

## Author's Accepted Manuscript

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PII: S0266-6138(16)00041-3  
DOI: <http://dx.doi.org/10.1016/j.midw.2016.02.003>  
Reference: YMIDW1809

To appear in: *Midwifery*

Received date: 14 May 2015  
Revised date: 21 December 2015  
Accepted date: 1 February 2016

Cite this article as: Calida Bowden, Athena Sheehan and Maralyn Foureur, Birth Room Images: What they tell us about childbirth A discourse analysis of birth rooms in developed countries, *Midwifery* <http://dx.doi.org/10.1016/j.midw.2016.02.003>

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## **Birth Room Images: What they tell us about childbirth A discourse analysis of birth rooms in developed countries**

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### **Abstract**

#### **Objective**

This study examined images of birth rooms in developed countries to analyse the messages and visual discourse being communicated through images.

#### **Design**

A small qualitative study using Kress and van Leeuwen's (2006) social semiotic theoretical framework for image analysis, a form of discourse analysis.

#### **Setting/Participants**

Forty images of birth rooms were collected in 2013 from Google Images, Flickr, Wikimedia Commons and midwifery colleagues.

The images were from obstetric units, alongside and freestanding midwifery units located in developed countries (Australia, Canada, Europe, New Zealand, United Kingdom and the United States of America).

#### **Main findings**

Findings demonstrated three kinds of birth room images; the technological, the 'homelike', and the hybrid domesticated birth room. The most dominant was the technological birth room, with a focus on the labour bed and medical equipment. The visual messages from images of the technological birth room reinforce the notion that the bed is the most appropriate place to give birth and the use of medical equipment is intrinsically involved in the birth process. Childbirth is thus construed as risky/dangerous.

#### **Key conclusions and implications for practice**

As images on the Internet inform and persuade society about stereotypical behaviours, the trends of our time and sociocultural norms, it is important to recognize

images of the technological birth room on the Internet may be influential in dictating women's attitudes, choices and behaviour, before they enter the birth room.

## Keywords

Qualitative research; Discourse analysis; Image analysis; Visual messages; Birth environment; Internet

## Introduction

As we move into the digital age, society is undergoing a major shift in the landscape of communication (Kress 2000). The Internet and in particular the visual messages projected by images on the Internet have become powerful tools of persuasion, particularly in the field of public health reform (Bennett & Glasgow 2009; Houts et al. 2009; Mangold & Faulds 2009). Studies show visual images are an extremely effective way to convey highly complex and ideological concepts (Kress & van Leeuwen 2006; Lester 2014). Educational research too, has shown visual communication is a highly effective mode of communication. This is because people learn and retain up to 30% more information from visual stimuli such as photographs, television and film. This is in contrast with only 10% of what people read (Dale 1969; Stokes 2002). This occurs because words are processed by the short-term memory, while 'images go directly into the long-term memory where they are indelibly etched' (Burmark 2008, p. 5).

Recent research shows childbearing women are increasingly turning to the Internet to learn about childbirth (Lagan, Sinclair & Kernohan 2010; 2011). As a consequence it can be argued that the visual messages or discourse projected from images of the birth environment in print (magazines) and screen media (television, movies and the emergent landscape of the Internet) might be influencing birthing women, in that women will bring this implicit knowledge with them to their childbirth experience. With the rapid change in how society is educating and informing itself about lifestyle, health and leisure behaviours, by tapping into the Internet, it is important to understand the communicative messages being projected through images about childbirth and the birth environment. The purpose of this study therefore, was to analyse the messages and visual discourse being communicated through images of birth rooms in developed countries.

## Methods

Data were collected in 2013 from a variety of sources including Google Images (Google Inc. 2013), Flickr (Yahoo Inc. 2013), Wikimedia Commons (Wikimedia Foundation 2013) and midwifery colleagues. A diverse range of images was found by using the search terms hospital birth\* room\*, delivery room\*, birth unit design, maternity unit design, hospital labour ward birth\* space\* and childbirth. The search process resulted in 802,250,000 images from Google Images, 32,936 from Flickr and 588 from Wikimedia Commons, which were combined with 108 images obtained from midwifery colleagues in Australia, New Zealand, the UK and Germany.

