
WOMEN'S EXPERIENCES OF LATE PREGNANCY ULTRASOUND:
IMPLICATIONS FOR ANTENATAL CARE

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Implications for Antenatal Care

Student: Alison Dacey

I hereby declare that:

This dissertation is the result of my own work and includes nothing which is the outcome of work done in collaboration except where specifically indicated in the text and bibliography

My dissertation is not substantially the same as any that I have submitted for a degree or diploma or other qualification at any other University. I further state that no part of my dissertation has already been or is being concurrently submitted for any such degree, diploma or other qualification.

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ABSTRACT

Objective: This study addresses an identified gap in knowledge regarding the expectations and experiences of women undergoing third trimester ultrasound in the United Kingdom.

Design: This dissertation is a qualitative study. It is theoretically informed by grounded theory. Methodologically, it draws on data collected through semi-structured interviews (n=50) conducted 18 months – 4 years following participation in the Pregnancy Outcome Prediction study (POPs) Participants were identified from the POPs database and sampled according to three criteria regarding pregnancy outcomes.

Setting: Interviews were conducted in participant's homes in South East England.

Findings: The data revealed three core themes: ultrasound as a means of ascribing reality to the pregnancy; the importance of the visual aspect of ultrasound; and the reassuring effect of ultrasound. Ultrasound played a pivotal role in the confirmation of life and the reality of the child. The visual aspect of 'seeing' the unborn child provided a level of reassurance beyond other aspects of routine care and for this group of mothers was the significant and defining moment of psychological reassurance.

Conclusions: While the underlying themes were analogous there were differences between how women experienced late trimester ultrasound from earlier scans, the data revealed important findings pertaining to the role of ultrasound in preparing for birth and transition to parenthood. It raised questions relating to the environment of scanning, the experiences of research participation during pregnancy, and the implications of these scanning experiences for routine antenatal care.

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INTRODUCTION

Ultrasonography is the imaging technique that permits' the paradox of "seeing" with sound (Yoxen 1987)

1.1 The Subject

The ultrasound image of the fetus has become an accepted part of modern day culture, routine antenatal care and pregnancy. Over the last four decades it has developed into a sophisticated method of assessing the fetus and there are significant and familiar discourses across lay and professional groups pertaining to its use and influence in pregnancy, not just from a medical perspective but also from a social and cultural aspect.

It has been suggested that ultrasound is not simply a banal and routinised medical intervention but rather, is an ideology of pregnancy (Donovan, 2006). Patterns of echoes displayed as black and white images on a screen have become a means of confirming pregnancy. Furthermore, the ultrasound visualisation of the fetus in early pregnancy now over-shadows previous practices such as quickening¹ for the knowledge and realisation of the pregnancy as a reality for women (Dykes & Stjernqvist, 2001).

The increasing use of ultrasound technology has given us new insight into fetal and maternal physiology, fetal behaviour and maternal emotions (DiPietro, 2010). This technology offers women, their partners and obstetricians direct access to the previously private world of the fetus. However the use of ultrasound in obstetrics is juxtaposed between two different paradigms; the medical profession who look upon ultrasound as a screening and diagnostic tool, and the parents who, it is increasingly argued, seemingly construct scans as a purely social event.

In order to situate ultrasound within the context of maternity care, this chapter examines the historical roots of ultrasound; it describes the introduction of scanning

¹ The moment in pregnancy when the pregnant woman starts to feel or perceive fetal movements in the uterus

technology into obstetric practice and its impact on the provision of antenatal care today. Alongside this, relevant policy documents, current recommendations and protocols relating to the provision of third trimester ultrasound in the UK and Europe have been considered and compared. In conclusion it describes the design and protocol of the Pregnancy Outcome Prediction study (POPs) from which participants were identified and recruited.

1.2 Background

Situated in the positivist paradigm that 'seeing is believing', Western science places an emphasis on 'looking' to generate empirical evidence. The desire to look inside the human body was realised in the medical scientific dissection of corpses' from the 18th century onwards. At this time seeing became the fundamental way of generating medical knowledge cementing the medical gaze as the eye of authority in science (Draper, 2002).

The development of imaging technology throughout the twentieth century has rendered the human body increasingly transparent to the medical profession. Since the introduction of X-rays in 1896 more sophisticated techniques have been developed to allow non-invasive examinations of the human body, including MRI, CT² scanning and ultrasound. Ultrasound imaging involves bouncing sound waves above the audible range of human hearing at body structures or tissues, and detecting the echoes that bounce back. Based on the angle of the beam, and the time it takes for echoes to return a grey scale image of body structures is created. Using its thermal properties to treat arthritis, ultrasound was first utilised in the clinical setting as a therapeutic procedure (Woo, n.d). In the early 1950s its potential as a diagnostic tool was recognised.

1.2 1The Birth of Obstetric Ultrasound

As has been well documented, the obstetric ultrasound scanner originated from research undertaken in Glasgow in the 1950s by obstetrician, Professor Ian Donald (McNay & Fleming, 1999). Donald first introduced an ultrasound machine to his maternity ward in 1957 where it was used by a staff nurse to determine fetal presentation before ward rounds. This application inspired the measuring of the fetal skull to assess gestational age and its size in relation to the maternal pelvis. This first

² Types of scans which use x-ray or radio waves to produce images of the body

measurement of the fetal head was the bi-parietal diameter. In 1964 Donald was joined by obstetrician Stuart Campbell. Together they combined A-mode and B mode scanning which displayed a two-dimensional cross-section of the tissue being imaged to improve the accuracy of the head measurement. Further research by Donald and Campbell led to the development of other fetal measurements such as; the abdominal circumference, femur length and crown rump length which continue to be used to predict gestational age and assess fetal growth in current practice (McNay & Fleming, 1999).

The introduction of grey scale imaging provided a much more complex image which differentiated between different types of tissue. Advances in technology enabled the fetal image to be viewed on a monitor and the ability to record images on thermal paper was introduced (McNay & Fleming, 1999). When the fetal body began to appear in publications, obstetricians realised the potential significance of being able to examine the fetus (Mitchell, 2001). The introduction of real time scanning began in the 1970s and it was at this time that both clinical and commercial implications were fully understood (McNay & Fleming, 1999).

1.2.2 Implementation into Practice

Initially obstetricians resisted its application in practice, arguing that they did not need a machine, having spent years training their hands to 'see' (Tansy & Christie, 2000: 34). However, advances in this technology enabling visualisation of the fetus developing within its mother's womb were of great appeal to pregnant women. Manufacturers exploited this by offering women the opportunity to 'see their baby' as they demonstrated their equipment (Mitchell, 2001), ensuring 'buy in' from one of its biggest stakeholders, the women themselves. The popularity of ultrasound has grown exponentially with the technology and today it is viewed as a rite of passage in to the world of pregnancy.

In 1969 Campbell recommended that all pregnancies should be dated by ultrasound. Consequently ultrasound now routinely replaces calculations of the women's menstrual cycle to date pregnancies and has become adopted as standard practice. Within a few years of its introduction clinicians had begun to interpret data from scans to identify fetal abnormalities and prenatal diagnosis became possible. The

speciality of fetal medicine was first recognised around 1973 as ultrasound became more widely used in routine care. Although this was pivotal in identifying surgically correctable defects, many conditions were untreatable and the main option open to women was termination of the pregnancy.

Technology does not always provide definitive answers regarding the outcome of a pregnancy and the impact it may have on the infants' future. Roberts (2013) argues that while we may be offering women more control and reproductive choice this is not without consequences. However, it cannot be denied that this commonly used technique has had a considerable effect on the medicalisation of pregnancy and the construction of the fetus as a patient separate from its mother. Mitchell describes how this has changed the public perception of the fetus by arguing that ultrasound has become the means of creating a new reality: "the fetus as a complex, acting, sentient, diagnosable and treatable individual" (Mitchell, 2001; cited in Roberts, 2013:21). Arguably, as a direct consequence of ultrasound, obstetric practice has now become a two patient model in which the fetus is treated in its own right – separate and distinct from the mother (Sandelowski, 1994).

1.3 Current Practice, Guidelines and Policy in the UK

Ultrasound imaging in pregnancy has become routine in the western world and in most countries women undergo a minimum of two scans in pregnancy. In the last two decades the routine use of ultrasound as a prenatal diagnostic tool has undergone a transition from a risk based, to a population based application. UK Department of Health statistics demonstrate an increase in the number of scans performed each year. Department of Health (2013) statistics reveal that nearly three million obstetric ultrasound scans were performed in 2012/2013 in the National Health Service. This compares with two and a half million in 2009/2010 (Roberts, 2013).

Clinical application is not the only explanation for a rise in the number of scans (Roberts, 2013). Janelle Taylors' (2008) work analysing the socio-cultural context of ultrasound technology and imagery suggests that routine use of ultrasound is partly due to the perceived psychological benefits' of increased awareness of the fetus and its role in changing maternal behaviours and bonding. Despite the 'taken for granted' cultural affinity with scans during pregnancy, debates about safety have been raised

(Beech, 2004). The British Medical Ultrasound Society 2009 guidelines advise that there is no evidence of harmful effects from scanning in pregnancy. A systematic review undertaken by Torloni *et al* (2009) concluded that there is no robust scientific evidence to suggest that ultrasound is unsafe in pregnancy. In order to provide further empirical evidence, long-term clinical trials would be necessary. Its widespread use and popularity mean that any clinical trials which involved withholding scans would be deemed ethically unacceptable by health professionals and would undoubtedly cause an outcry amongst women.

National Institute of Clinical Excellence (NICE) 2008 guidelines recommends that all women in the United Kingdom are offered two scans. The first is performed between 10-13 weeks to confirm fetal viability and check for multiple pregnancies. It also determines gestational age, which increases performance of screening tests for Down's Syndrome and reduces the need for induction for post term pregnancies. The second scan is offered at 20 weeks. This scan is to screen for fetal abnormalities and localisation of the placenta. Ultrasound is also used in early pregnancy to confirm miscarriage and diagnose ectopic pregnancies.

The timing and frequency of ultrasound in late pregnancy depends on geographical location. Third trimester ³ultrasound is not routinely offered in the United Kingdom. This contrasts with European countries such as France and Italy where at least one more scan is routinely offered in late pregnancy. The main reason for this is due to obstetric care being undertaken by obstetricians who routinely scan women on each visit. This contrasts with practice in the UK where scans are primarily provided by specially trained ultrasound practitioners known as sonographers.

The benefits of routine ultrasound in the third trimester (detection of conditions such as intra-uterine growth restriction, assessment of placental function and fetal presentation which may not be detected by clinical examination and could potentially improve perinatal outcomes) are frequently debated with overall evidence demonstrating that late pregnancy ultrasound does not impact on perinatal mortality (Bricker, Neilson, & Dowswell, 2008). This meta-analysis evaluated the use of ultrasound in late pregnancy (after 24 weeks). It reviewed 8 controlled trials with a total of 27,024 women randomized to a screening or a no screening control group

³ time period extending from the 28th week of gestation until delivery

and concluded that it is not clear which aspects of late pregnancy ultrasound may be valuable.

In line with Royal College of Obstetricians & Gynaecologist (RCOG) 2000 recommendations, ultrasound in late pregnancy in the UK is only offered selectively for mothers who are at high risk of complications, when there is a suspicion of fetal growth abnormalities and to confirm fetal presentation. The overall purpose of these examinations is to reduce perinatal mortality and morbidity. Women who do not have any risk factors are not offered routine scans in the third trimester. NICE guidelines on antenatal care explicitly state that routine Doppler and growth studies should not be performed on an unselected population (RCOG, 2008.) The basis for their position is the result of the review by Bricker, Neilson, & Dowswell, (2008) which identified no benefit.

