Modes of knowing in simulated human pedagogies: The uncanny double of performance in nursing education

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Declaration

I declare that I have composed this thesis myself and that it embodies the results of my own research. Where appropriate, I have acknowledged the nature and extent of work carried out in collaboration with others included in the thesis.

Aileen V. Ireland

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Abstract

Computerised simulated human technologies are often considered to be the gold standard in clinical education, but calls to critically enhance the theoretical and philosophical foundation of this pedagogy have largely been left unanswered. The simulation learning literature is vast, but it is concerned mostly with measuring student outcomes and learning satisfaction, and little is known about how these technologies influence the practices of clinical educators or how professional practice learning is embodied in this complex, contentious, and uncanny space. This thesis explores the ways in which nurse educators enrol computerised simulated human patients into the assemblages within their pedagogical practices. Guided by the sensibilities of actor-network theory (ANT), and Mol's (2002) notion of praxiography, ethnographic observations were undertaken with nurse educators at two nursing schools. The educators wore digital videoglasses to record their teaching practices from their own visual perspective during the observations. In-depth interviews were held to further explore these practices while watching clips from the video recordings. The ANT sensibilities of allegory, translation, and multiple worlds guided a posthuman analysis of the assembled materials. The analysis revealed an understanding of the practices of simulation education as being doubly *performative*. The hybrid assemblages of simulation and educator tell stories that act on multiple levels; simultaneously specific and allegorical, theatrical and practice-focused. While oscillating deftly between the literal and the figurative, the educators make visible the invisible and elusive actants of nursing practice, including those often considered 'unteachable' in computerised simulation pedagogies, such as empathy, creativity, and compassion. These multiple layers of the uncanny are integral to the allegorical practices that must contend with the tension of teaching students to *pretend to be nurses* while they are learning to *become nurses*. While professing to enact 'scientific' and evidence-based approaches to teaching, the nurse educators' practices are inextricably bound with storytelling, indicating that the scientific and folkloric are not in binary opposition. Indeed, the research suggests that simulation education can be understood as a process in which both human and digital actants assemble to enact modes of knowing that are a composite of 'scientific' approaches and creative storytelling practices. Further, the thesis has refined the use of allegory in and beyond ANT-inspired approaches to conceptualise research in education and practice settings, particularly in considering the stories being told by all actants – human and non-human – and the allegorical modes of knowing they enact.

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Chapter 1: Introduction

A tale of two educators

> *At the heart of all science – its experiments, its theories, its mathematics, its discoveries, its interpretations – is the story instinct. The scientific mind would be impossible without the story DNA, without the story-seeing brain cells. The mind's aspects do not operate in isolation. Every human being immersed in the cyclorama of reality is implicated in the cosmic story-making nature of reality. Maybe this story-making quality of reality is what constitutes the heart of our existence.*
>
> From *The Mystery Feast*, by Ben Okri, 2015

This doctoral study arrived out of a coming together of two distinct and seemingly very discrete trajectories in my working life. By day, I worked in an administrative capacity in a very busy and energetic research centre, one devoted to the improvement of cancer and palliative nursing care, in the very demanding role of assistant to the director. By night, I donned an academic mantle and studied towards a part-time evening degree in English literature, with a strong emphasis on critical theory, and later, postcolonial critical theory. By day, my practices conformed to the rigid pressures of funding application deadlines, coordinating timely and multiple peer-reviewed ethics applications and final reports, paying excruciatingly pedantic attention to detail in the presentation of evidence in academic publications, and fastidiously accurate transcription of interviews with the people who would benefit most from the research – people affected by cancer and long-term ill health and those in need of palliative nursing care. By night, however, while maintaining the same academic rigour, I became something else completely; free from the 'hard' world of 'evidence-based practice', I was allowed to question and challenge research methodologies, to think critically about the way the world hangs together, and to unbridle my thinking in ways that my day job did not afford. My nurse educator/researcher colleagues often teased me, dismissing my critical theory approaches as being 'soft' and 'unscientific', but I

was intrigued by how it was the stories that the research participants told of their experiences of illness that held the most power in the many research project meeting discussions I documented – how the stories of their realities were implicated in mobilising the evidence to inform how nursing practice would hang together in the nurses' clinical realities. While these stories were heavily mediated by all the rigours demanded of the conventional reporting methods accepted in the academic nursing world, the mobilisation of this scientific knowledge would be impossible without the translation and distribution of these storytelling practices.

What I have since come to realise is that these two trajectories were not disparate parallel worlds, not two binary disciplines engaged in dialogue, nor two distinct identities – no Clark Kent to Superman, no Diana Prince to Wonder Woman.[1] Instead, when these two worlds came together, they did so not merely as a composite, nor as two sides of the same coin, but as a new entity; offering me a new way of looking at the world that was neither soft nor hard, but an assemblage of the two. My understanding of the world became more than the sum of its parts; it was "more than one but less than many", as Mol (2002, p. 82) might say. This coming together of two seemingly disparate worlds offered me, at the same time, a privileged and a peripheral position in the world of nursing research and education, and provoked in me a strong desire to explore how the stories of people, such as those who were living with long-term conditions, were translated into nursing practice, and furthermore, how they traversed between the multiple worlds of nursing research, education, and practice.

Before embarking on my doctoral scholarship, I had the good fortune of being given funding to complete a master's degree in educational research, an element of which provided me with an opportunity to perform a research placement in nursing education over a one-week period. Asking several of my colleagues to suggest how I might be able to observe nursing education in action, they invited me to attend their immediate life skills teaching sessions, as these were part of an intensive skills-based module provided to third-year nursing students at the end of their degree programme, and the entire third-year cohort were assessed on their immediate life skills over a one-week period. The observations that I made there, and the insights that I gained in performing

[1] In the original DC comic (1941), Diana Prince was Wonder Woman's alias while she worked as a secretary for the Justice Society of America (Marston, 1941).

that research, ignited my fascination with the stories of simulated human pedagogies and provided me with a very specific context within which I could explore how nursing education assembles with nursing practice to mobilise knowledge and allow these different worlds to hang together. This thesis tells the stories of two nurse educators, working in two separate nursing schools based in Scottish universities, and the practices they enrol as they navigate the uncanny world of simulated human pedagogies in performing the enactments of nursing practice education.

The spectres haunting nursing education

Storytelling is an uncanny activity. Bennett and Royle (1999) describe how the uncanny is particularly relevant to literary storytelling, as it "has to do with how the 'literary' and the 'real' can seem to merge into one another" (p. 37). Literature, they argue, is uncanny because it "makes the familiar strange, it challenges our beliefs and assumptions about the world, and about the nature of 'reality'" (p. 37). In nursing education, simulated human pedagogies are enrolled in telling stories to teach and to test students about the uncertainty of nursing practice, merging the fictional stories of the scenarios enacted there with the literal enactments of nursing practice they are designed to convey.

Teaching is also an uncanny activity. In his profound exploration of the uncanny, Royle (2003) describes how the uncanny involves "feelings of uncertainty, in particular regarding the reality of who one is and what is being experienced" (p. 1). In this sense, he argues, teaching always encompasses a sense of absence, made manifest by the presence and power of "past ghosts" that haunt "being-a-teacher" (p. 56) in the classroom:

> Who is speaking and to whom is one speaking when one teaches? … who is present and who is not: am I not, as a teacher, inseparable from those who have taught me? And does the classroom only contain those who are 'literally' present? Are there not mothers and fathers, friends and others, alive and dead, and even not yet born, known and unknown, also in the classroom? (Royle, 2003, p. 56)

Teaching always involves an uncanny doubling and return of the past; a conjuring up of the spirits of those who have gone before. However, Royle (2003) suggests that these

past ghosts are not to be feared. Instead, they serve to both disturb and affirm the very condition necessary for thinking about teaching and learning:

> There is no teaching without memory (however unconscious or cryptic) of the dead, without a logic of mourning that haunts or can always come back to haunt, without an encounter with questions of inheritance (Who or what is a teacher? Who or what has taught the teacher? How did this scene of teaching come about? Am I thinking my own thoughts? Where does a thought, an idea, a teaching begin?) (p. 53)

These ontological disturbances suggest a double, in that teaching encompasses a paradoxical suggestion of immortality (I am teaching, I can reproduce my knowledge and thereby live forever) and a herald of imminent death (in passing my knowledge to you, it no longer belongs to me and I therefore must die). Thus, teaching is uncanny because it conveys a radical disturbance of the familiar, making manifest these strange doubles.

However, if teaching itself is uncanny, teaching practical clinical skills with the use of computerised human simulation technology is doubly uncanny, because it involves (at least) two of the most prominent elements of the disturbing effects that the uncanny conveys:

> The uncanny involves, above all, strange kinds of repetition: repetition of a feeling, situation, event or character. Two obvious examples of the uncanny, in this respect, would be the experience of déjà vu (the sense that something has happened before), and the idea of the double (or *doppelgänger*). (Bennet & Royle, 1999, p. 37)

In simulation pedagogies in nursing education, the stories that are told are all based on repetition of a literary version of past events, in the form of typical clinical scenarios, and their telling is aided by the simulated human mannequin – the *doppelgänger* of the human patient. Thus, the educator must grapple with the uncanny nature of teaching while at the same time contend with the strangely familiar space of the simulated clinical setting *and* the cyborg double of the simulated human patient.