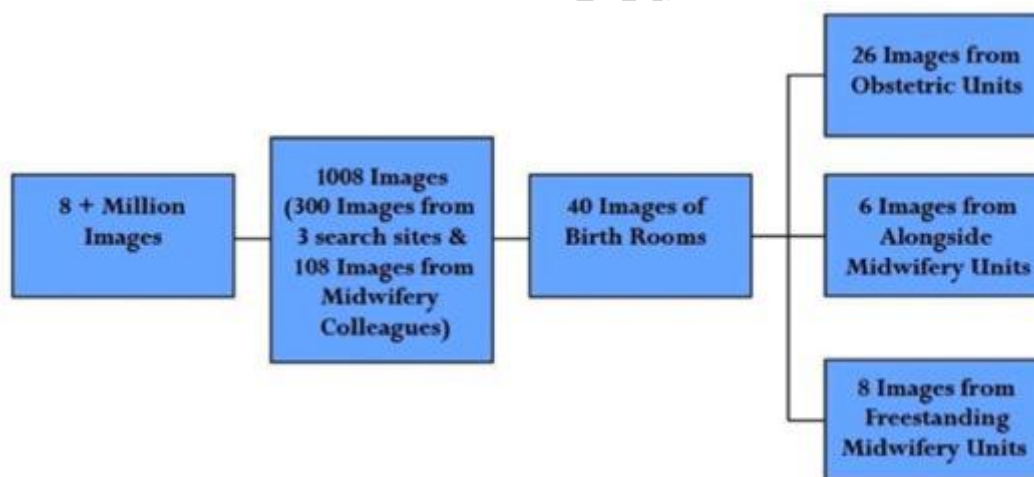
Due to the enormous size of available data (8 + million) initial efforts focused on reducing this number to a manageable size for analysis. Careful examination of the first 300 images from each of the three Internet search sites and the 108 images from colleagues (total 1008 images) was undertaken, with the aim of noting patterns and to list key ideas and recurrent themes. It was identified that the images were very similar in what they presented regardless of their source. The use of 1008 images was deemed far too many for this study, so a process of sample selection was decided upon which is described below. Purposive sampling and content analysis were used to select a subset of data that was seen to be a representative sample (Patton 2002).

As the aim of this study was to examine images of birth rooms from the developed world, purposive sampling was used to select images of birth rooms located in developed countries (Australia, Canada, Europe, New Zealand, United Kingdom and the United States of America) from:

- obstetric units (26 images)
- alongside midwifery units (6 images) and
- freestanding midwifery units (8 images).

These descriptors were drawn from the ‘Birthplace in England study’ (Rowe 2011) and are considered to cover the different kinds of maternity units available to childbearing women in the developed world.

Content analysis of the objects within the images and the configurations of the rooms was conducted until data saturation occurred at 40 images. Figure 1 shows the sample collection process.



**Fig 1:** Selection process to arrive at a heterogeneous sample.

This study used elements of Kress & van Leeuwen’s (2006) social semiotic theoretical framework for analyzing visual images. Kress and van Leeuwen’s framework organises visual language into three primary functions; *representational*, *interactive* and *compositional*. Key elements from each of these primary functions as well as *meaning potential* (van Leeuwen 2005, p. 285) were chosen to analyse the dataset.

### *The Analytic Framework*

Represented participants are the people, places and things that constitute the subject matter within the image (Kress and van Leeuwen 2006). *Representational meaning* identifies the relationship between the represented participants portrayed in the images. *Narrative* and *conceptual processes* are the two techniques used to identify what kinds of people, places, objects, events or activities are depicted. Narrative processes present unfolding actions and are usually identified by the presence of human or quasi-human figures. Conceptual processes, on the other hand, represent the participants in terms of their class, structure, or meaning (Kress & van Leeuwen 2006). Due to the lack of human or quasi-human figures this study focused on conceptual processes.

*Interactive meaning* is used to understand the way viewers engage and interact with images. In every reading of an image, the position or attitude of the viewer towards an image influences the way the message is 'read'. In this study, two aspects of interactional meaning were used and these were *contact* and *social distance*.

Contact is identified by the presence or absence of gaze/direct eye contact. Images where direct eye contact between the participant and viewer occurs is a 'demand' image, because the participant symbolically 'demands' the viewer enters into some kind of relationship. Alternatively, images that do not contain 'human or quasi-human participants' are called 'offer' images (Kress & van Leeuwen 2006). Images that make an 'offer', simply offer information or objects for contemplation (which can be accepted, or rejected).


In everyday interactions societal norms determine the distance we keep with people. Similarly, in images, social distance also influences how the viewer interacts with the image. For example, in a close up shot, where the object can almost be touched, read, used or eaten; the viewer is perceived to be intimately acquainted with the object, while a middle distance shot implies a social or familiar relationship. In contrast to these, a long shot where the object is positioned far away indicates a public, largely impersonal relationship. (Kress & van Leeuwen 2006).