With the aim of identifying new markers for adverse pregnancy outcomes and to evaluate the performance of biochemistry and serial ultrasonography in providing prediction of risk, a large observational study was undertaken in the South East of England. The Pregnancy Outcome Prediction study (POPs) was the first of its kind in that it provided a significant cohort of unselected women undergoing ultrasound in the third trimester. It offered a unique opportunity to explore the personal experiences of women undergoing ultrasound in late pregnancy both in the context of its clinical application and in the setting of a research environment.

1.4 Pregnancy Outcome Prediction Study

The POP study was a single centre five year prospective cohort study of primiparous⁴ women. The study recruited 4512 women in their first pregnancy. Women were recruited at the time of their first ultrasound scan. Participation involved serial phlebotomy⁵ and ultrasound scans at 10–14 weeks, 20 weeks, 28 weeks and 36 weeks gestation. At these scans, fetal biometry, amniotic fluid index, uterine and umbilical artery Doppler flow, and assessment of placental maturity were recorded. These scans were unreported except for the following criteria

- previously unrecognised major congenital abnormality,

⁴ A woman who is pregnant for the first time

⁵ Taking of blood samples

- previously unrecognised placenta praevia
- profound oligohydramnios (amniotic fluid index less than 5)
- Breech presentation at 36 weeks.

In addition, maternal demographic details were obtained; maternal and paternal height was measured and maternal weight was serially measured during the pregnancy; maternal, paternal and offspring DNA was collected; and, samples of placenta and membranes were collected at birth (Pasupathy et al 2008).

The initial as yet unpublished results of this study have concluded that compared with selective ultrasonography, serial ultrasound fetal biometry at 28 and 36 weeks increased prenatal detection of Small for Gestational Age infants⁶ by two to three-fold (Sovio, Smith & Dacey, 2014). Data on its effect on clinical outcomes is currently being evaluated.

1.5 Aims

This qualitative study addresses the gap in knowledge regarding the expectations and experiences of women undergoing third trimester ultrasound in the United Kingdom. Using in-depth interviews, the research explores the range of experiences and lay health beliefs that surround ultrasound in pregnancy, particularly in the third trimester. It explores the personal and clinical outcomes experienced by participants as a consequence of undergoing a third trimester scan, and how this impacts on their experiences and retrospective narratives of pregnancy and birth.

Chapter 2 presents a comprehensive review of the relevant literature. Chapter 3 describes the methodology. It provides a justification for the method and the advantages and disadvantages of this approach. Chapter 4 presents the findings of the study. Using examples of narratives from the interviews it presents women's views and experience of ultrasound in pregnancy, and examines participants understanding and experiences of taking part in research. Chapter 5 discusses the findings of the study.

⁶ A fetal weight that is below the 10th percentile for gestational age as determined through an ultrasound

1.6 Scope

The introduction of serial ultrasound scans for all pregnant women in the United Kingdom has far reaching cost implications for a service which is already struggling to meet demands. If we are to consider changing our approach and adopting the practice of routinely offering women ultrasound scans in the third trimester we need to provide evidence that considers benefits and risks from clinical, social and psychological aspects, and under what conditions its use may be of value.

2 Literature Review

This chapter presents the current available literature pertaining to women's experiences of ultrasound in pregnancy. Furthermore, it explores the position of feminist scholars in the discourse surrounding scans and examines how ultrasound has influenced the construction of the fetus as a child.

2.1 Systematic Reviews

In the last decade two significant systematic reviews have been conducted looking at the literature on women's experiences of ultrasound in pregnancy. The first review undertaken by Garcia, *et al* (2002) evaluated 74 primary studies from eighteen countries. It consisted of quantitative and qualitative studies examining women's views of pregnancy ultrasound. The authors concluded that experiences of ultrasound in pregnancy are influenced by a range of factors including women's understanding of the reason for the scan, how they make sense of the scan and how they interpret the results. Twenty five of the studies provided information on what women value about ultrasound. These results showed that 'seeing the baby', confirmation of the pregnancy and reassurance were the key aspects of ultrasound for the participants. The most significant finding of the review was how attractive ultrasound is to women and their partners.

As introduced in Chapter 1, the second significant review was undertaken by Bricker, Neilson, & Dowswell (2008). Interestingly their review did not include any qualitative research, and their findings pointed to a lack of data regarding the psychological effects of routine ultrasound in late pregnancy. They suggested that future studies should address this gap alongside implications for mode of delivery and childhood outcomes.

2.2 Knowledge and Beliefs

Ultrasound during pregnancy is accepted as the norm in the Western World. So much so that its use is rarely challenged and is regarded by women as one of the most important aspects of antenatal care. The uncertain nature of pregnancy produces anxiety for expectant mothers particularly regarding fetal health (Homer 2002) and ultrasound scans provide access to information regarding the health and

physical development of the fetus which would otherwise be unattainable. However this can be a double edged sword as the results of ultrasound scans can often raise a range of ethical and social dilemmas for pregnant women when they have to make decision regarding the future of the pregnancy (Williams 2005).

As previously discussed the routine use of ultrasound now enables doctors to identify conditions in utero and treat the fetus as a separate patient. However many conditions which are detected are often untreatable and result in termination of pregnancy. In most of these cases fetal anomalies are detected in low risk women unaware that they were at risk. This has a significant impact on women's experience of pregnancy as the burden is placed upon them to make a decision on whether to continue with the pregnancy or opt for termination. The implications of this on the mothers psychological wellbeing has led health care professionals to query the extent to which women are making informed decisions before undergoing ultrasound screening, and to question their understanding of its diagnostic purpose.

There is an extensive body of literature examining women's understanding and experiences of ultrasound in the first and second trimester (Kohut, Dewey & Love, 2002; Lalor & Devane, 2007). The focus of this literature relates to screening for Down's Syndrome and fetal abnormalities. It evaluates the issue of informed consent and understanding in relation to ultrasound screening. Literature suggests that women have a general assumption that scans are compulsory and very few women are aware that they can opt out of having the examination (Whynes, 2002). It also suggests that many women presenting for ultrasound appear uninformed as to the purpose and the safety of the investigation (Thorpe *et al*, 1993). A number of studies have highlighted that women have limited knowledge of the purpose, benefits, limitations, and potential consequences of antenatal ultrasound, and as a result lack information to make an informed choice on whether to undergo screening (Garcia *et al* 2002; Marteau, 1995; Marteau *et al*, 1992).

Although studies are consistent in reporting that women understand that scans are a way to check the baby is "healthy" they have little perception of the conditions it may, or may not, detect. For example, one study found that only 18% of women knew that ultrasound would not pick up cases of cerebral palsy (Smith, Titmarsh & Overton, 2004). A Canadian study of 117 women used a questionnaire to evaluate women's

understanding of ultrasound in low-risk patients attending a radiology clinic for their second-trimester anomaly scan. Of these, 55% stated that they had received no information regarding prenatal ultrasound testing, and 46% did not view ultrasound as a screening test for anomalies (Kohut, 2002).

Women often perceive ultrasound as an opportunity to 'see their baby' and 'find out' the sex. It is viewed as non-invasive, without risk and as a social occasion (Stephens, Montefalcon & Lane, 2000). This has led to professional concern that the appeal of 'seeing' the baby contributes to the fact that parents are undergoing scans without considering the implications (Garcia *et al*, 2002).

2.3 Seeing is Knowing

Anecdotal evidence on women's dialogues surrounding pregnancy reveals that they are often centred on 'seeing' the ultrasound image as a way of knowing their child. As an example, when a woman announces her pregnancy the first question is inevitably 'have you had your scan yet?' or the scan picture is used as a means of telling the news of the pregnancy. It cannot be disputed that the routine use of ultrasound has radically changed the way in which women experience pregnancy compared to previous generations.

Sandelowski (1994) suggests that the epistemology of pregnancy has been altered with the emphasis now on 'seeing' as the primary mode of knowing the fetus. Prior to its use, women relied on their own physical signs as the method of fetal surveillance during pregnancy. Feminist scholars have highlighted how ultrasound scans compete with women's knowledge of their own bodies (Roberts, 2013). As Roberts argues, it is somewhat ironic that information from a technology which has been advanced through women's experience of pregnancy has now replaced that unique experience.

2.4 The Embodied Experience

There is a wealth of feminist discourse debating the influence that ultrasound has placed on the way women now experience pregnancy. Further literature supports Sandelowski's view that ultrasound technology has superseded women's own subjective knowledge of their bodies as the principal mode of fetal enquiry (Taylor, 2000; Zechmeister, 2001; Petchesky, 1987). They suggest that ultrasound is a way of bypassing pregnant women as a source of information, encouraging women to

substitute heavily interpreted images for their own physical experiences of pregnancy (Taylor, 2000).

These accounts position the routine use of ultrasound as a tactical move by the medical profession to control reproduction. Zechmeister (2001) supports this view by proposing that the mother is now relegated to the role of an object of “medical surveillance” conflicting with her role as the primary resource of information regarding the pregnancy. She asserts that by focusing solely on the fetus during the scan the woman is positioned in the role of spectator and passive recipient.

Petchesky (1987) states that “by providing visual access to an animated fetus while still in utero, fetal ultrasonography has transformed pregnancy into a media spectacle” (1987:58). Despite this, it is the visual allure of ultrasound which situates it as an essential part of pregnancy for women. A number of studies have documented the impact that visualisation of the fetus has for women, and its role in affirming the reality of pregnancy and impending parenthood (Dykes & Sternqvist, 2001; Ekelin, Crang-Svalenius & Dykes, 2004; Molander, Alehagen & Bertero 2010).

Literature suggests that ultrasound also has a place in reducing anxiety, and promotes earlier attachment and bonding (Harpel, 2008; Molander, et al 2008). Harpel’s (2008) qualitative inquiry found that while women reported an increase in anxiety prior to ultrasound examinations, this was relieved by access to visual images of the fetus and positive feedback from the sonographer. Further studies support this, reporting a reduction in anxiety, stimulation of a parental bond with the fetus and contribution to positive health behaviours (Whynes, 2002). Two dimensional scans in early pregnancy have also been shown to have a positive impact on maternal feelings towards the fetus (Dykes, & Stjernqvist, 2001; Villeneuve, et al 1988).

The shift in the way pregnancy is experienced is not unique to women. The examination offers an opportunity for the father to be an active participant and helps them to understand the reality of the pregnancy. Ultrasound has opened up a previously hidden world to the father and enabled him to experience pregnancy like never before. Ekelin, Crang-Svalenius & Dykes (2004) found that men’s and women’s experiences during scans were similar although they often expressed their feelings in different ways. This is supported by Draper’s study (2002) which looked at

men's experiences of the transition to parenthood. She found that ultrasound represented an important part of this transition and that seeing the baby on the screen was more significant than other physical signs of pregnancy such as observing fetal movement for men. This 'window' into the women's body provided them with the strongest evidence that the baby existed and was the most significant memory of the pregnancy.

2.5 Nurturing the Unborn

The archetypal image of the fetus has become ingrained in today's society and is accepted as a factual representation of the unborn child. The clarity of ultrasound images which present the fetus so that it can be imagined as a future child promotes an early obligation to protect and nurture that being. Ultrasound scans are in many ways seen as an extension of maternal responsibility "expanded from the care and nurture of children to careful compliance with the medical monitoring of pregnancy" (Williams, 2005: 235). Although women may not attend routine clinic appointments, (low risk women are offered appointments with a midwife or obstetrician at 16, 24, 28 & 32 weeks, then every two weeks until 40 weeks) it is rare that they default from their scan appointments.

