonographic images in a manner that has the potential to enhance the emotional experience of routine ultrasound. However, when the emotional responses of patients are perceived to be inappropriate or irrational, sonographers can also engage in neutralising strategies which serve to reinforce the “pink and blue”, light-hearted component of sex determination. Through such strategies we see that “everyday ethics” has the capacity to shape moral language about sex determination, even when there are no formal ethical regulations in place.

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**References**


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