*Compositional meaning* is used to analyse the way the images are composed or constructed. Compositional meaning relates to the way visual cues of the elements draw the attention of the viewer, and most importantly, the way "representational and interactive elements relate to each other and are integrated into a meaningful whole" (Kress & van Leeuwen 2006, p. 176). In this study, compositional meaning focused on *information value* and *salience*. Information value is influenced by the position of an element. Of particular importance to this study was foregrounding and centrality. Salience is the ability of an object to draw the attention of the viewer through specific visual cues such as foregrounding, size and colour. For example elements that are large in size, in the foreground of an image, made of a conspicuous colour or well illuminated, are seen to have greater 'weight' or 'gravitational pull' because of the way they draw the attention of the viewer. It is important to interpret which elements in an image have salience, because the most prominent objects, draw the viewer's attention, and influence the message and discourse of the image.

*Meaning potential* is used to identify ways visual communication conveys meaning. In Kress & van Leeuwen's framework there are two types of meaning potentials in images: meanings already introduced and universally recognisable in the elements represented in the images themselves (*meaning potential*), and those based on their functional uses (*affordances*). Along with the functional uses of the objects within the images, this analysis also explored the functional use of the Internet, a resource for information about childbirth.

### Analysis

Each of the 40 images was examined for visual attributes, following the process recommended by Kress and van Leeuwen (2006). An example of this is shown in Figure 2. Images with similar attributes were then grouped, while continuing to look for confirming and disconfirming evidence. This iterative process of reading the images continued until three types of birth room were identified. Analysis was undertaken by the first author with the support of the other two authors. Although the findings report each perspective in a linear fashion, it is important to remember that meanings derived from each perspective are communicated simultaneously, and interact with each other to construct and convey overall meaning.

Birth Room Image and Source	Image Analysis
 <p data-bbox="263 1355 670 1444">Image 18. ID: Aus4. Viewed 12<sup>th</sup> April 2012, &lt; <a href="http://www.fsh.health.wa.gov.au/For-patients-and-visitors/Maternity-tour#&gt;">http://www.fsh.health.wa.gov.au/For-patients-and-visitors/Maternity-tour#&gt;</a>. Source: Google Images. Aus = Australia.</p>	<p data-bbox="694 1070 1332 1097"><b>Representational Meaning</b></p> <p data-bbox="694 1097 1332 1164"><i>Observation:</i> There is no activity so this is a <i>Conceptual Process</i> because the image depicts the birth room, the objects and their spatial configuration.</p> <p data-bbox="694 1164 1332 1191"><b>Interactive Meaning</b></p> <p data-bbox="694 1191 1332 1243"><i>Contact:</i> Because there is no direct eye contact, this is an 'offer' image. The birth room is offered for the viewer's contemplation.</p> <p data-bbox="694 1243 1332 1294"><i>Social distance:</i> This is a long shot suggesting a public, largely impersonal relationship with the viewer.</p> <p data-bbox="694 1294 1332 1321"><b>Compositional Meaning</b></p> <p data-bbox="694 1321 1332 1373"><i>Information value:</i> The bed in the center of the image holds specific informational value because it draws the attention of the viewer.</p> <p data-bbox="694 1373 1332 1467"><i>Salience:</i> The large size, foregrounding and white colour of the bed linen make the bed the most salient feature in the room. Close proximity of the medical equipment to the bed (CTG machine and IV drip stands) gives them a degree of salience.</p> <p data-bbox="694 1467 1332 1494"><b>Meaning potential</b></p> <p data-bbox="694 1494 1332 1691"><i>Meaning potential:</i> The stark, cold-coloured, white, pale blue or green walls and floors, bright lighting, plastic or stainless steel material of the single electronically powered obstetric or standard hospital bed, CTG machine and neonatal resuscitaire, shiny smooth surfaces of the cupboard doors, counter tops and linoleum/vinyl floor are all surfaces that are easy to clean, and along with the uncrumpled white bed linen project a focus on the hygienic aspects of healthcare associated with hospitals.</p> <p data-bbox="694 1691 1332 1825"><i>Affordance:</i> The affordance of the bed is to lie down, medical equipment is for medical intervention, the shiny smooth linoleum floor are for easy cleaning and infection control, while the white walls and white bed linen give the image a clinical atmosphere. Other than the green feature wall, little attention has been given to aesthetics of the room.</p>

**Fig 2:** Example of image analysis using Kress and van Leeuwen's (2006) framework.

## Findings and Discussion

### *Representational meaning*

Representational meaning portrayed three types of analytical processes. Twenty-one (52.5%) images showed a spatial configuration where the birth room was 'bed centric'. In these images, the single, electronically powered, obstetric or standard hospital bed was shown to be the most prominent feature and focal point of the room. Its prominence was identified by its location in the foreground and center (or near center) of the image, and the position of numerous pieces of medical equipment and furniture beside the bed. In analytical processes, represented participants located in the foreground take precedence over other attributes and take on the role of persuasion. Thus the foregrounding of the bed persuades the viewer that it is important to birth and as such there is an expectation that a woman will use a bed during labour and birth. The positioning of the medical equipment near the bed reads that the medical equipment is important and is also a 'normal' adjunct to birth. The prominence of the medical equipment can also be viewed to suggest that birth is 'risky' and potentially will require medical assistance.