Anecdotal evidence and web forums suggest that women who do refuse scans in pregnancy report feeling frowned upon by health professionals. The social pressure that denotes ultrasound as necessary in pregnancy makes it difficult for them to refuse the examination unless they are prepared to 'accept the consequences'. Pregnant women who refuse ultrasound examination are often portrayed as 'bad mothers' who are not prepared to reduce risks for their fetus (Mitchell, 2001). Scans may also be used as a way of creating guilt through monitoring the mother's shortcoming and failures (Mitchell & Georges, 1997); for example if they smoke or are obese they will be offered extra scans to 'monitor the pregnancy' with the implication that the woman is not capable of this herself. In essence women take primary responsibility for creating the perfect child and ultrasound is positioned as a way of them achieving this.

2.6 Imagining the Child

The construction of the fetus as a child who needs to be looked after is partly due to the way ultrasound provides a source of information which enables Western society

to construct personhood. An important factor in the ability of parents to visualise the child is the interplay between them and the sonographer. Petchesky, (1987) suggests that parents see in fetal images 'what they are told they ought to see'. As observers of the scan they rely on the sonographers' description of the image to enable them to visualise the fetus.

Literature describes how sonographers 'show the baby'; deliberately selecting parts which are recognisable and reassuring such as the heart beating and fingers and toes. It suggests that these interactions are part of how the ultrasound image becomes meaningful in the construct of the 'baby' (Mitchell & Georges, 1997). Sandelowski *et al*, (1994) suggest that ultrasound presents an opportunity for women to know their unborn child in ways unknown to previous generations. Anecdotally during scans women are often heard to describe their child in such terms as 'naughty', 'busy' or 'lazy'. The use of ultrasound enhances a women's ability to attribute characteristics to her baby and perpetuates this notion that the fetus is an independent and developing person.

2.7 The Fetus as a Family Member

The introduction of thermal images which are taken away from the scan room has further integrated the fetus into the family. Parents now take away visual evidence that plays a significant role in introducing the 'baby', and presents a strategy for family building. The traditional first picture for the family album historically taken in hospital has been replaced by the first scan picture. Petchesky (1987) talks about the responsibility falling to the mother to maintain the family album and present fetal images establishing the future child in family ancestry.

Many parents attending scans are keen to discover the sex of their baby. This plays a significant role in their overall experience and expectation of ultrasound. It also plays a part in promoting the concept of the fetus as a person. Once the sex of the fetus is known it can be named and parents begin preparation for its arrival. This stereotypically involves 'decorating the nursery' and 'shopping'. Taylor, (2000, 401) identifies this as part of the parental role. She suggests that buying things for the fetus is akin to recognising it as an individual consumer, a baby, a person.

Furthermore the technology of 3D ultrasound has provided parents with real time three dimensional images of their baby and has taken 'seeing' the fetus to a new

level. It is now possible for parents to see evidence of their baby smiling and yawning providing further proof of its human qualities. 'Fetal photography scans' are increasingly undertaken privately, in commercial settings, and are heavily criticised by the medical profession as unethical. There is concern that these scans present psychosocial risks to women. Chervenak & McCullough (2005) suggests that unlike baby pictures in photography studios which have no medical aspect, baby pictures in so called 'boutique fetal imaging' carry a risk of providing misleading information which may influence maternal wellbeing.

The psychological impact of 3D scans (often undertaken in the third trimester) has not yet been fully evaluated in relation to women's experience of pregnancy. However, some work has been undertaken on the effects on 'bonding'. Bonding is defined as the relationship which a mother forms with her child. Historically this was thought to occur at the time of birth however some suggest that ultrasound has expedited this process. Roberts (2013) suggests that this again places the medical experts as gatekeepers to the experience, yet this view is complicated by the fact that many women are willing to pay to experience so called 'bonding scans' outside the clinical setting.

In summary, the available literature provides evidence of the gap in women's knowledge regarding ultrasound; it supports the importance of ultrasound for pregnant women as a method of fetal surveillance in both a medical and social context. It validates its visual power in the acceptance of pregnancy, reassurance and transition to parenthood. This review revealed that there is limited evidence demonstrating the implications, benefits' and experiences of women undergoing third trimester ultrasound scans in the clinical context. The data which exists is largely based on the practice of 3D scanning in the social context. With the increasing use of ultrasound in the third trimester, particularly in relation to social scanning, an evaluation of its possible implications on maternal health and wellbeing needs to be undertaken. This research is, therefore, a unique opportunity to explore this apparent dearth of evidence.

3 Methodology

This qualitative study is an exploration of women's experiences of ultrasound scans during pregnancy. The study uses semi-structured face to face in-depth interviews undertaken with a selected population of women who had previously participated in the POP study. A grounded theory approach was used to analyse the data. Ethical approval for the study was granted by the Cambridge South Local Research Ethics Committee (Ref 13/EE/0327)

3.1 Sampling

Purposive sampling was used to select potential participants from the POP study. This approach was chosen because purposive sampling is designed to enhance understandings of selected individuals or group experiences (Devers & Frankel, 2000). Sampling was continued until data saturation was achieved. This occurs when no new themes are emerging from data collection methods.

Eligible participants were identified via the POP study database. The inclusion criteria were as follows:

- Previous participation in the Pregnancy Outcome Prediction Study.
- Ability to provide informed consent at time of interview.
- Proficient in comprehension of English to a level that enabled participation in the interview process.
- Adults over 18 years of age.

In order to obtain data from women who experienced differing clinical outcomes as a result of undergoing extra ultrasound scans, three groups of women were identified from within the POP study cohort. The rationale for the selection of the three groups was to identify if there were any differences in the way women recalled their experiences of third trimester ultrasound in relation to the outcome of the pregnancy, and how this may have influenced their subsequent birthing experience and adaptation to parenthood. It was anticipated that 15 women would be recruited in each group. The groups were defined as follows:

1. Unreported scan with a healthy infant delivered at term⁷.

⁷ After 37 weeks of pregnancy

2. Unreported scan with a poor outcome: for example a small baby <3rd percentile at term.

3. Scan reported due to one of the criteria outlined in the POPS protocol (1.4).

The distribution of demographic characteristics between each group are outlined below

Variable	Group 1 n=16	Group 2 n=18	Group 3 n=16
Age			
20-30	0	2	2
30-40	15	14	10
40 plus	1	2	4
Marital status			
Married	14	14	14
Co-habiting	1	3	0
Single	1	1	2
Parity			
1	8	15	15
2	8	3	1
Highest qualification			
GCSE	2	0	0
A level	3	4	2
Degree	5	7	6
Post Graduate	5	6	4
PhD	1	1	4

3.2 Recruitment

A letter of invitation along with a patient information sheet and a consent form were sent to women in an information pack (Appendix 1). Information packs were sent in batches of forty to each group. A reply slip and stamp addressed envelope were provided with the pack for women to return if they were interested in taking part in the study. On receiving a response the researcher made telephone contact with the women to confirm their ongoing willingness to take part and arrange an interview at a time suitable for them. No further invitations or reminders were sent to women who did not respond. Letters were sent to two hundred and forty women, this was

approximately eighty from each of the groups identified above. Sixty women replied indicating they were willing to participate giving a response rate of 25%. Due to time constraints fifty women were selected for interview. A letter was sent to the remaining ten women thanking them for volunteering.

3.3 Data collection

3.3.1 Setting

The interviews were conducted across three counties in the South East of England. Women were invited to take part in an interview at their home or a location of their choice. Giving participants the choice about where they are interviewed promotes empowerment in their interaction with the researcher (Green and Thorogood, 2009). Most of the participants chose to be interviewed at home; three of them chose to be interviewed in the researcher's office as they worked at the hospital. Choosing the appropriate setting is essential, as this can affect the quality of the response the researcher gets from the interview (Balls, 2009). The participant needs to feel on an equal footing to the researcher as the epistemological assumption of the qualitative paradigm is based on reducing the distance between the researcher and the informant (Creswell, 1994).

It is suggested that the interview site establishes multiple scales of spatial relations and meaning, which create the power and positionality of participants in relation to the people, places and interactions discussed in the interview (Elwood & Martin, 2000). The participants had all been patients during the period of time discussed in the interviews. At that time the balance of power was with the health care professional. By interviewing at home, participants were the 'experts' in their experience. Conducting the interviews in a private space that the participant feels is 'theirs' also helps to ensure confidentiality and foster a relaxed atmosphere to develop rapport (Green and Thorogood, 2009).

3.3.2 Interviews

Data were collected through a semi-structured interview. Interviews were conducted by the researcher over a period of three months. Each interview lasted between 30-60 minutes. The interviews were audio recorded with the participant's permission using a Sony digital recorder. They were professionally transcribed verbatim, anonymised using numerical codes with the participant number followed by the

group number (for example: participant one in group one is coded 101). They were read by the researcher and supervisor

The nature of semi-structured interviews allows the researcher to make sure that the main topics for the interview are covered whilst allowing a degree of freedom and flexibility to adapt to interviewee's responses (Turner, 2010). It offers the interviewer the opportunity to explore issues and allows the interviewee the chance to express their opinions, concerns and feelings. This fits well with the emergent theory approach of grounded theory.

The disadvantages of this approach are that good interviewing skills are required and preparation of questions must be carefully planned so as not to make the questions prescriptive or leading (Polit & Beck, 2012). With this in mind, an interview schedule was drawn up reflecting on previous literature and studies of this nature. The interview schedule (appendix 2) aimed to encompass the whole pregnancy experience for the women with a particular focus on their experience of ultrasound during the pregnancy. In line with the grounded theory approach the interview questions were modified throughout the interview process to incorporate emergent themes (Charmaz, 2006).

Prior to the interview consent was taken and it was made explicit that the interview could be paused or terminated at any point. The first few minutes of the interview consisted of questions about the participant and were designed to build rapport (Creswell, 2007). This led onto an initial open question which was used in all interviews: *'Thinking back can you describe to me how you first found out you were pregnant and your feelings at that time?'* This question gave the women opportunity to reflect back to the beginning of the pregnancy and encourage a narrative of events in their own words. It also helped to create a timeline to discuss the pregnancy: from the discovery of being pregnant up to the time of birth and beyond. At the end of each interview the researcher discussed how the women had felt about the interview. If it had raised any issues or concerns surrounding their pregnancy, further contact numbers were given for the Birth Afterthoughts debriefing service at The Rosie Hospital. Cambridge.

The researcher kept a reflective diary which was written immediately following each interview. This was used to record contextual data which was not collected during

the interview. It was also used as a tool to explore personal responses to the interview and help identify any researcher bias. The researcher's background as a midwife sonographer caused a potential conflict between the two roles. Reflection on this helped the researcher to explore her own feelings and gain an understanding of being impartial. Alongside this, the diagrammatic practice of mind mapping helped to identify emerging themes and develop an analytical framework.

3.4 Underpinning Theory

Grounded theory is inductive with the aim to generate or discover new theories that emerge from empirical data (Green & Thorogood, 2011). It is a model for exploring social relationships and the behaviour of groups where there has been little exploration of the factors that affect social processes (Crooks, 2001). This method was chosen as it allowed us insight into women's understanding of ultrasound in pregnancy, and facilitated an exploration of the social interactions by which sense is made of individual experiences.