The uncanny University

Britzman (2007) describes a similar understanding of the uncanny nature of teaching by considering the great paradox within teacher education: how "newcomers learning to teach enter teacher education looking backward on their years of school experience and project it into the present" (p. 2), while teacher educators approach them as though they have no experience of schooling and thereby lack a past. Bayne (2010), in her insightful analysis of the uncanny in digital pedagogies, illustrates how the increased digitisation of higher education, in its "ontological blurring of being and not-being, presence and absence online" (p. 7), renders the University a disembodied ghost-like spectre, disrupting its material foundations to shift its positioning to the virtual and imagined. She argues how "[t]he university's online manifestations *become* the university. As a 'place [it] doesn't exist"' (p. 8). Entangled within this new becoming-digital space of the University is widespread use of simulation pedagogies. The same blurring of being and not-being (the simulation lab resembles a hospital ward, yet it is not quite a hospital ward) and presence and absence (patients, for example, are present in the simulated ward, embodied by the simulated humans, yet are at the same time absent) occurs in the simulation teaching spaces in University nursing schools.

It is widely assumed that simulating the human body is the safest and most effective starting point when teaching clinical students to care for "real patients" (Berragan, 2011, p. 663; Bligh & Bleakley, 2006, p. 607; Kneebone, 2005, p. 549), and this assumption has greatly contributed to the enrolment of simulated human pedagogies in nursing education programmes over the past century-and-a-half (Sanko, 2017). This positioning has informed the way in which clinical education programmes are delivered, and it is now taken for granted that all such programmes must include simulation as part of the practice-based element of the curriculum for all healthcare professions, including nursing (Berragan, 2011; International Nursing Association for Clinical Simulation and Learning (INACSL) Standards Committee, 2017; Jeffries, 2015; Nursing and Midwifery Council (NMC), 2018a). However, nursing education has not always resided within the academy.

Prior to the 1980s, nurse education was considered to be a vocational training programme resembling an apprenticeship. Trainee nurses worked alongside trained nurses who supervised their learning in the clinical setting, usually in one hospital ward,

practising their skills in a system of trial and error (Dingwall, Rafferty, & Webster, 1988). In 1985, the Royal College of Nursing (RCN, 1985), after raising concerns about the quality of nurse training in the UK, recommended a radical shift in the way in which nurses were prepared for qualification. This report ultimately supported an emerging proposal by the United Kingdom Central Council for Nursing Midwifery and Health Visiting (UKCC, 1986) to move nursing education from a practice-based vocational setting into a higher education setting. In addition, the programme was lengthened from two years to three, with more emphasis placed on classroom teaching for building a theoretical framework for nursing education, with the practice learning situated in multiple areas rather than remaining attached to individual clinical wards (UKCC, 1986). This migration of nursing education from the vocational setting to more "trans-disciplinary models of knowledge" (Young, 2008, p. 32) created a new hybrid of scientific and practical knowledges, designed to be organised in a collaborative way. However, this shift also disrupted the teaching and learning practices, effecting a similar disembodiment of the learning space as the shift to digital teaching has for the University, rendering it uncanny: "[i]n defamiliarising the familiar through creative pedagogical appropriation of the digital, teaching becomes newly, and productively, strange" (Bayne, 2010, p. 10). Royle (2003) writes how the University is "haunted not only by questions concerning the nature of teaching, but also by a sense of its relationship to itself and to its own past" (p. 54). This conceptualisation of the University is particularly significant in nursing education, where the University is not only a site of the digitisation of learning, but that, in attempting to realistically duplicate the material of nursing practice, it also renders strange the practices it attempts to teach within its own peculiarly disconnected home.

Despite repeated calls for more empirical research to examine the theoretical foundation of simulation as a teaching method (Berragan, 2011; Bleakley, Bligh, & Browne, 2011; Johnson, 2008), the literature is overwhelmingly concerned with the benefits of simulation in terms of patient safety (Beroz, 2017; Durham & Alden, 2008; Fey & Jenkins, 2015), student satisfaction with the learning experience (Cant & Cooper, 2017a), their improved confidence in practising psychomotor skills (Cant & Cooper, 2010), and their development of critical thinking skills (Cant & Cooper, 2017b). Very few studies have examined the use of simulation in nursing education from the educator's perspective, and these relate mostly to issues such as the standardisation of

best practice in simulation education (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014; White, 2017), while the issue relating to the pedagogical significance of simulation is almost completely ignored. For example, in their web-based survey of 62 nurse educators in the USA, Herrington and Schneidereith (2017) acknowledge that the educators face challenges in encompassing simulation in their teaching practices, but they do not define what they mean by 'simulation', and they focus instead on categorising the key concepts in the nursing curriculum for which the educators utilise simulation, and at what level of study.

Very little research has considered the implications of this increasing reliance on simulation technology for the nursing educators themselves, and how simulation might be influencing and shaping their own teaching practices. Furthermore, in aiming to develop a systematic and standardised 'best-practice guide' to employing simulation teaching methods, there seems to be a shift now to focus on the gap between the educators' technological skills and the integration of simulation within the nursing curriculum (Jeffries, Rodgers, & Adamson, 2015). This assumption reflects a position that completely disregards the very issue that simulation purports to address: "the gap between the theoretical knowledge and the practical application of nursing, most often expressed as a negative entity, with adverse consequences" (Greenway, Butt, & Walthall, 2019, p. 1), or, as it is otherwise known, the theory/practice gap.

Some researchers have explored the perceptions and experiences of nurse educators, however, these are isolated studies, and many are based in low-resource settings, such as Lesotho (Munangatire & Naidoo, 2017), where high-fidelity simulation is only just being introduced into the nursing education programme. A recent study (Press & Prytula, 2018) comprised a phenomenological analysis of interviews with nurse educators enrolled in high-fidelity simulation and found that those who advocate this pedagogy are sometimes marginalised and struggle to maintain their autonomy as educators, suggesting that there are more challenges in enrolling simulation in their teaching practices than simply the technological aspects. Some have attempted to address the challenges of nurse educators to incorporate high-fidelity simulation pedagogies into their practices; for example, Häggström et al. (2017) explored this aspect in focus group discussions with nurse educators. But these studies mostly began from the position that the educators "lack the specialized knowledge and techniques

required to educate students in simulation" (Herrington & Schneidereith, 2017, p. 204), and this suggests that it is not nursing practice that is being taught, or indeed learned, but *simulation*.

Initially, in developing the pedagogies to accommodate this radical reform in nursing education, the very teacher-centred, objectives-based 'Tylerian' model of learning was adopted (McLean, 1992), which prioritised the measurement of quantifiable outcomes designed to "legitimize nursing as a profession" and achieve "acceptable levels of competence for nursing practice" (p. 871). However, this quantification of nursing practice presented a tension between the traditional trial-and-error pedagogies and the folkloric storytelling creativity embodied in the "human science" (Bevis & Watson, 2000, p. 2) of nursing. Latterly, however, many nurse educators then engaged in a critical debate about the rigidity of the initial pedagogical models (Brown, Kirkpatrick, Mangum, & Avery, 2008; McLean, 1992). These authors acknowledged the limitations that such models impose, and instead proposed an understanding of teaching and learning as a process of co-construction of knowledge, suggesting that nurse educators should work to "liberate" the nursing curriculum from these "restrictive methodologies" (Bevis & Watson, 2000, p. 2) that continue to haunt nursing education. Because many of the pedagogical models enrolled in nursing education are assimilations of practices performed elsewhere, such as medical education, it might be argued that, in the insistence on adhering to rigid models that seek to reduce nursing pedagogies to measurable outcomes, some of the creativity embodied within the practice of caring has been lost.

More recently, and in the wake of several inquiries into the failure of care within the National Health Service (NHS) (Francis, 2013; Keogh, 2013), it has been suggested that these current pedagogical models are not appropriate for contemporary nursing practice, and an even more radical restructuring of nursing education is needed (Dyson, 2018). Building on this debate is a general assumption that advances in communication and learning technology demand a further paradigm shift in the way in which nursing is taught (Benner, 2012; Brown et al., 2008; Watson, 2017). Combined with this increased reliance on technology in nursing practice is the widespread advocating of computerised simulated human pedagogies to replace practice placement hours in

nursing education programmes (INACSL Standards Committee, 2019), which adds a further layer of complexity and amplifies a need to reconsider these teaching practices.

This thesis seeks to respond to this need to explore how these new pedagogies influence professional teaching practices by critically examining the ways in which nurse educators contend with the added complexity of enrolling computerised simulated humans. Shifting the focus of enquiry away from the quantification of student outcomes and experiences to focus on the practices of nurse educators, those who engage with these technologies to co-perform the mobilisation of knowledge, will allow a more critical understanding of how the educators negotiate these complex pedagogies. In the following sections, I shall explore some of the ways in which the entanglements of this technology with the practices of the nurse educators become powerful and establish durable relations that work to mobilise knowledge of nursing practice within its uncanny double of nursing education. In addition, I shall explore how professional standards and policies have contributed to the ways in which the educators must constantly design new and imaginative ways to negotiate these spaces. First, however, I shall introduce the concept of simulated human technology and describe how it has developed as a pedagogical tool in nursing education.