The properties of colour and surface texture also played an important role in terms of analysing representational meaning. The stark, cold-coloured, white, pale blue or green walls, bright lighting, plastic or stainless steel material of the single bed, CTG machine and neonatal resuscitator, shiny smooth surfaces of the cupboard doors, counter tops and linoleum/vinyl floor are all surfaces that are easy to clean, and along with the uncrumpled, white bed linen, project a focus on the hygienic aspects of healthcare associated with hospitals.

What these images therefore construe, is a technological birth space with a focus on the bed, medical equipment, the hygienic aspects of healthcare, and thus on medical functionality. These findings support those of Lepori (1994, p. 4), who argues that the organisation of the typical hospital birth room is a setting that displays the activities and 'patterns of movement that occur during a medical procedure', and as such, communicates that childbirth is a medical event, rather than a social event. A typical example is shown in Figure 3.



**Fig. 3:** Representational meaning shows the technological birth room places the bed in the center, which persuades the viewer it is important. The positioning of the medical equipment

nearby the bed persuades the viewer that they are also important. Source: Kelly Fowler, Australia.

In contrast to the majority of images, which portrayed the technological birth environment, 11 (27.5%) images represented a different kind of birth environment. In these images the bed and medical equipment were not positioned in the center and foreground of the image, and subsequently the viewer was not persuaded to believe that they were the focus and thus the most important aspect of the room. Instead, the images showed a double bed, bath and soft lighting, suggesting a less technological birth space. In contrast to the cold coloured walls in the more technological images, these images had relaxing warm coloured walls (red, raspberry pink, pale pink and orange), 'homelike' furniture and décor (wood grain cupboards, artwork on the walls, soft lighting, curtains around the window), coloured/wood grain floor surfaces, labour supports (birth stool/chair, mat, ball, fabric rope attached to the ceiling, wall mounted handrails), implied or actual views of nature from the windows and everyday objects such as a vase of flowers, plant, tray with cups and a teapot, and/or a television or radio. This construed a less technological birth space with a more relaxed, 'homelike' and less technological aesthetic, suggesting labour and birth is a more physiologically normal and active process. An example depicting some of these features is shown in Figure 4.



**Fig. 4:** Representational meaning shows the less technological birth room did not position the bed and medical equipment in the foreground. The viewer is not persuaded that they are important. Source: Google Images, United Kingdom.

Finally, analysis for representational meaning identified a third type of birth room. In 8 (20%) images attempts had been made to conceal the medical and technological focus of the room. The images showed 'homelike' decorative features including soft lighting, coloured bedspread, floral curtains, carefully designed wooden cabinetry/furniture, a wooden rocking chair and artwork on the walls. These reflected what has been described by Fannin (2003) as a 'hybrid' domesticated birth space, the 'homelike' birthing room within the hospital setting. Although such sociocultural constructions of the birth space could be seen to represent a fusion of the physiological and medicalised approach to childbirth, this was not so. Figure 3 demonstrates that without concealing the medical equipment the inclusion of the 'homelike' decorative trappings do little to diminish the medical equipment and the technological focus of the room. This is because the bed and medical equipment are positioned in the foreground and consequently the viewer is persuaded that these



features are the important aspects of the image/birth room. An example depicting some of these features is shown in Figure 5.



**Fig. 5:** Representational meaning shows in the ‘hybrid’ domesticated birth room the use of ‘homelike’ decorative trappings do not diminish the technological focus of the room. This is because the bed and medical equipment are in the foreground of the image, which persuades the viewer that they are important features of the birth room. Source: Google Images, United States of America.

#### *Interactive meaning*

Analysing for interactive meaning identified that 38 (95%) images made contact by an ‘offer’ of information because no human figure made direct eye contact with the viewer. In these ‘offer’ images, the birth room, the various objects, furniture and medical equipment and their spatial configuration were offered for the viewer’s contemplation. Such images did not require the viewer to react to anything, nor did they require the viewer to carry out a particular action or adopt a particular behaviour, instead they simply offered the viewer the opportunity to contemplate where birth takes place.