Grounded theory was pioneered by the sociologists Barney Glaser and Anselm Strauss during their study on the process of death and dying in hospitals (Glaser and Strauss, 1965). As they constructed their analyses of dying, they developed a systematic approach to qualitative data analysis which they published as 'The Discovery of Grounded Theory', (Glaser and Strauss, 1967). They advocated developing theories from research grounded in data as opposed to generating hypothesis from existing theories. This provided a strong argument that gave credibility to qualitative research as a methodological approach in its own right (Charmaz, 2006).

Grounded theory weds two somewhat opposing sociological traditions: positivism and symbolic interaction. Glaser brought a logical and systematic approach to grounded theory reflecting his rigorous quantitative training at Columbia University. This is evident in the epistemological assumptions, systematic coding methods and emphasis on emergent theories (Charmaz, 2006). In contrast, Strauss brought a pragmatist philosophical tradition from the Chicago School of Sociology. This assumes a theoretical perspective that society, reality and self are constructed through interaction and are inherently reliant on language and communication (Charmaz, 2006). Drawing on symbolic interaction, "grounded theory assumes that

people order and make sense of their world, even when it appears disordered” (Stanley, 2006: 64). By studying the processes that happen in social situations, researchers using grounded theory develop theories that explain the actions taking place (Stanley, 2006).

Since their original work, the authors have taken grounded theory in differing directions. Strauss in collaboration with Corbin (1990) moved the method towards becoming more reflexive and respondent-led as a means of conducting the analytical process. Glaser criticized this for going against traditional grounded theory by forcing data and analysis into preconceived categories (Glaser, 1992). He continued to define grounded theory as a method which relied on observation and analysis of basic social process and strongly opposed strategies such as undertaking a literature review prior to data collection (Charmaz, 2006). The approach favored by Strauss and Corbin was used as a methodology for this study and a literature review was undertaken concurrently with data collection. As an example, it became apparent in the first few interviews that the visual aspect of ultrasound was a major factor in its appeal to pregnant women. This prompted the researcher to explore the literature focusing on the social implications of ultrasound as opposed to the diagnostic perspective.

Grounded theory is based around an iterative process of collecting data, analyzing it, and developing a provisional set of codes which then prompts further sampling and analysis. The other key principle of grounded theory is constant comparison whereby interpretation of data moves forward through constantly comparing data, codes and categories with each other. This analysis of data alongside emerging themes leads to theoretical sampling. Theoretical sampling involves constructing tentative ideas leading to more focused questions to interrogate these ideas further (Charmaz, 2006). This continues until a point of saturation is reached when no new constructs are emerging. This makes it both an inductive and deductive process producing ‘rich’ data (Green & Thorogood, 2011).

3.5 Analysis

In line with the grounded theory approach data analysis began as soon as data collection began (Charmaz, 2006). Following the initial interviews, the researcher examined the narratives. This led to a change in some of the questions and a

chance to test new ideas as they were emerging. The qualitative software programme NVivo 10 (QSR International) was used to manage the textual data, keep memos and record an audit trail. The first step in analysis is coding of the early interviews. Charmaz (2006) states “coding means categorizing segments of data with a short name that simultaneously summarizes and accounts for each piece of data”. Initial open coding began with the researcher who undertook the interviews reading the transcriptions line-by-line until preliminary codes for exploration had been identified. These were then discussed with the researcher’s supervisor. The purpose of open coding is to ‘open up’ the data. The intense nature of line by line coding is to generate as many codes as possible (Green & Thorogood, 2011). Some of these codes may be ‘in vivo’, in this sense participants’ special terms are used and adhered to. This maintains the participants’ meanings of their views in the coding (Charmaz, 2006) and prioritises their accounts and explanations over imposed interpretations.

The second stage of the process is focused coding, where the most frequent and/or significant initial codes are selected to analyze subsequent interview texts. This leads to theoretical coding where the researcher looks for possible relationships between the categories developed in focused coding (Charmaz, 2006). To be consistent with a grounded theory approach memos are used to capture ideas, make comparisons about the data and articulate emerging theories (Charmaz, 2006). The recording of ideas as they happen prevents important thoughts being forgotten and therefore lost (Stanley, 2006).

Through the analysis, three well defined themes were identified: ultrasound as the means of ascribing reality to the pregnancy, the visual significance of ultrasound and the reassuring effect of ultrasound. While the focus of the research question was to examine women’s experience of ultrasound in the third trimester, it is acknowledged that our views and experiences are often heavily influenced by previous experiences. During the interviews it became apparent that it was impossible to exclude the scans in the first and second trimesters from the analysis as the common themes outlined above, were identified in all trimesters. With this in mind the results will present the overall fundamental meaning of ultrasound for women in pregnancy but are presented according to experiences of scanning in the first, second and third trimester. The following chapter will discuss these themes accordingly, reflecting

back on what is already known on the subject and its relationship to the findings. It also presents an analysis of the significance of the context of this research: that is to say, that late trimester scanning occurred due to participation in POPs. Thus, the experience of being a research participant is an important consideration for how these women experience late trimester ultrasound.

4. Results

4.1 First Trimester

4.1.1 Keeping it secret

Miscarriage is a common complication in the first twelve weeks of pregnancy. The data suggest that reaching the twelve week stage represented a significant landmark for women in relation to the success, or failure of the pregnancy. This coincided with the first ultrasound scan usually performed around this time and may account for its position as the most important scan for many of the women interviewed. The majority of women did not announce the pregnancy until after this scan. The main reason for this was to check that the pregnancy was viable and to confirm that 'everything was ok' before sharing the news with others:

701 We liked to keep the pregnancy a secret until we've had the 12 week scan to check that everything's OK.

1401 Because I just wanted to make sure it was all ok. Because I didn't really want ...I don't think I wanted like the sympathy or, the apologetic looks people think oh dear you know, she lost her baby, or whatever I just wanted to make sure it was all ok.

The theme of miscarriage and viability also featured for women who did share the news prior to the scan. They explained their reasons for disclosure as the need to secure a select group of family or close friends as a support network if there were problems with the pregnancy:

602 We knew that within the first 12 weeks it's a higher risk of miscarriage so we didn't want to share our news until we had our first scan. And...but we wanted to be able to share it with some people and we also thought that even if something did go wrong we did have a miscarriage, we didn't want to go through telling our immediate family and then having to get their support, we just wanted them to already know so that if anything bad happened, you know it was one step closer to being supportive, kind of thing.

4.1.2 Ultrasound as confirmation of pregnancy

In the last two decades feminist work alludes to the fact that women have developed a reliance on technology in favour of their own embodied knowledge of pregnancy (Roberts 2013; Zechmeister, 2001; Petchesky, 1987) The findings of this study would support this stance. All of the participants had performed positive pregnancy tests early in the pregnancy and many described having pregnancy symptoms such as nausea, vomiting and extreme tiredness. Despite this, there was a reluctance to 'believe' that they were pregnant until the first scan. One major concern was attending for the scan and finding nothing there. This scan was viewed as the official 'confirmation' of pregnancy:

501 I was amazed, I went to see the doctor and said, 'I'm pregnant,' and nobody checked. [Laughs] I know that sounds bizarre now looking back on it but I was expecting some other kind of test, so really the 12 week scan was kind of the first reassurance that I was really really pregnant apart from a little stick that told me.

The scan confirmed that the pregnancy existed and dispelled feelings of disbelief. The reluctance to believe in the pregnancy until after the first scan was a consistent theme throughout most of the interviews. Though some of the participants talked about being convinced they were pregnant, they still felt that the scan was necessary to confirm the existence of the fetus:

1501 Um, I think we fully believed the sticks, you know, the pregnancy tests and things like that so we did know, but I suppose it's ... it was quite a different thing to knowing I was pregnant and not having any, um, sort of ... I didn't have morning sickness or anything like that so there weren't any sort of outward signs, obviously you don't start putting on weight immediately, so there weren't any outward signs, so it was nice ... I suppose in the back of my mind you go in for your first scan and I thought, I really hope that they do find a baby in there and I don't come across as a slightly mental person.

These examples demonstrate that even with physical symptoms, 'instinct' was superseded by a monochrome image on the ultrasound monitor. Visual knowledge was accepted as the primary way of knowing that the fetus existed.

4.1.3 The Reality of 'Being Pregnant'

The first ultrasound examination was a significant event for women because it provided concrete evidence that the fetus existed. Literature describes how powerful the effect of ultrasound is in increasing the women's realization of the pregnancy and the potential it has to change its meaning for them (Dykes & Stjernqvist, 2001; Molander, 2010). The ability to see the fetus moving inside them, so called 'techno quickening', and observe the heartbeat was important in enhancing the realisation of the baby. They described how visual confirmation led to the knowledge that the fetus was alive and healthy and caused strong emotional feelings:

103 Um ... oh I was just amazed, I just couldn't believe this little person was growing inside me. I just, I just ... I was just ... amazed, just in awe, I mean just ... completely

1301 it's there, the baby's there!' So yeah, it was lovely, I'll never forget that feeling actually, it was lovely. that first ... scan, Oh it was lovely, I think that's when I fell in love with him,

1502 seeing the image and seeing the heartbeat and ... eventually he started jumping, that was me done, that was it, I was pregnant.

This in turn led to an increased recognition that they were actually having a baby and the responsibilities that lay ahead. Women described how until this point they had just focused on 'being pregnant' and not started to consider the reality of having a baby:

302 oh my God, I'm going to have a baby, and I've got to look after this other life, you know, all of that is, is quite heady stuff. Um, and yeah, seeing, seeing the baby on a screen certainly helps bring that, that home to you.

1203 there's a mental difference between being pregnant and there being a baby, and that was a thing that I had underestimated the 'oh my goodness' factor from that first, um, scan, was ... just that, er ... because quite emotional, you know. I felt pregnant beforehand, but it made the reality of there being a baby in me [laughs] ... just bang!

Women demonstrated an increasing awareness of their unborn child following ultrasound examination. The meaning of pregnancy changed from the physical state of 'being pregnant' to the realisation that they were carrying a child. It has been acknowledged that this recognition is not unique to women (Draper, 2002). During

the interviews it became apparent that seeing the ultrasound image also played an important role for men in accepting the reality of impending parenthood. Sandelowski (1994) suggest that if only for a short time, ultrasound creates an equal relationship between expectant mothers, fathers and the 'techno' fetus. All of the women were accompanied to the scan by the baby's father. They viewed it as an opportunity for men to be involved and participate in the pregnancy rather than being casual observers in the process. In this sense, the scan was a joint undertaking. Women described how important it was for the father to be able to see the fetus on the screen. They discussed how the first scan made it real for partners:

402 it suddenly became very real for him at that point: I knew I was pregnant but he'd just been living with a grumpy, sickly woman for three months! So actually seeing the baby was, was a real, was a big moment particularly for him,

902 I think it was more emotional for my husband because that sort of made the pregnancy real for him for the first time, so I think that was really nice for him, I sort of remember him kind of tearing up when he saw the little, um, little baby on the screen.

One husband talked about how seeing his unborn child during the scan became a defining moment in the pregnancy for him:

It's a realisation that there's responsibility coming, and that that child is yours and you've got to prepare yourself. You go back to work the next day thinking, I need to put everything together. You know, I've got to get it all in order now, I can't say, right I'll do that another month, do that another month, I'm going to be a dad soon, I've got to do something about it. So yeah, that definitely helped for me, I think,

4.1.4 The Public Fetus

The standard ultrasound image of the fetus is instantly recognisable in society today, however the real time image is not the only image that holds significance for women. The interviews highlighted the importance of having visual evidence to take away to present to family and friends. Roberts (2013:111) suggests that making these images public, forms part of the "iconography of ultrasound and the range of fetal representations" in society. Participants talked about using the visual image as a way of introducing the baby via a range of media. One woman described how she used the ultrasound image and social media to announce her pregnancy:

1501 Yes, yeah, um, we ... er, scanned them in, emailed them round, the whole lot of them, um, round to parents and things and then picked the nicest one and put that on Facebook so, you know, everyone can see it. The one that looks like, you know, the baby in there!