The uncanny automaton

> It is not only the teacher who becomes an automaton, but also the student, for he or she too is obliged to live up to the 'learning outcomes' set down in advance, in other words in a sense not to live at all, merely to 'receive delivery'. (Royle, 2003, p. 54)

Computerised simulated human patients are mannequins designed to simulate humans in clinical education learning. They are life-size replicas of the human body, mechanised to simulate physiological functions, such as breathing, blinking, sweating, and pulse, and other physiological indications, such as pupil dilation and hypoxia. They are wirelessly connected to computer software that can be used to program and modify such functions, alongside other clinical measurements, such as blood pressure readings, blood gas saturation levels, and heart rate. These software platforms can also be programmed to react to any interventions that students might introduce, for example, in response to how a student anaesthetist might be combining the anaesthetic agent with oxygen during the simulation of a patient under general anaesthetic. This type of

simulation pedagogy is often referred to in the literature as 'high-fidelity simulation', a term which is understood to signify "how closely a simulation experience reflects or mimics reality" (Lavoie & Clarke, 2017, p. 18). However, the term is not always used consistently (Cant & Cooper, 2010; Maran & Glavin, 2003; Tun, Alinier, Tang, & Kneebone, 2015) and does not only relate to the use of computerised simulated humans, but can also refer to the level of 'fidelity', or 'closeness to reality', that the simulation setting and scenarios are made (Ahn, Rimpiläinen, Theodorsson, Fenwick, & Abrandt Dahlgren, 2015). In addition, it can also refer to the psychological fidelity, or the "degree to which the trainee perceives the simulation to be authentic or real by 'suspension of disbelief'" (Kalaniti & Campbell, 2014, p. 43).

The uncanny uncertainty of reality

Recent technological advances have provided opportunities to further augment the highly technological features of these simulated human bodies in aiming to make them more 'realistic'. Some of these mannequins, such as Gaumard Scientific's (2018) Paediatric HAL, are now being manufactured with automated facial movements designed to simulate human emotional expressions in order to provide "a new level of interaction and richer patient-provider communication" to help learners to "assess verbal and non-verbal cues to build patient-provider communication skills and empathy" (Gaumard Scientific, 2018, n.p.). The underlying assumption seems to be that the more realistically that a human body can be replicated, the closer to nursing practice the student's experience will be when learning how to care and treat 'real' human bodies for future practice (Abelsson, Rystedt, Suserud, & Lindwall, 2014; Alinier, 2013; Ricketts, 2011; Weaver, 2011). However, these attempts to (re)produce the animated human form are also exemplars of the uncanny:

> The uncanny has to do with making things uncertain: it has to do with the sense that things are not as they have come to appear through habit and familiarity, that they may challenge all rationality and logic.
> (Bennett & Royle 1999, p. 37)

Paradoxically, the very act of attempting to replicate the familiar autonomous human form is precisely what troubles and disturbs this familiarity and embodies a sense of strangeness or eeriness in the mannequin, challenging the ability for students to encounter it as they would a human patient.

Automaton-centred care

Traditionally, the implications of employing this particular pedagogical tool are said to be of great benefit to learners in developing skills, competencies, and confidence (Hayden, et al., 2014; Kunst, Mitchell, & Johnston, 2016; Norman, 2012), critical thinking (Shin, Ma, Park, Ji, & Kim, 2015; Shinnick & Woo, 2013), and self-efficacy (Franklin & Lee, 2014; Weaver, 2011). These simulated clinical spaces, furnished with the same clinical materials and furnishings they would encounter in clinical practice, along with computerised simulated human patients, provide room for the students to break down procedural skills into components that can be safely practised on simulated humans without causing any harm to real people (Cant & Cooper, 2017a; Motola & Devine, 2013). In addition, the ability to repeat skills, interrupt tasks to pause and start again, and to be reflexive of these practices, are said to boost confidence (Najjar, Lyman, & Miehl, 2015; Nehring & Lashley, 2009), allowing students to go forth into practice with a greater sense of what to expect in the "real environment" (Moran, Wunderlich, & Rubbelke, 2018, p. 17) of a clinical setting.

In the past, learning clinical skills with simulation has been modelled on the tenets of experiential learning (Issenberg, Ringsted, Østergaard, & Dieckmann, 2011), and, in medical education, the method known as 'see one, do one, teach one' was also adopted in nursing education in learning to perform clinical skills by watching others and then practising these skills on real patients (Mason & Strike, 2003). More recently, however, concerns about patient safety have called this model into question (Albert & Burns, 2018; Kalaniti & Campbell, 2015; Wiesmann, 2018), and simulation techniques are often seen as one way to eliminate the risk of harming real patients by teaching what might be thought of as the "see one, practise many, do one" model instead (Sanko, 2017, p. 25). Moreover, this shift in focusing on patient safety aligns with the tenets set out in recent changes to how patient care is conceptualised in a movement towards the provision of 'person-centred care' (McCormack & McCance, 2016). Building on the body of earlier work proposed by McCormack and McCance (2006), the World Health Organization (WHO, 2015) defines person-centred care as:

> an approach to care that consciously adopts the perspectives of individuals, families and communities, and sees them as participants as well as beneficiaries of trusted health systems that respond to their

> needs and preferences in humane and holistic ways. People-centred care requires that people have the education and support they need to make decisions and participate in their own care. It is organized around the health needs and expectations of people rather than diseases. (p. 2)

Notably, this definition reminds us of Royle's (2003) conceptualising of the uncanniness of teaching – that it is the patient now, in a process of co-production of knowledge, who must be educated and, effectively, mobilise their knowledge of their own bodies outwards from their centre, towards the healthcare staff. This re-positioning of the patient enacts a fundamental shift in how knowledge practice, including nursing, is understood. This model thus raises issues in relation to how 'care' is performed and how learning to care for simulated humans might link to practising person-centred care on human beings.

Some educators (Ahn et al., 2015; Berragan, 2011; Bligh & Bleakley, 2006; Kaakinen & Arwood, 2009; Parker & Myrick, 2009; Schiavenato, 2009) are calling for a more critical assessment of the theoretical underpinnings that inform simulation as a pedagogic tool, urging a more in-depth debate around the purpose of simulation and its influence on medical education in general. Moreover, assumptions about the importance of replicating the human body to be as 'realistic' as possible are also being challenged (Ahn et al., 2015; Berragan, 2011; Bligh & Bleakley, 2006; Dieckmann & Krage, 2013; Dunnington, 2014; Johnson, 2008; Kaakinen & Arwood, 2009; Parker & Myrick, 2009; Schiavenato, 2009).

While the discourse around the wholesale immersion of computer technologies in teaching practice in general is not new (Bain & Weston, 2012), specific literature relating to nurse educators' digital fluency as it relates to their competencies in nursing practice is relatively jejune. In considering digital technologies in nursing education, the literature has focused mainly on e-learning and information communication technology (ICT) (Button, Harrington, & Belan, 2014), or to define and standardise simulation teaching protocols, and less emphasis has been placed on the pedagogical implications of computerised simulated humans in particular (Abrandt Dahlgren, Fenwick, & Hopwood, 2016). Some efforts have been made to address the professional development of nursing educators in using simulation (Jeffries et al., 2013). However,

most attempts to theorise computerised simulation pedagogies in nursing education are still centred on the learning experience rather than on the pedagogy itself, and these are concerned mainly with developing models and processes (Jeffries, 2015). The bulk of the research draws mainly on survey questionnaires, and very little empirical research has considered the experience of the educators and their perceptions of having to convey their own clinical knowledge within simulation learning. Moreover, they do not look to other forms of critique that have been debated more widely in the learning technology literature for decades.

As technology advances, the desire to endow the simulated human patient with a high level of "realism" (Ditzel, Hogarth, & Lesa, 2017, p. 120) has taken precedence. However, recent studies relating to the effectiveness of simulation found that, despite the higher "fidelity" of the mannequins, a sense of "realism" in the scenarios could not be established (Ditzel et al., 2017, p. 122). Some educators question whether the purpose of simulation should be to replicate clinical practice at all, suggesting that "[t]here is something about the complexity and the contingency of real life clinical practice that defies copying" (Kneebone, cited in an interview feature with Reynolds & Kong, 2010, p. 2). Moreover, those who advocate considering the importance of "realism" in simulation education report that, "to date, there's no compelling evidence that investing in the highest end of simulation equipment produces better outcomes" (Lavoie & Clarke, 2017, p. 17). Compounded within this issue is the recurring question; "What is being simulated?" (Hopwood, Rooney, Boud, & Kelly, 2016; Leigh & Tipton, 2014; Rooney, Hopwood, Boud, & Kelly, 2015), and Johnson's (2008) questioning of whose experiences of clinical practice are being enacted in the simulators, both of which remain unanswered. Despite these issues being raised over a decade ago (Bligh & Bleakley, 2006), there is still a lack of theory-driven, rigorous empirical research (Ahn et al., 2015) and a lack of critical discussion around the theoretical underpinnings of simulation pedagogies in healthcare education in general (Abrandt Dahlgren et al., 2016; Hopwood et al., 2016). Overall, the seductive nature of increasingly realistic technologies seems to fuel the assumption that these engineered replications of the human body act as the best pedagogical tools for teaching healthcare professionals to care for 'real' human beings. However, little is known about how nurse educators navigate the complex and unpredictable spaces of simulation learning, and

upon which theoretical bases they draw, to link the learning that is mobilised in these assemblages to practising in the real world.