There were two types of ‘offers’ of information presented to the viewer. Most images showed a birth room that was bed centric, with numerous pieces of medical equipment, cold coloured walls and floor, thus suggesting that birth takes place in a technological environment. Such depictions of the birth environment ‘normalise’ the use of medical equipment and medical intervention, construing this type of birth room as the ‘norm’. The second type of offer of information presented to the viewer was of a ‘homelike’ birth environment with a bed, bath, matching furniture and décor, warm coloured walls and floors, and concealed medical equipment. Such depictions of the birth environment provoke a sense of comfort, relaxation and wellbeing, usually associated with the home.

To further explore interactive meaning, the images were also analysed for social distance. A close distance shot, which occurred in 13 (32.5%) images, where the bed and medical equipment were almost ‘touchable’, implied a personal and intimate relationship with the viewer. While a middle or long distance shot where the birth room participants were positioned further away suggested a public, largely impersonal relationship with the viewer. In this study, 22 (55%) images showed a medium distance shot. While not necessarily intimate, medium distance shots suggested a level of intimacy and familiarity between the viewer and the objects of the birth room. Thus

when viewers of the image find themselves positioned at a close distance to the bed and medical equipment they will feel a sense of intimacy. This reinforces that this setting is intimately related to them creating a sense of normality about giving birth in a medical, technological birth environment.

### *Compositional meaning*

In this study, analysis of information value identified the single electronically powered obstetric or standard hospital bed was positioned in the foreground and center of 30 (75%) images, making it the pivotal point of visual interest because of the way it held the image together and drew the attention of the viewer. This is because objects positioned in the foreground (closer to the viewer) are viewed as more important, while those in the background (far away from the viewer) are perceived as less important. In this study, 30 images (75%) showed the single or double bed in the foreground, which made the bed the most important element. Ten images (25%) showed the bed in the background, which made it less important. Examples depicting these features are shown in Figures 6a and 6b.



Figs. 6a and 6b. Compositional meaning shows the position of the bed influenced its importance. When in the foreground (Fig. 6a) it was more important. When positioned in the background (Fig. 6b) it was less important. Source: 6a Google Images, Canada; 6b Michael Sieger Designs, Germany.

Compositional analysis found the most salient element was the bed. This was because of its relatively large size when compared to other objects, its position in the foreground of the images, and the use of white bed linen, which greatly enhanced its visibility. This gave the bed prominence making the bed the most important feature of the room in the majority of images. This in turn gave the bed a 'charge', as if the eye were drawn to it like a magnet. Importantly, because the bed had such a 'charge', elements that overlapped or were nearby the bed were themselves also accorded a degree of salience. For example, when medical equipment, such as the CTG machine, neonatal resuscitaire, intravenous drip stand with electric pump, nitrous oxide and oxygen gas outlets and overhead surgical light fixture, were positioned close to the bed they were also given prominence. Suitable examples of this are shown in Figures 2, 3 and 6a. The salience of the medical equipment can be seen to reinforce the concept that childbirth is potentially 'risky' and that medical equipment that is readily available can make the place of birth 'safer'. Conversely, when pieces of medical equipment are positioned far from the bed they were not so prominent and therefore not so fundamental to birth. In some cases the equipment was completely concealed, giving it no prominence at all. Research has shown some women will find the medical equipment, such as a neonatal resuscitation trolley in full view, disturbing, while others may find it reassuring (Sheehy et al. 2011).

The only element found to diminish the salience of the bed was the birthing bath. This was because the bath was similar in size to the bed and was a conspicuous colour (white, blue or red). When it was positioned in the foreground (5 images, 12.5%) it was viewed as the most important element and when positioned in the background (8 images, 20%), it was perceived as less important. Examples of how the bath can reduce the salience of the bed are shown in Figures 4 and 5b.

### *Meaning potential*

To identify the meaning potential within the images of the birth rooms, each image was examined to ascertain the functional uses of the objects, furniture and medical equipment and the type of behaviour they would support. The meaning potential or visual cues of the bed, bright lighting, medical equipment (CTG machine, neonatal resuscitator, gas outlets, overhead surgical light fixture, intravenous drip stand and electronic pump) and hygiene-oriented features (white bed linen, hand-washing facility, smooth shiny textured walls and floor) informs us about the type of behaviour that women should display. Even if she wants to sit down, stand, or kneel on all fours, there is nothing in the visual landscape to suggest this is possible. Instead the visual cues suggest she will lie down, and assume a passive pose, allowing healthcare providers to watch and monitor her (Lepori, Foureur & Hastie 2008; Hammond, Foureur & Homer 2014; Hodnett et al. 2009; Townsend et al. 2014). The medical equipment that is presented as an intimate part of the childbirth process will also play a role. Again the visual discourse and narrative shown by this type of birth space is that it is 'normal' and 'safest' for childbirth to occur in a highly technological setting.