How parents decided on the 'nicest image' of the fetus was unclear, yet participants frequently talked of a selection process to find the best image of the baby when presenting it to the world.

Despite critics arguing that the experience of pregnancy is not suitable for public discourse and should be a private encounter (Cohen & Raymond, 2011), the interviews suggest that sharing ultrasound images in this way has become a normal activity in pregnancy. The interviews validated the concept that family-building begins in the antenatal period and that these images have replaced the traditional 'baby's first photograph'. Beginning the family album before birth and the importance of keeping the photographs was frequently discussed:

703 They're all in her baby book, and all stored. [Laughs] Yeah. Very proud

1303 we've put them into an album, so we've made a first album of our little girl,

1101 She'll be able to see, I think it's nice also for her, because when she's older she'll be able to look back and see them

In essence the twelve week scan offered the first visual confirmation of the pregnancy for both parents, being able to see the baby helped promote a feeling of reality and evoked strong emotions. It provided reassurance that the fetus was healthy. It allowed women and their partners to start considering their new family and how life would change. Many of the women described this scan as the most significant and important scan in the pregnancy and saw it as the first step on the road to parenthood.

4.2 Second Trimester

Unlike the first scan when the pregnancy is often kept a secret, the second scan is viewed as more of a social occasion. Women often attend this scan with several family members to 'watch the show'. All of the women described looking forward to this scan. In contrast to the first scan this scan appeared to hold less clinical significance for participants.

4.2.1 It's just something you do!

There was a general acceptance that the 20 week scan was part of normal care and that there was an expectation to attend. When questioned about what influenced their decision to have this scan it was apparent that there was often little consideration given to its true purpose and potential consequences:

1002 – Mainly because it's just sort of, you know, it's what ... you know, I just sort of go with the [laughing] flow, you know, you turn up to your midwife appointments, you turn up to your scan! [Laughs]

102 Um ... I think ... mostly because it was part of the process. I didn't see it as optional.

The extent to which ultrasound is established as the norm in pregnancy is evident. These narratives reflect the overall opinion of the women interviewed and none of the women had considered declining the scan.

There was also a sense of less apprehension surrounding this scan. Some of the women viewed this scan more as a formality and it was seen as less significant than the first in terms of fetal development. One explanation for this is the belief among some women that any major problems would have been detected at the 12 week scan. They considered that the 20 week scan was of less importance and its diagnostic value was not as clearly recognised as the first scan:

501 But I mean I think we were a lot more relaxed about that, because you know, I felt good in myself through my pregnancy and everything had been OK at the 12 week scan, and so we were more relaxed about it.

303 Because obviously they pick up things, you know, if there are huge abnormalities that they'd pick up at the first scan anyway.

4.2.2 Just a check

When the women were asked what they understood about the reason for the detailed scan the general understanding was to 'check' the baby. However there was also a belief among some that this was more of a concern for the health care professionals and they would only worry if a problem was discovered:

1301 So I knew that that was quite a medically important, in fact I think it was more for them rather than us actually, just to check off those significant medical issues that can't necessarily appear at the 12 week but can appear at the 20 week.

901 Um, so ... but I just was kind of not really paying attention to the medical side of it, it was much, we were in our little bubble about we're having a baby and it was ... more information for us about that, really. And the medical people could do what they wanted with their half of it, but I didn't feel that that related to me almost, in a way.

This suggests that women potentially feel removed from the diagnostic element of the scan and points to a sense of the clinical outcomes being owned by the medical profession.

Some women did identify that the purpose of the scan was to screen for congenital abnormalities. A significant number of the women recalled the sonographer checking for cleft lip, the heart and the limbs. These structures are easily identifiable on the screen and the fact that women clearly remember these checks reinforces the visual impact of the ultrasound image:

1003 So it was obvious that they were looking at the organs, so that they were there, that the bladder was full, the heart was doing its thing, legs, bones there, same length, um, looking at the face, seeing if, you know, cleft lip and palate.

Information is often acquired through the experiences of family and friends. The experiences of others featured in the narratives of women in this study as they made sense of their own anxieties. For example:

901 We knew it was a kind of abnormalities thing and, um, my brother and his wife, their, between their two children they'd had a pregnancy that had been terminated because of a genetic abnormality.

One lady who had since had two other children talked about her naivety in her first pregnancy:

701 I think at that point, um, I, my understanding of the 20 week scan was you got a really nice picture of your baby, and that was pretty much it.

She went on to talk about how her understanding had changed following the experience of a friend:

701 Um, I had a friend who had a very sad 20 week scan subsequently so I've come to realise the importance of the scan and what it all means, but I don't think I understood the importance with my first pregnancy of the 20 week scan.

The interviews highlighted that this scan was an important event in the pregnancy calendar for several reasons which did not necessarily include fetal wellbeing. Women described the anticipation of having another opportunity to meet the baby, it was often viewed more as an opportunity to get photographs and in many cases, to find out the sex. Whilst some women recognised that it gave them information regarding fetal health they were generally unclear on the conditions that ultrasound can detect or had been influenced by the so-called 'horror stories' of people known to them.

.4.2.3 Pink or Blue

The idea which has already been raised regarding the conflict between ultrasound as a medical or social event has, in part, been created by its position in offering parents a way of knowing their unborn child. In a quest to increase knowledge of fetal life the appeal of ultrasound has offered parents the chance to see their baby 'smiling', 'waving' and generally displaying characteristics which in reality may not exist. In recent years parents have also been presented with the prospect of finding out the sex of their child at the 20 week scan. This has further enhanced the perception of this scan as a social rather than clinical event.

Twenty nine of the women interviewed opted to have the sex revealed at this scan, the importance of finding out the sex was given as their primary purpose for having the scan, and this overshadowed the concern regarding fetal health:

1503 *Well to me that was the gendering scan, as far as I was concerned! [Laughs]*

203 We decided we wanted to find out the sex so ultimately for me, even though I know that's when you can find out obviously if there's anything particularly wrong, anything else, I was just more focused on finding out whether she was pink or blue.

The decision to find out the sex of the baby often lay with the mother. The reasons behind this desire to 'know' varied, however, the overall reasoning suggested that having pre-existing knowledge would allow them to plan and control the future. This was centred on being able to build up an image of their life with the future child:

302 I think, one of the reasons we wanted to know was we, for us it was just then easier to visualise just our ... our future life, and visualise this little person, we wanted to sort of know, you know, we could imagine having a little boy or imagine having a little girl.

1501 Yeah, and sit and daydream about the future, you know, what will he be like, will he like football, will he like video games, that sort of thing. So yeah, just sit and imagine as the years go by, what they'll be like. Yeah, just happy little daydreams!

Others talked about having time to 'prepare'. If the child was not the hoped for sex, they preferred to experience feelings of disappointment at the time of the scan rather than when the baby was born:

1202 I know we don't, we don't want to have this [sounding disappointed] 'oh,' effect when she's actually there, seeing that it's a girl and not what we were hoping for, a boy, but to give us the time to ... to prepare for the idea that it actually is a girl. Um ... and we were honestly disappointed when we found out

1101 That was quite important. I really wanted to know. And I think it helps prepare dad, because with a first pregnancy he was obviously very keen to have a boy, and it turned out to be a girl, so I think had ... had we have waited until birth date he wouldn't have had that time to prepare himself.

The importance that women placed on their partner being disappointed with the sex of the child raises interesting insights into gendered expectations within society and responsibility for keeping partners happy. It may also subconsciously be a tactic to encourage men to engage with the pregnancy and the unborn child. Today's society places a strong emphasis on 'knowing' which indirectly relates to being able to impose a sense of control and order. This desire extends to many aspects of our lives and women viewed the knowledge of sex as a way of offering an element of control in relation to managing expectations at the time of birth

4.3 Third Trimester

All of the women interviewed underwent two extra scans in the third trimester as part of their participation in the POP Study. The women in group one and two did not receive feedback regarding the results of the scans, the women in group three received feedback according to the study criteria.

4.3.1 Understanding of risk: “It’s just looking”

The interviews highlighted that women were prepared to undergo regular scans in the third trimester without questioning if there were any potential side effects. The nature of ultrasound scans means that they are often viewed as non-invasive, they are not considered as medical examinations and there was little understanding of risk. When women were asked their views about the risks associated with having serial ultrasound scans they responded:

901 I don’t see it as intervention any more than going for a midwife check. Because it’s not doing anything to you, it’s just looking

803 Um ... so, well certainly not kind of in terms of the actual procedure, it’s kind of a non-invasive procedure.

Two of the participants did briefly consider the question of safety when it was raised but concluded that the risk was minimal in comparison to the benefit of having a scan:

901 One little concern, obviously, you know, that the more ultrasound, whilst not being an X-ray, I realise that there are some, you know, not exactly danger but some, you know, potential slight risk of having those extra ones, but on balance, um, I think definitely the later scan ...

401 we think it’s safe but there may be something in the future that comes up saying that actually we shouldn’t have been taking scans of women,’ but I can’t see there being any disadvantages.

Zechmeister (2001) suggests that women’s acceptance of ultrasound as a benign technology “lies in their uncritical faith in medical expertise, inherent in the doctor knows best ideology”. The interview data would seem to support this view. It would appear that even if there was a small risk, it was one they were prepared to take in order to gain reassurance.

4.3.2 Pregnant women are a worrisome lot, (participant 1003)

One of the main themes which emerged from the data concerned women's continuing and at times, exponential anxiety over the general wellbeing of the fetus throughout the duration of their pregnancy, and the interplay that ultrasound scans had in relieving this anxiety and providing them with reassurance that all was 'going well'. Previous studies have highlighted the role of ultrasound in reducing anxiety earlier in pregnancy (Section 2.4). However, anxiety surrounding fetal health is not limited to the first and second trimesters. Despite women having the opportunity to listen to the fetal heartbeat and experiencing physical evidence of fetal movements in the third trimester, women still expressed feelings of anxiety about the baby. The data suggests that the feeling of reassurance which followed the ultrasound scans was consistent throughout the three trimesters.

Women described the third trimester scans as a positive experience offering information about the health of the baby. This was regardless of whether they received feedback from the scan or not. Without exception they all talked about the feelings of confidence and reassurance which the late scans evoked:

1501 Just completely reassurance, I suppose that is the strongest word for me when it comes to thinking about my scans was reassurance,

502 actually then going in for that sort of latter week scan was quite a reassurance because you knew, you could see again that everything was absolutely fine, you could see where the cord was, I could see which position the baby was in, so I knew, you know, even though it was four weeks before the due date I knew that the baby was in the right position and that sort of thing. So, um, that was quite reassuring I think, that last one, particularly. Yeah.

Taylor (2008) suggests that the reassurance provided by ultrasound only exists as a reaction to its repressed opposite 'dread'. Some of the women expressed this dread in their narratives situating the root cause of anxiety in pregnancy as concern over fetal health, more specifically, the death of their unborn baby:

901 If it prevented a disaster. I mean I know some, I know, well one of my friends lost a baby at 38 weeks and that was the ... apparently the cause [cord around the neck].

403 Because, you know, the idea of being able to see further along that everything's all right, that ... A woman I used to go to sixth form with is a relative of someone I

work with, and she lost a baby at full term, because of a cord accident, so the thought of being able to make sure everything is still fine further along was very reassuring as well.