The uncanny double of nursing practice

Bennett and Royle (1999) first proposed ten possible forms that the uncanny might take. Of these (as illustrated on p. 4 of this chapter), they suggest that "repetition is a key aspect of the uncanny" (p. 42), suggesting that the idea of the double (or *doppelgänger*) is the most prominent example of the uncanny. In this thesis, I find that this understanding of the uncanny is a particularly useful starting point in exploring the world of simulation in nursing education, as it provides multiple ways of recognising the disruptive uncanny practices that characterise simulation settings. The *doppelgänger* of the mannequin, replicating the human form, is at first the most obvious parallel. Most nursing students, and indeed many qualified healthcare professionals, who encounter the simulated human patient for the first time will experience the sense of unease that we recognise as the uncanny. In addition, the mannequin heightens this sense of unease, as the mannequin is perceived as being both human and merely mechanical at the same time. The uncanny emerges when "what is perceived as human is in fact mechanical" (Bennett & Royle, 1999, p. 38). This sense of unease is clearly evident when, for example, students first notice that the mannequin can blink or that the chest rises and falls with the breathing mechanism. However, it is also the inherent repetition embodied in the simulation scenarios themselves that serve to embody encounters with the uncanny – at the end of each scenario, whether the simulated patient has survived or has died, the mannequin can be re-set, enacting a form of haunting in that the patient may be laid to rest (either by dying or by having their health restored), but the ghost of past scenarios continue to be revived (either by coming back from the dead, or by repeating the same scenario of the deteriorating/restoring of health).

Bound up with these more obvious doubles in simulation education how the uncanny double is multiple – that the uncanny is not simply the strange, the creepy, the frightening, the undead, or the bizarre. Instead, the uncanny can be understood as a hugely valuable way of mobilising knowledge. In this thesis, I propose that the uncanny is a particularly powerful mode of knowing in simulation education, precisely because of the uncertainty and complexity that it brings to the teaching and learning assemblage. Not only are the strangely familiar practices of the simulated human

patient assemblage a powerful actant in simulation education, but the enactments of deception, or trickster storytelling, are also formidable modes of mobilising learning. In this thesis, I shall illustrate how the uncanny is integral to making these modes of knowing durable in the network. As Bennett and Royle (1999) suggest, the uncanny also involves "a kind of duplicity (both doubling and deception) within the familiar" (p. 42), and, ironically, it is this duplicity of simulation education that enriches it with the most powerful ways in which nursing practice knowledge is mobilised.

I also suggest that some of the uncanny practices particular to the settings of this thesis might be unique to the Scottish nursing education context. In the Scots language, the word 'uncanny' is considered to be the opposite of 'canny', which signifies "*unnatural* or *excessive* skilfulness, shrewdness or knowing" (Bennett & Royle, 1999, p. 42, emphasis in original), something that the nurse educators in this thesis seem to personify. In Chapters 4 to 6, their remarkable dexterity, both as educators and as performers, illustrates just how inextricable the uncanny is with their practices: how the simulated artefacts (the spaces, bodies, emotions, practices, and materials) in nursing education are enacted as the uncanny double of nursing practice in very canny ways, allowing their shrewd ways of knowing to be distributed and mobilised in this assemblage. To position Scottish nursing education within the wider context, what follows is an overview of the policies and standards that govern the use of simulation education within nursing education, internationally, and within the UK.

Professional standards and policy relating to simulation education worldwide and in the UK

In the UK, the Nursing and Midwifery Council (NMC) is the governing body for promoting standard practice for nurses, midwives and nursing assistants, including how they are educated. The NMC defines simulation as:

> An artificial representation of a real world practice scenario that supports student development and assessment through experiential learning with the opportunity for repetition, feedback, evaluation and reflection. Effective simulation facilitates patient safety by enhancing knowledge, behaviours and skills. (2018a, p. 93)

References to simulation in nursing education programmes vary worldwide, but, in nursing programmes in most Anglo-centric Global North countries, while simulation is advocated, the number of hours spent in high-fidelity simulation scenarios is not considered part of the requirements for clinical practice experience. In Australia, for example, the Australian Nursing and Midwifery Council (ANMC) recently conducted a review of nursing education standards and did not find "sufficient evidence to suggest that simulation should replace clinical practice" (ANMC, 2013, p. 21) in their programmes of study. However, the ANMC does endorse the inclusion of simulation learning activities "wherever possible" (p. 21). Similarly, in New Zealand, simulation cannot be used to count towards clinical practice hours. However, all students must have access to simulation learning experiences "to prepare them appropriately for clinical experiences to ensure the safety of health consumers, students, and staff" (Bogossian et al., 2018, p. 2). There seems to be a tension here between the great value that is placed on simulation as a method of teaching clinical skills, and how much confidence is placed in simulation to replicate the experience of clinical practice.

In the USA, the use of simulation in nursing education programmes varies between states, however, each programme is regulated by the National Council of State Boards for Nursing (NCSBN). In 2010, the NCSBN conducted a national survey (Hayden, 2010) to determine the prevalence of this new technology in nursing education, how nursing education schools were using this technology, and how educators were preparing to teach with this educational tool. This survey informed a large longitudinal, randomized controlled study to determine the effects on student outcomes when simulation was substituted for up to and including 50% of clinical practice experience (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014). In turn, this study informed the recent *NCSBN Simulation Guidelines for Prelicensure Nursing Education Programs* (NCSBN, 2016), concluding that the recommended number of hours of simulation that can be substituted for clinical practice is not the issue; it is the quality of the experience that should be considered. To set a guideline, however, the formal regulations state that nursing programmes are permitted to use simulation "as a substitute for traditional clinical experiences" (NCSBN, 2016), but these must not exceed 50% of the programme's requirement for total clinical hours. Conversely, in specialised post-qualifying nursing education programmes, such as those engaged in by

nurse practitioners, simulation cannot be used in lieu of clinical practice hours (Rutherford-Hemming, Nye, & Coram, 2016).

In the UK, in June, 2017, the NMC announced a "radical overhaul of nursing education" after conducting an eighteen-month consultation with healthcare professionals, patients and the general public to "share their views on proposals to help shape the future of nursing education" (NMC, 2017, n.p.). In developing the framework, the NMC described how they "considered issues such as student supervision and support, assessment in practice and the use of simulation" (2017, n.p.) in a bid to modify the standards. The aim was to: "reduce the variability of learning opportunities in practice and ensure a more consistent student experience that enables them to meet the requirements necessary for registration" (2017, n.p.).

In the education standards set by the NMC, each nursing programme must provide 2,300 hours of theory, and 2,300 hours of practice, and each approved education institution (AEI) has the flexibility to "determine the nature of theoretical learning" (NMC, 2010, p. 9). In addition, there are no specific requirements set in relation to "the nature or range of practice learning, other than that it must enable the competencies to be acquired" (NMC, 2010, p. 9). Importantly, however, since the 2010 standards for nursing education were set, approved higher education institutions for nursing education have been allowed to use simulation learning to account for a certain proportion of practice learning that was traditionally undertaken in clinical practice placement situations:

> Most practice learning is required to be undertaken in direct care of clients, although under certain criteria up to 300 hours of practice learning may be undertaken through simulation, allowing the student to learn or practise skills in a safe situation that imitates reality. (NMC, 2010, p. 9)

This permits nursing education programmes to allow for 13% of the total practice learning hours to take place in a simulated clinical space. Similarly, at that time in the USA, several states allowed up to 25% of practice learning time to be allocated to simulation learning (Jeffries, 2009). In the USA, the longitudinal, randomised controlled study conducted by the NCSBN (Hayden et al., 2014), designed to test the

effects of replacing practical clinical experience with varying levels of simulated clinical experience, found that there were no statistically significant differences between the control groups (those using 10% or less simulated clinical experience) and the intervention groups, which replaced clinical practice education hours with simulation education for up to either 25% or 50% of the total time. In response to these findings, the NCSBN developed national guidelines, which, first and foremost, advise that:

> Simulation is a pedagogy that may be integrated across the pre-licensure curriculum; however, nursing education programs are advised to begin slowly and steadily increase the amount of simulation as they acquire expertise in this pedagogy. (NCSBN, 2016, p. 6)

In citing the 'evidence' for this paramount assumption, the guidelines point to the *INACSL Standards of Best Practice: Simulation*^{SM} (INACSL Standards Committee, 2019), designed to "advance the science of simulation, share best practices, and provide evidence based guidelines for implementation and training" (INACSL Standards Committee, 2019, n.p.).

A similar move has been observed in other health professional training programmes. For example, in Australia, the professional regulatory body for occupational therapists allows up to 200 hours of the total 1,000 mandatory practice placement hours to take place in simulation learning (Imms et al., 2017). In a randomised controlled trial among physiotherapy students in Australian universities, Watson et al. (2012) found that those students who had experienced 25% of practice education in "simulated learning environments" had no worse attainment of professional competencies than those in the control group who worked with patients in clinical practice settings.

In the UK, the result of the NMC's consultation was published in May, 2018, with the new standards framework for nursing and midwifery education (NMC, 2018b) implemented from 28 January, 2019. The NMC (2018a) also acknowledged comments from its own Chief Executive and the Royal College of Nurses indicating that "Universities are best placed to decide how simulation should be used in learning" (p. 33). However, they also acknowledged that the majority of the respondents to the consultation believed that "there should continue to be a cap on hours spent learning in

simulation" (NMC, 2018a, p. 45). Here, this hierarchical distribution of the importance of simulation pedagogies in nursing education seem to create a paradoxical challenge for nurse educators, in that simulated human technologies are assumed to be important, but while the central regulating body advocates their application, it demands that educators are wary of it without any evidence of wider critical consideration of the issue.