This is in line with some childbirth scholars who argue that in the developed world childbirth is predominantly defined as a dangerous medical condition best managed by medical professionals and medical intervention (Lupton 2012; Walsh, El-Nemer & Downe 2008). Instead of describing childbirth as a normal physiological process, it is portrayed as a process fraught with potential danger, with both the mother and baby at risk (Walsh, El-Nemer & Downe 2008). Consequently, it is argued that to meet the potential for danger, the process of childbirth should be carefully monitored and managed by medical professionals and medical equipment (Declercq et al. 2013a; Kennedy et al. 2010; Walsh, El-Nemer & Downe 2008). We argue that the images in this study reinforce this notion that the hospital with numerous pieces of technological equipment and 'expertise' is the most suitable environment to labour and birth (Davis & Walker 2010; Lupton 2012). Alternatively, it could also be argued that the meaning potential and affordance of the objects in the technological birth room images, offers reassurance that medical equipment is close by should the need arise to use it.

The meaning potential of the double bed and bath is that they are universally recognisable features of the home or hotel, which could be seen to project a sense of comfort, relaxation and wellbeing. The affordance and visual cue of the double bed is for women to be close to their birth partner or care provider, and the bath is for water immersion, relaxation and natural pain relief. While the birth stool/chair, bath, mat, fabric rope attached to ceiling and wall mounted handrail/bars are to facilitate movement and upright positioning, and the 'homelike' decorative features (wood grain cupboards, artwork on the walls, soft lighting, curtains around the window, flowers in a vase, a television or radio) create a warm 'homelike' aesthetic, suggesting there is an alternative to the technological birth room. The double bed, sofa, chairs

around a dining or lounge table, plants/flowers in a vase and teapot and cups on a tray, were seen to embody notions of domesticity and the naturalness of childbirth. Thus the less technological birth room images appeared to present childbirth as a physiological process, requiring little or no medical intervention because the medical equipment was not visible.

Finally, the quick, informal and repetitive way viewers can access and obtain visual images on the Internet could be seen to actively encourage a sense of intimacy. This occurs because the Internet actively puts the viewer in a 'temporal, if not geographical, co-presence' of the image producer (Kress 1998, p. 54) giving them a sense of connectedness with what is being portrayed (Kress 1998; 2010). Since people are continuously tapping into the Internet and viewing images, theoretically speaking, the continuous flow of images visually representing the technological birth paradigm becomes not just the opportunity for the viewer to view the narrative of the other, it also actively encourages/persuades the viewer to identify with and change their thoughts, values and behaviour (Dijck 2008; Fogg 2002). This reshapes the viewer's own reality; their self-narrative. The visual mode therefore can be seen to perform not only an epistemological role per se, but an embodied role, as viewers begin to shape their thoughts, values and behaviour, in relation to what they view. In summary, the images of the technological birth rooms on the Internet can inform, persuade, and motivate society, in particular women, about behaviours associated with childbirth trends and sociocultural norms.

### **Summary of Findings**

This study examined images of birth rooms in developed countries to analyse the messages and visual discourse being communicated. One of the limitations of this study is that it sourced images in hospitals and birth centres in developed countries. While it is acknowledged that birth occurs in other settings and in less developed countries, because of the large volume of images a decision was made to limit this study to images in hospitals and birth centres in developed countries where 97-99% of women will give birth in a hospital labour room (Li et al. 2013; Martin et al. 2013; Office of National Statistics 2013).

In this study, analysis identified three types of birth rooms; the technological, the 'homelike', and the hybrid domesticated birth room. The most dominant was the technological birth room, with the labour bed being the most salient feature. The relatively large size of the bed, when compared with other objects, furniture and interior design features persuades the viewer that the bed is important. The foregrounding of the bed greatly enhances its visibility and importance. The white bed linen on the bed was a further attribute that raised the visibility of the bed. Once the viewer had been persuaded of the importance of the bed, the co-location of the medical equipment nearby indicated that the medical equipment was linked to the bed. The visual messages embedded in the images of the technological birth space reads the bed as the most appropriate place to give birth and that the use of medical equipment is intrinsically involved in the birth process. Childbirth in this case is construed as risky/dangerous. Because the design and spatial configuration shown in photographs/images can be considered the blueprint for certain types of human activities and interactions (Kress & van Leeuwen 2001, p. 50), we argue that such

visual messages may deter women from choosing a low technological birth environment.