It would appear that scans offer women a sense of empowerment and a feeling that they are 'doing the right thing' for their unborn child. Harpel (2008) talks about anxiety being caused by the unknown aspects of pregnancy. For these women the late scans provided them with a means of 'seeing, which led to 'knowing' that their child was healthy.

4.3.3 Seeing the Benefit

Women were asked to consider what they thought the benefit of a third trimester scan would be. The responses revealed that many had little knowledge of, indeed doubted, its diagnostic capabilities:

1001 I don't see, I'm not entirely sure whether there is a benefit from the medical side, but I, I think there would be a benefit for a positive, um ... feeling of women in their pregnancy. Just about emotions, I think.

202 I mean I don't, are there things that you can pick up in the third trimester that you wouldn't pick up in the other scans?

1003 my understanding is that scans aren't actually very good at predicting; even a scan isn't very good at predicting the size and weight of a baby.

Despite this there was an almost unanimous opinion that introducing an extra scan in the third trimester would be a positive thing. The rationale for this related directly to their clinical outcomes. Some women viewed it as another opportunity to see the baby, whereas women who had experienced problems regarded it as a more reliable method of fetal surveillance than routine care:

101 I think it's a brilliant idea absolutely. As I say, I think from my point of view it's so important to be able to see your baby through pregnancy, to have that reassurance.

802 [intra uterine growth restriction and increased amniotic fluid] Um ... [pause] part of me would say yes, purely just because of the two things, the two situations that we went through weren't picked up by routine care.

903 [reduced amniotic fluid] You know, because you hear of babies being, you know, stillborn and being born perfect, you know, just within those last few weeks. An I just

think, you know, if I hadn't have had the POP scan, you know, could that have been me possibly, you know, with the low waters and the placenta possibly having sort of oxygen implications for [name of child]. So yes, I'm really, really grateful for that one.

Only one participant did not advocate scans in the third trimester. Surprisingly she was in the group who did not have results revealed and subsequently had a low birth weight baby, her concern was that introducing more scans would potentially take away funding for midwives:

102 if it was me I wouldn't spend money on more scans, I would spend money on better community midwife ... I think the scanning, I think the scanning as it is, certainly for me, was sufficient, and I worry slightly that the idea of bringing in more scans in the third trimester will take funding away from the community midwife area, which I think is where it is more needed.

Women could see little disadvantage to having scans in the third trimester, the main concern revolved around service delivery and cost implications:

701 Um, I would imagine it's ... the disadvantage I would think about is just the cost, the cost to the NHS, but for a pregnant woman I can't see what

503 I think, I don't see any negatives, really, um, other than potential cost I suppose but, um ... Yeah, I really, I really can't see any negatives to it at all.

The fact that most women expressed this desire to have extra scans has implications for the way technology is perceived as superior to clinical care. The concern over whether this would take away from service delivery signals that women value the one-to-one interaction with a specialist during their pregnancy. It questions the potential deskilling of obstetricians and midwives if we rely on ultrasound as the primary way of monitoring fetal health. Furthermore, it is interesting that women considered the financial implications of providing extra scans. This understanding of the costs of healthcare provision is likely to be influenced by the fact that the majority were professional middle class women.

A number of the women said that although they would like extra scans in subsequent pregnancies they felt that if funding was an issue it should be restricted to first pregnancies. In contrast to Harpel's (2008) study on anxiety which found no difference in anxiety levels between primigravida and multigravida women, there was

a general feeling that having been through one pregnancy they would 'know what to expect' and be less anxious next time around:

03 especially with your first baby, um, because you don't know what to expect because it's your first child I think it's even more important with your first one because then you know things are, you know, heading in the right direction, and then you may be more relaxed in your next pregnancies.

Women who had subsequently had second babies described feeling much less anxious the 'second time around'. A successful pregnancy increased their own embodied knowledge and made them less reliant on technology for reassurance:

1501 Yeah Yeah, I would say that definitely is true, having done it once you do feel a lot more confident going into it the second time, it is a completely different kettle of fish, I think for the first one you probably do worry a lot more, for the second one you know that you can, you know, do nine months of pregnancy and produce a fully healthy child at the end of it, so you've got more faith in yourself and more faith in your body, I suppose.

This indicates that the level of anxiety described during the interviews could be more prevalent in first pregnancies and is a factor which needs to be considered when examining the implications and feasibility of introducing scans in late pregnancy.

4.3.4 It has its limitations

The diagnostic capability of ultrasound in the third trimester can be compromised by fetal size and position. Scans can provide results which are falsely reassuring or raise concerns which may be ambiguous or wrong. Women may be given information about the fetus without being offered a clear diagnosis or outcome for the pregnancy. With the potential to intensify anxiety during pregnancy, women were asked how they felt about the possibility of the scan providing equivocal information.

101 knowledge is power, you know, no, I, whether it's negative or positive I do think it's beneficial to know.

501 I think it gives you time to prepare for it if nothing else. I mean you're going to find out eventually, aren't you, and why not be prepared if you can be? And I'm sure in some cases there might be something that they can do immediately rather than, you know, there'll be a delay after the birth. So yeah, I don't, that's definitely not a disadvantage.

They all agreed that the possibility of increasing anxiety was less significant in comparison to having knowledge which may help them prepare for complications at birth.

4.3.5 Sound and Vision

Vision both observes and constructs our social world and therefore incorporates elements of both seeing and knowing. Boundaries between seeing and knowing are therefore indistinct and have become perilously intertwined' (Jenks 1995)

The most arresting theme to emerge from the data was the impact of the ultrasound image and the experience of 'seeing' the unborn child. This superseded all other aspects of care in 'knowing' that all was well with the pregnancy. One woman summed up the general sentiment about the value of scans across the interviewees, when she claimed the most important role of ultrasound was:

902 I suppose visualising, a picture tells a thousand words.

Petchesky (1987) talks about ultrasound arousing a sense of control for pregnant women that they would not achieve if left to traditional methods of surveillance. Reflecting on this, women were asked how 'seeing' the baby compared to other methods of monitoring fetal health, such as feeling fetal movements or the midwife listening to the fetal heart:

703 Um, you know, it's all very well someone looking at the outside telling you everything's all right but, you know, you want them to have a look inside and check it's OK as well. But yeah, it is reassuring obviously because they know what they're doing, but not half as reassuring as being able to see him.

Such was the yearning to constantly survey the fetus, that during the interviews the women talked about their desire to have a 'window to the womb' to enable them to check the progress of their unborn child.

1001 During the first pregnancy I always said that I wish my tummy was out of glass and I could just look in and make sure everything was fine. I don't know why that is, it's not evolutionary, why that has not been developed!

203 it's almost like you need like a little sun-roof in your tummy to say, 'Is everything all right in there?' Because sometimes you don't feel them move as much, they might

have a day where they don't, they're not as, and you think, and you're just constantly worrying, because you can't see

Women were asked to describe why seeing the baby was such an important factor in reassuring them about the health of the baby:

1301 Because I could see, I have no medical training whatsoever but I could see baby's moving, and that the heartbeat was normal

602 Because ... I don't know, I guess you get ... [pause] I don't really know, I guess because you get to see them and ... that's not something that you can do at home or at any point in your pregnancy unless you have a scan, and it feels like an important ... not necessarily important but it just feels like something not everybody gets to see,

There was little evidence that women understood the limitations of the scan and that it represents a snapshot in time, or that pregnancy is a dynamic process which can rapidly change.

4.3.6 Bonding with Baby

The validity of ultrasound and its role in bonding is a contentious one. As already highlighted, many women now attend clinics for private 'bonding scans'. Despite this, there is little empirical evidence available on this subject. In an effort to gain further understanding on this topic the women were asked if they felt the scans had helped them bond with their child. The results of this were mixed and reflected previous studies:

101 Oh definitely. Definitely. Absolutely without a shadow of a doubt. I think having the extra scans, and also knowing that she was a girl and naming her, we used to talk to her, it was almost as if she was here but there was just a bit of skin between us

802 So I think the extra scans made the pregnancy more exciting, made me bond with the bump, but that didn't then translate to instantly bonding with a baby.

302 Did the scans help contribute to bonding? They certainly helped contribute to just ... visualising that he was about to be here and he was real and, because with the first birth it is hard to imagine yourself as a mother. Um ... but it probably didn't make an awful lot of difference.

This suggests that although the scans played an important part in the reality of pregnancy and motherhood this may not translate to feelings of bonding. The scans also appeared to play a similar role in helping their partners to connect with the baby.

302. [name of husband] came with me to all, for all of the scans. Not because he needed to but because he wanted to, you know, I think he ... I think it was really, really, it's nice for the partners because you're very aware of the pregnancy, particularly in the latter stages when they're kicking away like crazy and having the hiccups and funny things like that, but it's much more of a distance experience for the father, and so I think it was really nice for him to come along to those scans and be involved as well

Seeing visual evidence of the child appeared to be more important to men than the outward physical signs of late pregnancy. The ability to see the baby moving offered them an experience that they felt was superior to feeling the movement which they often found difficult.

4.3.7 Marking Time

In the first twenty weeks of pregnancy the woman is the centre of attention, announcing the news, seeing midwives, having blood tests and scans. In comparison for low risk women the next twenty weeks can provoke a sense of abandonment when they are left alone to 'grow' the fetus. This feeling of marking time was a reoccurring theme during the interviews. Women expressed the view that the period of time between the 20 week scan and birth was too long. The late scans were consequently seen as milestones to look forward to during the pregnancy:

702 I mean 20 weeks, halfway through your pregnancy to the end I just think seems like a lifetime. Um, you know, I mean I would pay to have that extra scan, you know, so that shows you how important it would be for me.

301 I think I would have found it a very long gap to not have had any from 20 weeks to sort of nearly 40 weeks potentially. So it is, it does sort of help your, it sort of marks milestones on your pregnancy

1203 with the scans coming up you look to them ... um, and it's hard to know quite how it would have been without those, those points because they gave very firm ... dates to look towards, but also they were a point of, um ... they were if you like those stepping stones of reassurance for me,

The knowledge that they would see the baby on a regular basis offered them goals to reach which in turn marked the countdown to birth.

4.3.8 Countdown to Birth

As there is currently little evidence exploring the relationship of late trimester scans in relation to psychological planning for the birth, this study sought to explore its potential impact. The results suggest that seeing the unborn child later in the pregnancy played a significant part in the mother's thoughts on labour and the transition to parenthood:

1401 Well it makes it real. There comes a certain time where you actually think ... oh my God I have actually got to get this thing out of my body, and when you see it and you see it getting bigger you, it sort of, you start to come to terms with, not come to terms with it but to accept more.

1603 Um, and then the late one was just so important because we could see her so clearly, and it was just ... it was just so great to see her face and just, you know, prepared us for this, you know, there's a person coming to live with us, you know!

1003 Yeah, it's just ... it's happening and you know it's happening but it's still slightly unreal, that there's really going to be a baby popping out. And it helps to make it more real to actually see it.