When considering the challenges for nurse educators, most of the research refers to a very dated review (Miller, 1987), considering their lack of digital literacy and measuring their "comfort level" (Harder, Ross, & Paul, 2013, p. 1242; Jansen et al., 2009; Myrick, 2005) in engaging with the technology. Some make sweeping assumptions that the "generation gap" (Mangold, 2007, p. 21) contributes most to these challenges, often citing how the majority of nursing educators, because they are over 50 years of age, will not have had the same level of "exposure to technology" as their students, and that older educators will have "lived without computers and other advanced technology" (Harder et al., 2013, p. 1243). This assumption implies that younger, more technology-savvy educators will not face the same, or indeed any, challenges in adopting these pedagogies. This view, in part, is supported by some educators, who suggest that the way in which younger students learn has shifted along with the increased reliance on simulation technology, as suggested by Parker (2011), who notes the "preference of the millennial generation of learners for the immersive, realistic, and high-tech learning experiences that encourage social discourse and the creation of their own knowledge" (p. 2). Adopting this position, however, makes several underlying assumptions, including the idea that older people are incapable of engaging with new technologies and new ways of learning, which is blatantly ageist, discriminatory, and offensive (Joyce, Loe, & Diamond-Brown, 2015). Notably, many of these studies were conducted in settings where educators had access to fully equipped simulation centres, staffed with technicians to assist in operating the mannequins, and with a wealth of appropriate resources to rely on should the technology break down. In many of the nursing schools in Scotland, however, the educators themselves must perform each of the faculty roles at the same time – they are simultaneously technicians, 'confederates', performers, operators, and educators.

The absent other in the literature

Although repeated calls have been made to adequately prepare educators to employ simulated human patient technologies in their teaching practices, most of the research begins from the assumption that simulation improves patient safety, enhances student learning, and increases student confidence (Labrague, McEnroe-Petitte, Bowling, Nwafor, & Tsaras, 2019). In the trend to shift away from teacher-centred learning methods, the importance of the teacher in the teaching and learning assemblage seems to have been pushed to the periphery, marginalising any consideration of the nurse educator's enactments. This shift is mirrored in the literature, as the very limited amount of research that does consider the perspectives of the educator tends to focus on barriers to its use, and much of the research is now outdated, suggesting that the current teaching models are being widely accepted without additional critical consideration. With very few exceptions, the existing literature reports mostly on online surveys of nursing educators (Garner et al., 2018), and most of these explore their perceptions of barriers to enrolling simulated human patients in their practices (Al-Ghareeb & Cooper, 2016) with few qualitative studies exploring the role of educational theory in informing their practices in mobilising learning with this particular pedagogy. Those studies that do explore the practices of nursing educators also focus mainly on the debriefing sessions (Waznonis, 2015, 2016), without any consideration of the ways in which the educators and the technology are implicit in the mobilisation of knowledge prior to the debriefing taking place.

However, the research landscape is also shifting. Many researchers have heeded the call to consider the epistemological and ontological underpinnings of simulation pedagogies and have critically examined the widely accepted assumption that the replication of the hyperreal (Baudrillard, 1994) is the gold standard of clinical practice education. Notably, many have adopted a sociomaterial approach in their explorations of simulated human patients in clinical education. Hopwood (2017), for example, challenges the dominance of fidelity discourses by considering the enactments of the material-economic, cultural-discursive, and socio-political arrangements of simulation education practices. Ahn et al. (2015) consider performance and material arrangements and the emergence of learning in simulation-based training in medical education by drawing on ANT sensibilities. Nyström, Dahlberg, Edelbring, Hult and Abrandt Dahlgren (2016) explore the practice of debriefing in simulation education from a

sociomaterial perspective. Ahn and Rimpiläinen (2018) explore how the enactment of the patient during simulation training produces a particular reality that mobilises student learning in simulation education. Soffer (2015) enrolled a sensuous ethnographic method to explore how professional practices "are both embodied and transformed through social, material and affective engagements" (p. 11) in simulated human pedagogies. Abrandt Dahlgren et al. (2016) explore the concept of difficulty for learners in simulation pedagogies from a sociomaterial perspective to respond to the need for a more theoretical foundation for simulation education. These emerging understandings each enrol the unique techniques that sociomaterial research methodologies offer: a chance to explore the uncanny world of teaching by considering all of those *actants* that engage in the practices of mobilising knowledge in this uncanny, uncertain world of simulated human pedagogies.

Research questions

The absence of teachers and their teaching practices in the nursing simulation education literature seems to confirm what Royle (2003) proposes about the mechanization of teaching – that, despite the educator being an integral presence within the University, the increased power of technological ghosts, the strangely disembodied phantom of 'the centre', and the disturbing effects of such spectral authorities as the Research Excellence Framework, 'learning outcomes', and 'key performance indicators', renders the educator invisible (Bayne, 2010). Both present and absent at the same time, educators themselves are thus ghostly spectres haunting the University and the simulation education literature.

In recognising this marginalisation of the consideration of nurse educator's practices in the literature, and in understanding the merit and value that a sociomaterial exploration of these enactments would offer, I aimed to consider the following research questions:

1. How is the simulated clinical practice space being negotiated by the actants?
2. What teaching practices are being enacted in the space?
3. How are these teaching practices embodied by the actants?
4. What challenges or tensions emerge and how are these addressed?

Another way in which I acknowledge the absent other in this thesis was by adopting the term "actants" (Latour, 1987, p. 84) to describe the 'things' and their performances. An actant is an actor – it acts (Mol, 2010). However, it is also something more: something that, through a process of mediation, is caused to act, or causes something else to happen – "something that acts or to which activity is granted by others" (Latour, 1996, p. 375) – it *enacts*. So, in this thesis, by referring to the 'things', both human and non-human, as *actants*, I acknowledge their ability to act. In so doing, I attempt to overturn the "anthropocentricism and sociocentricism so strong in social sciences" (Latour, 1996, p. 375), being attuned to all of the actants to explore the sociomaterial engagements within a posthuman critical discourse.

The story of SimMan™

This is a tale of two educators. However, in the telling of their stories, I must also include the story of the simulated human – the mannequin. In each of the nursing schools I visited, the SimMan™ 3G mannequin was used in the simulation scenarios to enact the practices of a human patient (Figure 1). The story of the origins of the SimMan™ mannequin also tells a story about how the human and the non-human assemble to become a hybrid of the *more-than-human.* The SimMan™ mannequin is manufactured by Lærdal Medical, a company originally established in Norway by Åsmund S. Lærdal to publish children's books and manufacture toys. It was the company's expertise in designing soft plastics for toys that contributed to its shift to manufacturing mannequins that could be used to teach the cardio-pulmonary resuscitation (CPR) technique developed by James Elam and Peter Safar in the 1950s. Lærdal had a personal interest in developing the technique, having once saved his two-year-old son from drowning "by grabbing him from the water just in time and clearing the boy's airways" (Tjomsland & Baskett, 2002, p. 115). He then began combining his doll-making skills with making medical training aids to develop the first mannequins, having already manufactured "a series of very realistic imitation wounds" (Tjomsland & Baskett, 2002, p. 115) for the purposes of simulation in medical education. After presenting their new CPR technique at an anaesthetists' conference in Norway, Elan and Safar were introduced to Lærdal by Dr Bjørn Lind, and together they developed 'Resusci-Anne™', the "part-task trainer that was to revolutionise resuscitation training" (Bradley, 2006, p. 255). Resusci-Anne™ is the forerunner of SimMan™, and many of

the same basic mechanical principles encompassed in that early task-training mannequin are still used in SimMan™ mannequins today.

Figure 1: The SimMan™ 3G mannequin

Described by Lærdal Medical as "an easy to use advanced patient simulator",

> SimMan 3G can display neurological symptoms as well as physiological. It is designed to deliver the most realistic training possible whilst remaining easy to set up and simple to operate. (Lærdal Medical, 2018, n.p.)

SimMan™, then, from his humble beginnings as a doll, designed for "creating children's joy" (Lærdal Medical, 2018, n.p.), has transformed into a teaching tool for the purpose of "helping save lives" (Lærdal Medical, 2018, n.p.).

The simulation lab – the double of the clinical space

In the simulation lab, the mannequin is placed in a central position in the room, but it also occupies a pivotal position within this teaching and learning network; its presence embodies the object of the learning both figuratively and literally – the absent body of

the human patient. As such, however, the mannequin can be seen to embody reality out-there as well as reality in-here: it has presence in this space, but it also enacts the absent patient. In its dependence on being both present and absent, the mannequin is an enactment of a bundle of relations that generate *manifest absence* (Law, 2004, p. 14). Similarly, the educator is present in this space, however, this actant also embodies the absent enactments of nursing practice; acting as emissary to convey his own past nursing practices, and the imaginings of future nursing practices of the students, between spaces (Ireland, 2017). But the mannequin is implicit in allowing these imaginings to move and be distributed between these multiple material worlds. The mannequin, then, is an example of "presences enacted into being within practices" (Law, 2004, p. 84). However, in these enactments, the mannequin is also othered, because what is being brought to presence is also absence that is not made manifest (Law, 2004). The mannequin is present in enacting the practices of the human patient, but, by that very act, it is making itself absent. As Law (2004) suggests,

> method assemblage is the crafting of relations that shape, mediate and separate an object in-here, its relevant context out-there, and then an endless set of out-there relations, processes and all the rest that are a necessary part of the assemblage but at the same time have disappeared from it. (p. 84)

Law's understanding of method assemblage, then, suggests that the mannequin is at the same time present, absent, *and* enacting manifest absence, in "an endless oscillation between absence and presence" (Law & Mol, 2002, p. 18) in its embodiment of past/future nursing practices and the present simulated nursing practices. Because the mannequin "disturbs any straightforward sense of what is inside and what is outside" (Royle, 2003, p. 2), it is uncanny.