When positioned in the center and foreground of the birth room the one element that was able to diminish the importance of the bed was the bath. This is a significant finding, because the bath could be offered as an alternative to the bed, potentially transforming the cultural expectation for women to lie down on a bed during labour and birth. The concealing of the medical equipment further creates a more physiological birth space.

Given that the vast majority of the images contained a technological birth narrative that supports and promotes a medicalised approach to birth, it would seem that not only do changes need to be made to the design and spatial configuration of birth settings, attention needs to be given to the way the birth environment is visually represented. Promoting, supporting and protecting physiological birth is a focus that is high on the health promotion agenda in many countries (Brocklehurst et al. 2011; Declercq et al. 2013a; 2013b; National Health Service 2010; New South Wales Health 2010; Queensland Government 2012). Therefore, visual messages from images of less technological birth environments may go some way towards positively supporting childbearing women's attitudes, choices and behaviours towards physiological birth, before they even enter the birth room.

To verify these findings, we suggest further research could be undertaken that explores how women themselves read the messages contained in images of the birth room and how these might influence their attitudes and behaviour around childbirth. For now, midwives who understand that women could be entering childbirth already versed in the visual language of the technological birth room, refiguring elements of the birth space to communicate alternate visual messages might be more likely to promote physiological birth.

## **Acknowledgements**

This research was supported by an Australian Research Council Discovery grant, administered through the Birth Unit Design project at the University of Technology, Sydney. The authors have no conflict of interest to declare. Acknowledgment goes to Theo van Leeuwen for assistance in applying the framework and feedback on early drafts of analysis.

## **References**

Bennett, G.G. & Glasgow R. E. 2009. The delivery of public health interventions via the internet: Actualizing their potential, *Annual Review of Public Health* 30, 273-92.

Brocklehurst, P., Hardy, P., Hollowell, J., Linsell, L., Macfarlane, A., McCourt, C., Marlow, N., Miller, A., Newburn, M., Petrou, S., Puddicombe, D., Redshaw, M., Rowe, R, Sandall, J., Silvertown, L. & Stewart M. 2011. Perinatal and maternal outcomes by planned place of birth for healthy women with low risk pregnancies: the Birthplace in England national prospective cohort study, *British Medical Journal* 343, 1-13.

- Burmark L. 2008. Visual literacy: what you get is what you see. In: N. Frey & D. Fisher (Eds.), *Teaching visual literacy: Using comic books, graphic novels, anime, cartoons, and more to develop comprehension and thinking skills*, Corwin Press, Thousand Oaks, pp. 5-26.
- Dale, E. 1969. *Audiovisual methods in teaching*. New York, Dryden Press.
- Davis, D. & Walker, K. 2010. The corporeal, the social and space/place: Exploring intersections from a midwifery perspective in New Zealand, *Gender Place & Culture A Journal of Feminist Geography* 17, 377-391.
- Declercq, E. R., Sakala, C., Corry, M. P., Applebaum, S. & Herrlich, A. 2013a. *Listening to mothers 3: new mothers speak out*, Childbirth Connection, New York.
- Declercq, E. R., Sakala, C., Corry, M. P., Applebaum, S. & Herrlich, A. 2013b. *Listening to mothers 3: pregnancy and birth*, Childbirth Connection, New York.
- Dijk, J. V. 2008. Digital photography: Communication, identity, memory, *Visual Communication* 7, 57-76.
- Fogg, B. J. 2002. *Persuasive technology: Using computers to change the way we think and do*. Morgan Kaufmann Publishers, San Francisco.
- Google Inc. 2013, Google Images, viewed 12<sup>th</sup> April 2013, <<http://www.google.com.au/imghp>>
- Hammond, A., Foureur, M. & Homer, C. 2014, The hardware and software implications of hospital birth room design: a midwifery perspective, *Midwifery* 30 (7), 825-30.
- Hodnett, E.D., Stremmer, R., Weston, J.A. & McKeever, P. 2009, Re-conceptualizing the hospital labour room the PLACE (pregnant and labouring in an ambient clinical environment) pilot trial, *Birth* 36 (2), 159-166.
- Houts, P. S., Doak, C. C., Doak, L. G. & Loscalzo, M. J. 2006. The role of pictures in improving health communication: A review of research on attention, comprehension, recall, and adherence, *Patient Education & Counseling* 62, 173-190.
- Kennedy, H.P., Grant, J., Walton, C., Shaw-Battista, J., Sandall, J. 2010. Normalizing birth in England: a qualitative study, *Journal of Midwifery and Women's Health* 55, 262-269.
- Kress, G. 1998. Visual and verbal modes of representation in electronically mediated communication: the potential of new forms of text. In I. Snyder (ed.), *Taking literacy into the electronic era*. Oxon, Routledge, pp. 53-79.
- Kress, G. 2000. Multimodality: Challenges to thinking about language, *TESOL Quarterly* 34, 337-340.
- Kress, G. 2010. *Multimodality: a social semiotic approach to contemporary communication*. Routledge, Oxon.