Most women approach the impending birth with a plan for labour. Individual expectations often lead to feelings of disappointment if the birth does not go to plan. This in turn can have psychological consequences such as postnatal depression (Koo, *et al* 2003). The presentation of the fetus is an important factor in defining the type of birth the woman may experience. All of the women in the POP study were made aware of the presentation of the baby at 36 weeks. For the women in group three whose babies were breech⁸ this presented them with a radical rethink regarding their birth plan. Despite this, they valued it as a positive thing, providing an opportunity to re-evaluate their plans:

703 Um, I'm pleased, and I'm pleased that it happened at like 36 weeks because it gave me time to get my head round it, because I was really, really gutted, absolutely ... really gutted. I think because the whole pregnancy I'd geared myself up for, I was

⁸ This occurs when the fetus presents 'bottom-down' in the uterus

going to be this super-mum and pop it out to like ocean music or whatever! [Laughs]
Um, so I think it was good to have the time

1403 [breech presentation] for me the 36 week scan ... kind of, you know ... was a massive, massive thing for us because it changed the course of what was going to happen, how I was going to deliver my baby, and maybe prevented, you know, some awful scenario that I don't ... don't think anyone needs to dwell on.

One participant talked about the impact of finding out that her baby was breech:

1403 I was very, very emotional about it, I really didn't want a section. I really didn't want to. And it's, it is pathetic and I know it's really, but ... it sounds, like it's a rite of passage to ... give birth to your baby and kind of do it yourself. And I felt a little bit like I was denied it. Which I felt really really sad about, I found that really hard. I got over it, you know, I had to but ...

She was asked if she felt resentful that the scan had denied her the delivery she had envisioned

No actually, no I ... the scan I just, oh, I still have these moments where I think, if I hadn't have had that scan I'd just hate to think what would have happened. Just, you know ... I couldn't, I had nightmares, you know when you're very hormonal after you've had a baby, I had nightmares, reoccurring nightmares about the fact that I might have, you know, I would dream that I'd gone down to the, um ... midwife unit and after like 30 hours of labour, you know, various scenarios had happened. Um ... so that scan, I was just so incredibly thankful for.

This fear of being in labour with an undiagnosed breech presentation was a consistent theme amongst the women who had a breech presentation diagnosed at their 36 week scan:

1603 – That would be terrible. That would be really terrible because, you know, the difference between an emergency C section and a planned C section is huge. And having a planned C section, even though I didn't want it, you know, it was very relaxing and easy, there's no trauma to it, whereas going into labour and then having a C section is really traumatic, and I would not ... yeah, that would have been much worse.

Having knowledge regarding the presentation of the baby and its effect on thoughts of labour was not just specific to the women in group three. The confirmation that the

baby was in a 'good position' for birth inspired confidence in women as they approached labour and empowered them to achieve a positive birthing experience:

1802 It definitely, um, definitely made me feel better. Um ... after having like the antenatal classes obviously you want the baby to be head down, so yeah, it definitely made me feel better.

The findings suggest that using ultrasound in late pregnancy to determine fetal presentation could potentially have a place in reducing the psychological consequences that may occur when labour does not go to plan and women undergo emergency interventions. The strength of feeling that the women had about having the extra scans and how they influenced their narratives on pregnancy and childbirth was evident. It would suggest that while the primary purpose was offering reassurance, the scan also had an important role in helping women in the transition from pregnancy to parenthood:

1001 The only thing I can probably say is that they're really important for me. They're an important part of me being pregnant. Um, they help me to understand the whole, they help me through this whole process of becoming a, giving birth to a baby.

702 It just made me appreciate being pregnant, you know, what a miracle it is really, I just feel really privileged to have been able to see him grow that much. Um, you know, and ... it was just, you know, it's just, it was ... along with being reassuring it just made me realise that I actually had that baby and he was going to come eventually, not that you ever believe it but ... yeah.

4.3.9 "It's like chicken soup"

Throughout the interviews it was evident that the third trimester scans provided much needed reassurance to the women. Although they had little understanding of the diagnostic capabilities the scans rightly or wrongly instilled in them a confidence, that all was well with the pregnancy. One of the most striking moments during the interviews was when this participant was asked to describe what scans in pregnancy meant to her:

401 But I think that certainly, there's something about it psychologically that just makes you feel, you know, it's like chicken soup when you're ill, [laughing] there's just something about it that makes you feel better.

This statement portrays the feeling which came across in the interviews. It embodies the level of comfort that women get from scans. It implies that the scan goes far beyond reassurance to a level of being nurtured, soothed and looked after.

Ultrasound examinations played an important part of the pregnancy for all of the women interviewed. They were eagerly anticipated and seen as a positive event. Throughout the pregnancy each scan provided a distinct purpose and were seen as milestones to be reached, signalling a transition to the next phase of pregnancy. They not only provided reassurance regarding the health of their baby, but were an important part of the transition to parenthood, allowing them to meet and connect with their baby and imagine the future child. The later scans prompted thoughts of birth and enabled women to consider impending motherhood.

4.4 Research Participation

Undertaking research on pregnant women presents researchers with unique challenges. The POP study presented an ideal opportunity to gain an understanding of pregnant women's reasons for taking part in the research, what they hoped to gain from it and to explore their views on research participation. This section describes the participant's experiences of taking part in research.

4.4.1 I just wanted more scans!

The POP study offered low risk women a unique opportunity to have unreported extra scans during their pregnancy. All of the women who participated in the interviews had previously taken part in this study. Empirical data suggests that participants agree to take part in research for a variety of reasons, these include altruism, personal or financial gain and feeling ethically obliged (Wendler, *et al* 2008; Trauth, *et al*, 2000). During the interviews the women were asked to talk about their reasons for participating in the study. The extra scans in the third trimester played an important role in women's decision making on whether to take part:

1402 It's going to sound awful: just because I wanted more scans

1501 But yeah, primarily for a selfish reason, to get the extra scans, um ... to see the little wiggler in there, was the main thing.

303 The extra scans. Well one, I think it's good to be, um, participate in research anyway, but also from a selfish point of view getting to see your, see your baby and check that everything's going all right,

A significant proportion of the women were either from an academic background or working in research roles. These women talked about the importance of research as the primary motivation for taking part but still cited the extra scans as an added benefit:

1101 Well ... given my career background I know how important research is, it wasn't really, it wasn't an inconvenience to have the extra scans. Um, so I didn't mind, I was quite happy to help, and yeah, it was nice to get the pictures for [name of eldest child] for when she's older, it's nice for us to see that everything seemed to be going okay

802 I mean partly because I'm involved in research, so any time that I can then take part in research I want to, because we couldn't function without our volunteers so it

seems a bit silly to then refuse to be a volunteer for anyone else! Um, and again just the opportunity really to kind of have the extra scans and follow your baby through.

There was also an element of altruism and the potential to help others was an important motivator for some of the participants, this was often related indirectly to their own identity or the experience of someone important to them:

103 [age 40] I wanted, for women that were having babies later in life I just thought that might be more, that would be beneficial, that would be ... helpful to, to do that.

901 Because I think it's a really fantastic thing, you know, a bit of research, and the more that can be done to help more people have a kind of healthy full-term pregnancy the better. It's such a terrible thing when it goes wrong, I've got a friend who's had a series of things go wrong for her with pregnancies and, you know, it's completely taken over her life, really. Um ... so the more that can be done to stop that happening to people the better.

The desire to have extra scans was the primary factor in women's decision making process on whether to take part in the study and this superseded any other potential discomforts they may experience from participating in the study. The women were expected to provide a blood sample at each ultrasound visit. There were several women who admitted to having problems with giving blood however they were prepared to tolerate this as a consequence of having extra scans:

101 Um, it, if, in all honesty if, when you make the decision I think even though they say to you, 'Oh, you know, it does mean more blood tests,' and I struggle with giving blood, my veins are so deep, um, so I knew it was going to be an issue, and that far outweighed, you know, the fact that I was having the scans and getting to see my baby again far outweighed the downside of having to have the blood tests.

1403 Um, and definitely the scans – I hate, which is ridiculous I know, having my blood taken, I absolutely hate it! Um, so [laughing] you would think that that would weigh out the scans, literally that much.

During the discussions it became apparent that decision-making about participation was the exclusive domain of the women. There was little mention of partners being involved in this decision making process although they were asked to contribute by providing a saliva sample for DNA analysis. The implication of this may be that the

responsibility for decision-making in pregnancy seems to rest predominantly with the expectant mother.

4.1.2 Feeling Special

Evidence suggests that research participants often have misconceptions and difficulty understanding the nature of research participation. Recruitment for the POP study was undertaken at the first scan appointment. Prior to this the women had received an invitation letter and participant information leaflet detailing the purpose and design of the study. There was a robust consent process which consisted of a 15 minute interview with a research midwife at which point the study was described in detail. This process placed emphasis on ensuring that the participants understood that the ultrasound scans would be largely unreported except for the defined criteria. The criteria for non-disclosure of results were reinforced at the beginning of each visit. Interestingly, in interview, the women were asked to recall what information they had expected to receive following the scan and there remained some understanding that the results would not be revealed

1603 Um, if I remember correctly they said that we wouldn't really get any specific feedback, that it would just kind of, the data would go into the study, that if we ... um ... that if we saw anything that we needed to follow-up then we would be referred to somebody but that we wouldn't be getting any specific feedback the way we did at the 12 and 20.

1103 I understand that they wouldn't be able to tell me if anything, if they picked up anything that was wrong with the baby at either of those two scans, but they would be able to tell me if the baby was breech – as she was.

This understanding was tapered by a strong belief that if there was a problem it would be revealed to either them, or one of the health professional responsible for their care:

1502 And I thought in my heart of hearts that surely if there was something serious they would do, they would tell someone, maybe not me but they would possibly tell somebody and then that could be brought to my attention.

1603 Er, figured if they, you know, if they saw something really wrong they would have referred us to somebody even though they wouldn't have told us something about the scan.

This ability of participants to differentiate between research and clinical care has been highlighted in reviews of perinatal trials (Snowdon, Elbourne, & Garcia, 2006). Participants in research studies often assume that taking part in research means they are receiving better care and by virtue an increased level of surveillance. This belief was evident among the women interviewed, as they talked about their feeling of being 'looked after':

602 I definitely felt a bit special, I would say, yeah. You know, coming in and being able to have those scans and ... I felt like if there was anything wrong I, it would be picked up and I would be looked after. So yeah, I definitely felt like I was properly being looked after.

401 it's just the idea of going to the hospital, you're going to the big hospital, the big building, and someone with a great big machine is having a proper look at your baby, and in a way that listening to the baby and having a feel and taking measurements isn't, you know, in our minds as being un-medical [laughing], um, as a layman, you know, having a look and someone having an actual look at the baby makes you feel like, you know, you're getting that much more attention.

803 I think being within a kind of a research study you ... you kind of feel you're giving something, and I think there's always this kind of reciprocal feeling that as a patient you're doing something additional and, um, the researchers, although they shouldn't treat you any differently, are kind of actually very grateful for what you do and so there's always kind of ... um ... I think you do just get slightly better care, but not intentionally, but I think it's just you've got a point of contact.

There is also the potential for research participation to have an adverse effect. Although the majority of women described taking part in the study as a positive thing, one woman who did not have scan results revealed consequently had a small baby. She believed that taking part in the POP study negatively influenced her standard care. She felt that her midwife was less diligent in monitoring her baby's growth in the assumption that any problems would be detected and reported by the scan through POPs:

802 With relation to the, er, the outcome of the fact that our son was small I do wonder if because we were on the POP study ... having the POP study was

reassuring from our point of view but then maybe that was a subconscious thing from the midwife's point of view of, well everything's already been [checked]...

The present study affirms and strengthens the assumptions of previous work in terms of the understanding of research. It confirms that there is lack of awareness in the distinction between clinical care and research and that there may also be a belief amongst health care professionals that participation in research is a substitute for clinical care.