Attending to the task of tracing associations in the thesis

> *We write texts, we don't look through some window pane.*
>
> Latour, 2005, p. 122

It might be suggested that the uncanny within the practice of teaching nursing skills with computerised simulated humans is multiple: teaching itself is uncanny, the

simulated world of nursing practice is uncanny, it is situated in the uncanny University setting, and it occupies the uncanny space between the worlds of evidence-based practice and person-centred care that are centred on prioritised medical models of mobilising knowledge in clinical practice. In this thesis, I explore how the uncanniness of teaching might be important for thinking about the non-literary, and how, in particular, the practices of nurse educators might be doubly uncanny – and multiple. I intend to do so by attending to the multiplicity of simulation in nursing education by enrolling sociomaterial research methodologies in ways that serve to both highlight the importance of the educator as well as the importance of their co-producers of knowledge mobilisation in their practices: the simulated human technologies and the wider actor-networks that are entangled in the modes of knowing for nursing education.

This thesis is structured with the intention of telling an allegorical story: I present the stories of two educators while also signifying a much more philosophical tale about simulation pedagogies in general. In the next chapter, I shall introduce actor network theory (ANT), which informed the philosophical and theoretical background to my thesis and provided me with certain sensibilities that are particularly suited to this research and which address the call to further enrich the theoretical base for simulation pedagogies. First, I shall explore the beginnings of simulation in nursing education, and how it has shifted and transformed over the past 40 years. Next, I shall discuss three of the sensibilities offered by ANT that were enrolled to co-perform the research: allegory, translation, and multiple worlds. In the third chapter, I focus on the practical craftwork of gathering and organising the materials that allowed me to weave together the stories of the two nurse educators and their teaching practices. These stories are then told in three chapters that consider in more depth the performative in the practices, and in the materials encompassed in the world of simulation in nursing education (Chapters 4 to 6). In the seventh chapter, I consider the insights that have been gained in crafting these stories after taking them back to the educators and inviting them to participate in a pedagogical dialogue to further contribute to the conversations about how they negotiate the distribution and movement of knowledge within and between the worlds of nursing practice and education. Finally, the closing chapter offers reflections on the inferences that can be made from the insights presented in the thesis, and outlines the unique contribution that this thesis makes to the field of nursing education in particular, and professional education more widely.

Chapter 2

> *Stories are the koans that life sends us. They contain hints of multiple realities.*
>
> From *The Mystery Feast*, by Ben Okri, 2015

A story of actor network theory

Telling the story of actor network theory is a difficult task. Actor network theory (hereafter referred to as ANT) has been described as: an "analytic and methodological sensibility" (Michael, 2017, p. 2); "an approach to sociotechnical analysis" (Law, 1999, p. 157); a "heterogeneous web of relations" (Law, 2009, p. 144); "a ruthless application of *semiotics*" (Law, 1999, p. 3); "a sociology of scientific knowledge" (Michael, 2017, p. 14); a "theoretical cuckoo" (Law, 1999, p. 5); and as a "monster" of the Dr Frankenstein ilk (Latour, 1999a, p. 24). However, and somewhat counterintuitively, there is a consensus among its founders that ANT is not, nor was it ever, a theory (Callon, 1999). In this chapter, I shall tell the story of ANT, attempting to map out for the reader its beginnings, its displacement, evolution, and the ways in which it has provided the "material-semiotic tools, sensibilities, and methods of analysis" (Law, 2009, p. 141) to enact the research assemblage presented in this thesis. Within this mapping, I shall present and discuss the key terms that will be used in this thesis, providing a legend to the narrative so as to situate these ideas within my own conceptualisation of ANT. Finally, of the many material-semiotic sensibilities that ANT provides, I shall explore in more detail the three which have guided me in navigating the practices of nurse educators in simulation education: allegory, translation, and multiple worlds.

Sense and Sensibility

First, a word about the ANT notion of 'sensibilities'. As with much of the language of ANT, the terms are often loaded with double meanings, which cause elements of ambiguity, not least of which occur because of the linguistic translation of many of the original ideas from French to English. When Jane Austen published *Sense and*

Sensibility in 1811 (2003), in the title, and throughout the novel, she was playing with the dualist notions of either having 'good sense' (principles founded on reason or argument) or embracing the mid-eighteenth-century movement often referred to as the "culture of sensibility" (Barker-Benfield, 1996, p. xxvi) (principles founded on the reflection of sensory perceptions in the mind's consciousness). Brodey (1999) illustrates how these binary notions arose out of a new understanding that perceived the qualities of sensibility as a virtue by quoting the entry on "*Sensibilité (morale)*" from Diderot's (1775) *Encyclopédie*:

> Men of sensibility live more fully than others … Reflection can produce a man of probity: but sensibility is the mother of humanity, of generosity; it is at the service of merit, lends its support to the intellect, and is the moving spirit which animates belief. (Diderot, 1775, cited in Brodey, 1999, p. 111)

This eighteenth-century definition of sensibility might be outdated, but it represents a shift in philosophical thought that occurred in western thinking at the time, and the way in which Austen presents it, along with the echoes of its etymological beginnings, are still relevant to the usefulness of this term in describing ANT sensibilities. In philosophical terms, the term now signifies "the capacity for sensation and sense perception, as distinguished from the understanding" and also, "emotion, feeling, affectivity, as distinguished from the will" (Oxford English Dictionary (OED), 2019). While this dualistic conceptualisation at first seems to conflict with the principle of symmetry promoted by ANT, it is strongly associated with a revolutionary shift in understanding how knowledge is mobilised. In seeking to challenge the binary dualisms brought about by the divide between "things in themselves and the subject" (Latour, 1993, p. 57), Latour is influenced by the Enlightenment philosophy of Immanuel Kant, whose eighteenth-century ideas sought to overturn the commonly-held dualism between mind and body, insisting that human reason is central to the production of knowledge; that we can only experience reality by dint of the active concepts conceived in the human mind. As Latour (1987) writes, "instead of the mind of the scientists revolving around the things, Kant explains, the things are made to revolve around the mind" (p. 224). Thus, it is only the human capacity for sensibility, or "the quality of being readily and strongly affected by emotional or artistic influences

and experiences; emotional awareness; susceptibility or sensitivity to, keen awareness of" (OED, 2019), that allows us to experience reality in the first place. But Latour (1999b) contests this view, taking an even more radical position, describing this understanding as a catastrophic and "extravagant form of construction" (p. 5) that has since contaminated scientific study in its persistent reduction and categorisation of the 'truths' that generate knowledge of the realities 'out there'. Thus, in seeking to find one single form of reality, 'out there' and separate from the human in the centre, our human sensibilities are, ironically, what cause us to close down our understandings of the world in a reductionist way. With ANT, its sensibilities are not mere reductions; they combine both our capacity for perception with the acknowledgement that researchers are actively engaged in the reality that they attempt to describe. By paying close attention to the practices, or what Mol (2002) would call *enactments*, of scientific study, we can understand its many realities. As Callon (2006) suggests:

> We no longer have to choose between interpreting the world and transforming it. Our work, together with the actors, is to multiply possible worlds through collective experimentations and performations. (p. 53)

It is therefore the collective nature of ANT, in using these "performations" (Callon, 2006, p. 53) as a means to support our intellect, that allows us, as researchers, to employ the sensibilities afforded by ANT to develop a keen awareness of the relations in any given network. Being attuned to these relations, in turn, opens up possibilities to reveal these multiple realities. Such sensibilities are very useful when exploring the world of nursing as a profession and a field of learning, particularly because it must continually contest with persistent epistemologies that insist on perpetuating the authority of reductionist ideologies.

Material semiotics – a language with which the story of things might be told

Early Actor Network Theory

As the story goes, ANT began in Paris in the early 1980s at the Centre de Sociologie de l'Innovation of the École Nationale Supérieure des Mines de Paris (Fenwick & Edwards, 2010). The origin of the term, 'actor-network' (Callon, 1986a, 1986b) derives from Callon's (1986c) translation of his original French term, *acteur-réseau* (Dubois,

2017; Law, 1999; Mol, 2010), included in a note referring to the English edition of the same text. Law (2007) describes how ANT began as a response to the simplicity of the "large-scale claims" (p. 2) and broad grand narrative assumptions that prevailed in social theory, and suggests that its origin can be understood as a product of the intersection of the work that Callon (1986a, 1986b), Latour (1987), Woolgar (Latour & Woolgar, 1979), and Law (1987) developed at the time. Their aim, initially, was to develop a sociology of science and technology studies; a means of tracing and analysing the practices of the production of scientific knowledge to determine how the social intersected with the material to demonstrate 'objectivity'. Drawing on earlier work advocating a social constructivist analysis of science, or as it became known, the Sociology of Scientific Knowledge (SSK) (Barnes, 1977; Bloor, 1976), they soon realised that it was an understanding of the ways in which this knowledge was produced in practice that was lacking. While most often working separately, they each set about to challenge the assumption that the sciences are positioned so that they cannot be analysed culturally; the assumption that nature is 'out there' waiting to be transformed into knowledge, while society is 'up there' and can be understood by studying its structures in the same way that we might study the language of a text (Latour, 1996). Latour (1996) describes how this "semiotic turn" (p. 376) of the 1960s and '70s was a major contribution to thinking differently about the production of knowledge: in using the construction of language as a tool of analysis instead of simply a means of communication, "meaning productions became the only important thing to study" (p. 376). However, Latour, Woolgar, Callon, and Law were interested in the sociology of science and technology (STS), and, to those positioned within the paradigm of scientific knowledge, semiotics represented the opposite pole in understanding how knowledge is produced.