Kress, G. & van Leeuwen, T. 2006. Reading images: the grammar of visual design. 2<sup>nd</sup> edn, Routledge, Oxon.

Lagan, B. M., Sinclair, M. & Kernohan, G. 2010. Internet use in pregnancy informs women's decision making: a web-based survey, *Birth* 37, 106-115.

Lagan, B. M., Sinclair, M. & Kernohan, G. 2011. What is the impact of the internet on decision-making in pregnancy? A global study, *Birth* 38, 336-345.

Lester, P. M. 2014. Visual communication: Images with messages. Wadsworth, Cengage Learning, Boston.

Lepori, B. 1994. Freedom of movement in birth places, *Children's Environments* 11, 81-87.

Lepori, B., Foureur, M., & Hastie, C. 2008. Mindbodyspirit architecture: creating birth space. In K. Fahy, M. Foureur & C. Hastie (Eds.), *Birth territory and midwifery guardianship*. Elsevier, Oxford, pp. 95-112.

Li, Z., Zeki, R., Hilder, L. Sullivan, E. A. 2013. Australia's mothers and babies 2011: perinatal statistics, series no. 28, Cat. No. PER 59, Australian Institute of Health & Wellbeing National Perinatal Epidemiology & Statistics Units, Canberra.

Lupton, D. 2012. *Medicine as culture*. 3<sup>rd</sup> ed, SAGE Publications, London.  
Mangold, W. G. & Faulds, D. J. 2009. Social media: The new hybrid element of the promotion mix, *Business Horizon* 52, 357-365.

Martin, J. A., Hamilton, B. E., Osterman, M. J. K., Curtin, S. C. & Mathews, T. J. 2013. Births: final data for 2012, *National Vital Statistics Reports* 62, 1-99.

National Health Service. 2010. Promoting normal birth – naturally: extract from literature review – high impact actions for nurse and midwives, National Health Service Institute for Innovation and Improvement, United Kingdom.

New South Wales Health. 2010. Maternity - towards normal birth, New South Wales Health Department, North Sydney.

Office of National Statistics. 2013. Births in England and Wales by characteristics of birth 2, 2011, United Kingdom Office for National Statistics.

Patton, M. Q. 2002. *Qualitative evaluation and research methods*. Sage publications, Thousand Oaks.

Queensland Government. 2012. *Queensland Maternal and Neonatal Clinical Guidelines - Normal Birth*, Queensland Government, Herston.

Rowe, R. 2011, Birthplace terms and definitions: consensus process. *Birthplace in*

England research program. Final report part 2: NIHR service delivery and organisation programme, Birthplace in England Collaborative Group, United Kingdom.

Sheehy, A., Foureur, M., Catling-Paull, C. & Homer, C. 2011, Examining the content validity of the birth unit spatial evaluation tool within a women-centred framework, *Journal of Midwifery & Women's Health*, 56, 5, 494-502.

Stokes, S. 2002. Visual literacy in teaching and learning: A literature perspective, *Electronic Journal of the Integration of Technology in Education* 1, 10-19.

Townsend, B., Fenwick, J., Thomson, V. & Foureur, M. 2015, The birth bed: A qualitative study on the views of midwives regarding the use of the bed in the birth space, *Women & Birth*, in press.

van Leeuwen, T. 2005. *Introducing social semiotics*. Routledge, Oxon.

Wikimedia Foundation 2013. Wikimedia Commons, viewed 12<sup>th</sup> April 2013, <[http://commons.wikimedia.org/wiki/Main\\_Page](http://commons.wikimedia.org/wiki/Main_Page)>

Yahoo Inc. 2013, Flickr, viewed 12<sup>th</sup> April 2013, <http://flickr.com/>

### Highlights

- Dominant images were of the technological birth room, which was 'bed centric'.
- The visual messages from the technological birth room reinforce the notion that the bed is the most appropriate place to give birth.
- Images of the technological birth room may be influential in dictating women's attitudes, choices and behaviour, before they enter the birth room.