The fact that women felt reassured and 'looked after' may be a reflection on the lack of midwifery support in the community. Staff shortages and high caseloads are exerting increasing pressure on midwives. Anecdotal accounts from women support this as they talked about attending scans during the study being the only time they had any continuity in their care. As the majority of the scanning was undertaken by midwife sonographers they viewed it as an opportunity to seek advice which would normally come from their midwives and often described it as the only time they felt 'listened to'.

4.1.3 People and Places

It was very telling that the interviews also gave women a voice to express their views on maternity care and several issues were identified as being important to women. In relation to their experiences of ultrasound, it became apparent that one thing which they valued was the environment in which the scans were undertaken. The research scans were performed in a clinical research facility which is a special unit for research participants. This provided a quiet and relaxed environment. When discussing their participation in the study a number of participants compared the experience of their first scan which was performed in the hospital ultrasound department to the experience in the research facility:

1501 Yes, because obviously you go somewhere else, and the thing that made the difference was you're not sitting in the waiting room with lots of people, so I probably felt more relaxed that if we had questions that it would have been fine,

1403 The other thing is I think the waiting room downstairs ... goodness, there's nothing people can do about it I know, but, um ... you certainly got a sense that there were, it was very much a mixture of lots of different people having lots of different scans, and that some people were coming out, and I know, they looked like they had

come from another room, you know, clearly there were things, you could see where there was sadness rather than like joy, and I think that's really, really hard for everybody.

Previous data suggest that this anxiety may be increased prior to scans (Molander 2010) and is assumed to be a natural reaction to the realisation of what the examination may reveal. The statements above suggest that some anxiety may also be created by the environment and observation of others' experiences.

Several qualitative studies have identified that women value the attitude of the sonographer and the way information is presented to them (Molander, 2010; Elkin, 2004). During the interviews women also talked about the importance of the person performing their scans:

1402 It was kind of, you know, they were happy to talk to you and you sort of felt, well, I'm sure they were obviously on a timetable but I never felt like that whereas I felt slightly with the 12 week that it was, you know, we've got eight rooms, we've got eight sonographers and we've got, you know, 120 people to see between eight and eight and, you know, you ... you're in and out and it sort of felt a lot more ... clinical, I think

1603 I think that's really, really, really important. Um, I think that the way they act is really important. Because I've had different, I've had medical scans before where the person looking at the screen had a really bad demeanour, and it made it a really traumatic experience, and I think ... if they're just careless at all in what they say or how they say it, it can make it really worrying in a way that it doesn't need to be.

Due to the nature of the research the ultrasound scans were longer than routine scans. The extended appointment times enabled the sonographers to spend more time building up a rapport with the parents which in turn led to them feeling more relaxed and able to ask questions. They valued the time taken by the sonographers which may have influenced the recollection of their experiences. In reality sonographers have limited time in which to perform necessary checks, having time to talk and listening to women's concerns often takes a back seat. In standard practice scans are undertaken in a pressured environment and the reassuring effect they gained from the scans may not be as evident. The findings raise important questions pertaining to the current delivery of obstetric scans and the environment in which they are conducted.

5 DISCUSSION

5.1 Summary of findings

The dissertation has sought to describe the range of experiences of women undergoing third trimester ultrasound alongside routine scans in the first and second trimesters. The majority of previous studies examining women's experience of ultrasound are focused on the first and second trimester. The uniqueness of this study is that it provides an insight into women's perspectives on late pregnancy which have previously been unexplored. The interviews raised questions pertaining to the role of ultrasound in preparation for childbirth and motherhood. They highlighted that previous areas of professional concern relating to women's understanding of ultrasound remain unchanged. It raised questions relating to the environment of scanning, the experiences of research participation during pregnancy, and the implications of the findings for routine antenatal care.

Although understanding of the diagnostic capabilities of ultrasound was generally poor, the women were able to assign a basic clinical purpose to each of the scans in the different trimesters. They identified that the first scan was to date the pregnancy and the second to check the health of the baby. The last scan was important in providing information regarding the presentation of the baby and provided visual evidence that it was growing. There was no disparity in the fundamental meaning of ultrasound throughout the trimesters; however its focus in relation to the key themes changed throughout the pregnancy.

The narratives revealed that the first scan was perceived as the most important scan and was all important in confirming the reality of the pregnancy. Women described feeling more anxious regarding the results of the first trimester scan as opposed to the second trimester scan. The heart of this anxiety was the fear of miscarriage in the first trimester which is significantly higher than the risk of fetal abnormality and may account for the increased anxiety surrounding the first scan. Socially, there is a greater awareness of miscarriage. In comparison women carrying a baby diagnosed with abnormalities are often facing termination of the pregnancy and do not publicly share their experiences.

The second scan was approached with less apprehension. Although the subtext was the assessment of fetal health, it appeared to hold a more social significance for many of the women. Previous studies which identified a gap in women's knowledge about the 20 week scan were undertaken over a decade ago. The interviews revealed that this gap in knowledge still prevails. In response to previous findings a concerted effort has been made over the last decade to ensure that women are informed before consenting to undergo anomaly scans. The Fetal Anomaly Screening Programme (FASP) has introduced written and web based information for pregnant women. The findings suggest that further studies need to be conducted to re-evaluate the current strategy in providing information to pregnant women, and to consider how best to improve knowledge of ultrasound as a clinical examination, and dispel its position as a social occasion.

In terms of the three different groups of interviewees their experiences of late pregnancy ultrasound were comparable. The interviews suggest that ultrasound played an important role in alleviating women's fears in the third trimester. Women talked about the uncertainty of not 'knowing' what is going on inside them. Instead of relying on their own instincts and physical signs to reassure them they relied on the information provided during the scans. Roberts (2013) suggests that feminist theory tends to position ultrasound as an oppressive technology which influences women's experience of pregnancy. Harpel (2008) suggests that the anxiety women feel in pregnancy is a social construct imposed on them by technology and they use the availability of scans to control this anxiety. Despite this, it was viewed positively by the women and the pleasure they gained from it was symbolic in their narratives. Indeed during the interviews women questioned how previous generations in the family had 'coped' without scans. Women made a conscious decision to take part in the research, and used it as an opportunity to reduce their anxiety. This in turn led to a more relaxed psychological state of wellbeing as the meaning of the scan became less focussed on being pregnant, and turned towards the impending birth and parenthood.

This study is unique in exploring the role of ultrasound in relation to birth experiences and transition to parenthood. The extent to which late scans may influence the experience of birth needs to be carefully considered given the increasing evidence of the influence of birth experiences on maternal well-being and attachment post birth

(Koo, Lynch & Cooper, 2003). The findings revealed that using ultrasound in late pregnancy to determine fetal presentation and position resulted in good birthing experiences for women. For some women knowing the baby was in a 'good position' enabled them to approach labour confidently, for others who were diagnosed with a breech baby it allowed them time to re-evaluate their expectations. The definition of a good experience did not necessarily mean achieving a vaginal delivery. Women also described having a planned caesarean as a positive event in comparison to having an emergency intervention during labour.

Becoming a mother represents a major life changing event. Many variables influence this change and subsequent maternal attachment to the infant (Mercer 2004). A study examining prenatal attachment and the relationship between mothers and infants found that women who indulged in prenatal fantasy about the baby interacted more with their babies (Siddiqui & Hagglof 2000). The narratives suggested that late ultrasound scans may facilitate the transition of 'becoming' a mother by providing women with concrete visual evidence that the child existed, allowing them to think about the reality of having a child and becoming a mother.

The interviews also demonstrate that aside from its obvious visual allure, women valued the time and opportunity it offered them to have contact with a health care professional. Women expressed dissatisfaction with the current delivery of care, highlighting a lack of continuity and limited time during midwife appointments. This may be a contributing factor in increasing anxiety and feelings of being unsupported in late pregnancy. Although the level of reassurance that women described during the third trimester scans related to 'seeing the baby' it may also be attributed to their perception of the care they felt they received by taking part in the research. This raises concerns regarding understanding of research participation. Despite a robust consent process the research scans were perceived as an extra act of care and women believed that any concerns would be reported to them or their midwife. In some cases this belief also extended to the health care professionals. The results demonstrate that pregnant women were keen to participate in research especially if they felt it would benefit their baby. However the extent to which they considered the risks and benefits' were overshadowed by the opportunity for extra scans.

5.2 Limitations of the Study

The time interval between the ultrasound scans and the interviews ranged from 18 months to four years. Consequently, the likelihood of this time lapse distorting memory recollection has to be considered. According to Morse (2000) encouraging people to tell the story in their own time, and set the pace of the interview results in a resurgence of memories and emotions which bring back experiences. The approach to the interviews was structured to encourage the women to reflect on the whole of the pregnancy in the hope that this facilitated accurate recollections of their experiences. During the pregnancy some of the women underwent ultrasound for clinical reasons and around a quarter of the women had subsequently had a second baby prior to the interviews. The extent to which this influenced their recollection of events and their subsequent narratives is difficult to evaluate.

The generalizability of the study is limited as the women who participated were a self-selecting group who were predominately well educated white women in professional roles. Although the recruitment strategy did not target a particular socio-demographic group, the response from women in lower socio-economic groups or who did not have English as a first language was poor. The scans were undertaken in the context of a research study therefore there was less expectation of receiving bad news than if they were being performed for clinical indications. How this may affect women's anxiety, response and experiences is uncertain. The women were all experiencing pregnancy for the first time which may have made the impact of the scans more powerful, these feelings may be less for multigravida women⁹. A further potential bias is that most of the participants had taken part in POPs with the primary motivation of having extra scans. This needs to be considered and may have skewed the data positively towards the experience of late trimester scanning. Studies incorporating women from more diverse backgrounds and women undergoing scans for clinical reason would be of value to compare the range of experiences. A comparison of the experiences of multigravida women compared to primigravida women may also merit consideration.

⁹ a woman who is pregnant and has been pregnant before.

5.3 Implications for Practice

Ultrasound is not the sole technology to influence the way women now experience pregnancy. The availability of machines to monitor fetal wellbeing, and the increase in surgical interventions has contributed to the medicalisation of pregnancy and childbirth. Critics argue that while this has made pregnancy safer, conversely it has resulted in deskilling health care professionals (Sinclair 2009). The interviews identified women's unerring faith in ultrasound to monitor fetal health. Many of them admitted that they would forfeit a visit to their midwife in favour of having a scan. Introducing serial scans in pregnancy has the potential to change the provision of antenatal care. If midwifery resources are unable to provide support in the community it is understandable that women will turn elsewhere for reassurance. This in turn has implications for the provision of scans. There is currently a national shortage of sonographers and ultrasound departments are struggling to provide the minimum recommended number of scans. However, it could be argued that the introduction of an extra scan would reduce the need for emergency appointments and allow for better planning and use of resources. It is possible that late scans could be introduced to a selected population. Women experiencing pregnancy for the first time are likely to have more complications. It is interesting that during the interviews women unintentionally recognised this clinical need when they talked about scans being of more benefit in first pregnancies.

6 Conclusion

This study provides evidence that the ultrasound scans in late pregnancy held a strong significance for women and their partners and were positioned as an important part of the pregnancy. It has demonstrated that women have continuing concerns regarding fetal health throughout the pregnancy which are alleviated by ultrasound surveillance of the fetus. It supports data from other studies that 'seeing' the baby is the primary way of knowing that all is well for women and that the immediate knowledge gained from ultrasound reduces anxiety. The fact that the majority of women interviewed had undergone unreported scans strengthens the concept that it is primarily the visual image which is important in offering reassurance regarding the health of the fetus. Further studies are recommended to examine the impact of ultrasound on birth and transition to parenthood.

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8 Appendix

8.1 Information pack

8.2 Interview schedule