Before Latour and Woolgar (1979) first began to challenge these cloistered and binary notions of scientific modes of knowing, scientific knowledge, and the culture in which it circulated, had always occupied a remote and superior position, accessible only to the privileged few, persistent in being sequestered from the 'softer' knowledges of the social sciences or the arts. As Salk (1986) writes in the introduction to Latour and Woolgar's (1986) second edition of *Laboratory Life*, "scientists are not drawn to read what outsiders have to say about science and much prefer the views of scientists about scientific endeavours" (Salk, 1986, p. 11). Those who were interested in advancing

scientific knowledge by celebrating the rise of man over nature did so by engaging in a process of seeking to simplify the variables that operate in the natural world, prioritising rationality over the mystery of nature in reductionist ways to persuade others that the "solidity of the argument" (Latour & Woolgar, 1986, p. 238) presents the 'truth'. In contrast, the task of semiotic analysis in understanding meaning productions was to "recognize and relish their thick, rich, complex matter" (Latour, 1996, p. 376), thus making this understanding more dense, but at the same time, more obscure. Doing so, however, acknowledges the vast complexity of our world. As Law and Mol (2002) argue, we should approach any attempts to "order, divide, simplify, and exclude" (p. 2) with caution, as the act of simplification, by pushing complexity to the periphery, is actually a form of repression. Forgetting or ignoring complexity in a reductive simplification that attempts to "tame complex realities" (Law & Mol, 2002, p. 4) usually results in some form of violence. This is doubly wrong, they argue, as "violence is bad in itself, but it also fails to capture the intricacies of the way the world really is" (p. 4).

As an act of resistance in challenging these reductive ideologies, Latour and Woolgar (1979, 1986), Callon (1980), Callon and Latour (1981), and Callon and Law (1982) effected a radical shift in thinking about how scientific knowledge is produced. In particular, they acknowledged that knowledge production cannot be considered in isolation from all of the other complex network of 'actors' that assemble to mobilise learning about the world. This shift has enduring implications for all disciplines, but is particularly significant for the field of education, as it challenges the theoretical assumption that learning is primarily defined by the influences within individual and social/cultural parameters, independent of any material influences (Fenwick, Edwards & Sawchuk, 2011).

A bonfire of the dualisms

As Latour, Woolgar, Callon and Law then set about to examine STS, while drawing on such radical social methods as ethnomethodology (Garfinkel, 1984), they also resisted the trend in the study of the social to categorise and reduce. Instead of providing "an interpretation of what actors do simply glossed in a different more palatable and more universalist language" (Latour, 1999a, p. 21), their aim with ANT was to consider a semiotic analysis of STS in "an attempt to invent a vocabulary to deal with this new

situation" (Latour, 1996, p. 369). This was a radical move, as it located the *practices* of scientific knowledge within a 'text', challenging and resisting its position of priority within the perceived hierarchy of human knowledge. More importantly, attempting to position scientific knowledge itself as a text was a radical move, as it threatened to destabilise the founding assumptions of how scientific knowledge is produced while at the same time being informed by theoretical ideas that until then were totally disregarded, and even reviled, by scientists in general. As Callon (1987) writes, he introduced the idea of the actor-network to allow us to "measure the distance between the heterogeneous and 'impure' sociology of the engineers and the 'pure' and homogeneous sociology of the sociologists" (p. 98). In aiming to rupture these clear demarcations between the paradigms of scientific knowledge and the social construction of knowledge, they turned to the "slogans" (Latour, 1996, p. 376) of the semiotic turn. They disrupted the seemingly binary oppositions of nature/culture, knowledge/artefact, science/superstition, human/machine, mind/body, subjectivity/objectivity, self/other, undermining these well-established and taken-for-granted dualistic foundations to develop a more heterogeneous way of looking at the practices of STS. Arguably, they adopted a similar view to that embodied within Derrida's (1976) slogan: "*il n'y a pas de hors-texte*" (p. 158). There is no outside-text. The world is the text, and the text makes up the world; there is no truth 'outside'. Thus, instead of relegating the sociology of science to either one camp or the other, the designers of ANT proposed that materiality and sociality are inextricably intertwined and, as such, are heterogeneous (Law & Mol, 1995).

As Law (2009) describes, when Latour and Woolgar (1979) first began to explore the semiotics of these 'pure' scientific practices that claimed to seek the truth, he found instead that "in the laboratory most claims about the world are vague and promiscuously mix the social and the natural" (Law, 2009, p. 144). Latour and Woolgar (1979) suggested that the practices of knowledge production in science involved making certain choices about how nature is depicted in texts, obscuring the process of this 'truth-making' and hiding its messy relations. In marginalising this complexity, Law (2009) argues, "intermediate and heterogeneous relations of production are deleted to generate two quite distinct and separate domains: reality on the one hand and knowledge of reality on the other" (p. 144). Latour and Woolgar (1986) proposed instead that acknowledging the fundamentally social character of scientific knowledge

production provides a freedom to move between the boundaries of the realms of the "technical, the social, scientific, natural, and so on" (p. 279). This, Law (2009) suggests, reveals that it is "a system of purification that depends on a heterogeneous web of relations" (p. 144) that, when analysed with semiotic tools, can provide a way of looking at the world that draws attention to the effects of disregarding or marginalising these complexities. As such, "the sociology of science became a sociology of scientific knowledge" (Latour & Woolgar, 1986, p. 275). This introduced the idea that such knowledge production is instead a form of "material semiotics" (Law, 2007, p. 2), a concept which broke down the binary oppositions that supported the dominance of scientific knowledge over all others by effecting a 'reversal' of these assumptions. As Latour (1996) writes:

> As long as one studied fictions, myths, popular cultures, fashions, religions, political discourse, one could hold to the 'semiotic turn' and take them as so many 'texts'. Scholars did not seriously believe in them anyway and thus the intellectual distance and scepticism was easy to achieve while the double treasury of 'scientism' and 'socialism' was kept intact in their heart. But what about scientific truth and material efficiency? What about the reference 'out there' in hard scientific texts? This was the real test for semiotics and although it passed the trial a price had to be payed [*sic*]. In the practice of AT [ANT], semiotics was extended to define a completely empty frame that enabled to follow any assemblage of heterogeneous entities – including now the 'natural' entities of science and the 'material' entities of technology. (p. 377)

ANT thus began as what Law (1999) later described as "a ruthless application of *semiotics*" (p. 3). He explains how semiotics provided a means of including all of the entities within the text in its analysis without prioritising the social. It does this by disregarding long-established dichotomies and by granting equal importance to individual actors, collective agents, mundane objects, established practices, even invisible effects. Law (1999) explains how ANT:

> tells that entities take their form and acquire their attributes as a result of their relations with other entities. In this scheme of things entities

> have no inherent qualities: essentialist divisions are thrown on the bonfire of the dualisms. Truth and falsehood. Large and small. Agency and structure. Human and non-human. Before and after. Knowledge and power. Context and content. Materiality and sociality. Activity and passivity. In one way or another all of these divides have been rubbished in work undertaken in the name of actor-network theory. (p. 3)

In addition to breaking down these dyadic assumptions, ANT removes the distinctions between them; but, instead of dismissing these entities, ANT promotes the understanding of them as effects: "network effects, as subjects, objects, agency and actions are taken to emerge from the particular networks through which they co-emerge" (Fenwick & Edwards, 2010, p. 3). It is the coming together, the making of connections, of all of these entities within a network to enact, or perform, particular practices that brings the knowledge into being. Thus, drawing on ANT sensibilities is not only a means of conducting a radical semiotic analysis, but also a way in which the *performativity* of the material can be analysed. With ANT, "society and the social are not seen as a pre-existing object of enquiry, but as emerging through enactments of various forms of association, as network effects" (Fenwick & Edwards, 2010, p. 3).

Performativity

Drawing on a case study of a French strawberry market, Law (2007) provides an example of the semiotic approach to performativity. He explains how the idea of 'the market' cannot be understood as a 'state of nature' or a social construction, but that each effect within the strawberry market network assembles together to *perform* a set of practices that are particular to that market in that place at that time. Instead of being socially constructed, the market is enacted as a performance of material practices:

> In short, we are in the realm of performativity. Economics in theory is all very well, but economics in practice is different. And theory is only translated into practice if it is enacted – in practice … To understand markets we need to trace how the webs of heterogeneous material and social practices produce them. It is these that are performative, that generate realities. (Law, 2007, p. 12)

Because the theatrical understanding of *performance* is itself an *actant* in simulation education, it is very difficult to discern the boundaries between *performance-as-practice* and performativity (*performance of material practices*) in the sociomaterial sense. Callon (2002) provides an understanding of how performativity can be used as a "writing device" (p. 193) to mediate between the different actants and the assemblage as a whole. He proposes that the relations between the different actants can be seen as a narrative that allows the individual enactments to be compatible with their unity:

> Narrative mediation is situated in-between; it reveals both realities, individual and collective; and it does so by organizing the unexpected overflowing that, by renewing the action, reveals the existence of a story-already-there, which might have been concluded but which the actor opens and sets off again in an unexpected direction. (Callon, 2002, p. 200)

Thus, the performativity of the material practices, if understood as a narrative, provides a useful way of making visible those enactments that mediate individual performances to allow the simulation teaching and learning assemblage to hang together. However, in simulation education, the "writing device" can be considered a performance in and of itself, so herein lies a double.

> Performativity, then, is another crucial complexity-relevant trope. The argument is that knowing, the words of knowing, and texts do not describe a pre-existing world. They are rather a part of a practice (performing) of handling, of intervening in, the world of practice – enacting one of its versions – up to bringing it into being. (Law & Mol, 2002, p. 19)

Simulation education, as a "writing device" (Callon, 2002, p. 200), performs as part of the practice of nursing, but also is performative – it enacts a *version* of nursing practice to bring it into being.

This conceptualisation illustrates how ANT is useful for educational research – the semiotic approach reveals that material entities achieve their form "as a consequence of the relations in which they are located" (Law, 1999, p. 4), never simply by the ordering of 'things', but by closely examining how the material and the social are assembled. As

such, by tracing the materialities of enacting theory into practice, we can examine how this reality is "done and enacted rather than observed" (Mol, 1999, p. 77) – we can see how any theory is manipulated by how it relates to and mingles with, and how it affects, and is affected by, the various actors that it encounters as it engages in the performativity of the simulation education assemblage.

Heterogeneous engineering and translation

Significantly, and crucial to ANT, the knowledge produced within these assemblages of socio-material practices occurs in "a process of 'heterogeneous engineering' in which bits and pieces from the social, the technical, the conceptual and the textual are fitted together, and so converted (or 'translated') into a set of equally heterogeneous scientific products" (Law, 1992, p. 2). In ANT analyses, then, it is important to think of these assemblages as processes rather than as structures; that each of the actors and enactments are fluid and that "no version of the social order, no organisation, and no agent, is ever complete, autonomous and final" (Law, 1992, p. 5). The idea of a social order "with a single centre, or a single set of stable relations" (Law, 1992, p. 5) is rejected. Instead, in ANT analyses, it is accepted that there are multiple centres of power or order. Power effects are enacted in the network in a relational manner and are distributed widely across it, so analysing order, as a process, is important, but in ANT, power is seen to be "generated in a relational and distributed manner" (Law, 1992, p. 9). However, wherever there are centres of power, there are also resistances. An ANT analysis is concerned with understanding these multiple ebbs and flows of power and resistance. As Law (1992) explains:

> analysis of ordering struggle is central to actor-network theory. The object is to explore and describe local processes of patterning, social orchestration, ordering and resistance. In short, it is to explore the process that is often called translation which generates ordering effects such as devices, agents, institutions, or organisations. So 'translation' is a verb which implies transformation and the possibility of equivalence, the possibility that one thing (for example an actor) may stand for another (for instance a network). (p. 5)

Translation, then, relates to how actors are mobilised and juxtaposed in processes that "hold together the bits and pieces out of which they are composed" (Law, 1992, p. 5)

and how some are powerful and others resist, how some become durable while others dissolve. How some are hidden and taken-for-granted, while others stand out. For ANT, power is not seen as a set of causes, but as an effect; "it tells empirical stories about processes of translation" (Law, 1992, p. 5).

After Actor Network Theory

The architects of ANT have written extensively on the shift that occurred in its development during the 1990s, leading to what Law (2009) calls its subsequent "diasporic creativity" (p. 143), at a point in time often referred to as "actor network theory 1990" (Law, 2009, p. 142). As it has germinated, unfolded, and spread outwards, ANT seems to have developed an uncanny resemblance to much of the "heterogeneous engineering" (Law, 1987, p. 111) for which ANT is designed to reveal. Considering the development of ANT as a family of material-semiotic tools, it can also be seen as "a function of the interaction of heterogeneous elements as these are shaped and assimilated into a network" (Law, 1987, p. 113) in an assemblage that is entangled and overlaps with other intellectual traditions (Law, 2009). As such, if we consider ANT as an artefact, or an actor-network, it can also be seen as being an enactment of an assemblage of multiple relations. It has been shaped, and has resisted being shaped, by "the interrelation of a range of disparate elements of varying degrees of malleability" (Law, 1987, p. 113). In tracing its beginnings, Law (2007) emphasises that its origins are necessarily arbitrary and that any attempt to determine ANT's genesis contradicts its particular way of understanding a network. Instead, he argues, ANT "is itself a network that extends out in time and place" (Law, 2007, p. 3) and should be understood as a product of the intersection of multiple versions of the intellectual origins of ANT. As such, it is diasporic: "it has spread, and as it has spread it has translated itself into something new" (Law, 1999, p. 10). However, as Latour and others have repeatedly highlighted, ANT is not the dogmatic conceptual framework that it may appear by name. In several texts, Law (1999, 2007, 2011, and Law, Ruppert, & Savage, 2011, for example) tells the 'stories' of ANT, how its name betrays its essence, and how the architects of this heterogeneous engineering have had to defend this. Latour (1999a), too, responded by saying:

> I will start by saying that there are four things that do not work with actor-network theory; the word actor, the word network, the word theory and the hyphen! Four nails in the coffin. (p. 15)

Despite this seemingly morbid diagnosis of ANT, Latour's (1999a) response provides a full analysis of the processes relating to each element that have contributed to ANT's mythical status and misunderstandings. He tends to each of these elements in turn, and each is related in some way to semiotics. In acknowledging that the label, "Actor-Network Theory" (Latour, 1999a, p. 15) is a misnomer, he points out, ironically, how it is its language that has contributed to most of its misunderstandings. First, the translation of the notion of 'network' from French to English is partly to blame. Latour (1996) also explains how Callon (1986c) first adopted the word "*réseau*" to signify "the network". He did so by drawing on Diderot's work to describe matter and bodies "in order to avoid the Cartesian divide between matter and spirit" (Latour, 1996, p. 371). This deliberately proposed a move away from the hegemonic dualist ideologies found within the persisting natural/cultural, agency/structure debate within social theory, and thus was suitably appropriate in the original intentions of ANT. In French, the word "*réseau*" is more closely associated with the idea of a system of rivers or roads. Furthermore, when paired with *d'intrigues*, the term signifies a 'web of intrigue', a term more akin to a network assemblage. This conceptualisation of a network is aligned closely with Deleuze and Guattari's (2004) idea of "rhizomatic" structures (p. 3), or the idea that the complexities of life can never be composed of closed systems. Rather, and similar to systems of plants, such as bulbs or mosses, life operates in a non-hierarchical manner and each individual organism acts by responding to other shifting systems, for example, other organisms, or the environment (Colebrook, 2002).

Unfortunately, however, the term's English equivalent, 'network', then began to take on its own creative diaspora, and its meaning, evolving over time, became reversed. Instead of denoting "a series of *transformations* – translations, transductions" (Latour, 1999a, p. 15), it came to signify the exact opposite of what was originally intended: "transport *without* deformation, an instantaneous, unmediated access to every piece of information" (Latour, 1999a, p. 15). Similarly, the word 'network' is problematic because, at its introduction, those objects described by ANT were "networks in the technical sense" (Latour, 2005, p. 131), and the now-ubiquitous understanding of the

internet or the networked human had not yet appeared on the horizon. Much of the 'after ANT' intellectual work has had to wrestle with promoting a shift to the more fluid understanding of a 'network', in its English sense, as being more rhizomatic in nature and thus less rigid. In doing so, those who first promoted ANT (see, for example, Law, 2009; and Mol, 2010) have turned away from using the term entirely. This ambiguity around the use of the word 'network', and the shift away from the term itself, proved to be important in my analysis and in the enactments of my own modes of knowing as a doctoral researcher.

The second term Latour (1999a) addresses in his response is 'actor', particularly in its assemblage with the word 'network', and how it is connected by the hyphen. He describes how he objected to the hyphen "from day one" (p. 16) because it is an unfortunate reminder to social theorists of the binary oppositions of agency/structure that ANT aimed to resist. He argues that "most of the misunderstandings about ANT have come from this coupling of terms" (1999a, p. 16). He cites one example where the critique assumes that morality and humanity are absent in ANT because humans are not prioritised over 'things', effecting a "dissolution of humanity" or "the death of Man" (1999a, p. 16). However, this is a grave misunderstanding of the purpose of adopting this idea of *symmetry*, the geometric metaphor for which Latour (2005) also felt compelled to later abandon:

> ANT is not, I repeat, not the establishment of some absurd symmetry between humans and non-humans. To be symmetric, for us, simply means *not* to impose a priori some spurious asymmetry among human intentional action and a material world of causal relations. (p. 76)

By prioritising neither the enactments of humans nor non-humans, ANT allows an analysis of how everyday things assemble together with humans to "form associations or networks that can keep expanding to extend across broad spaces, long distances or time periods" (Fenwick & Edwards, 2010, p. 3). Instead of focusing on only the humans, it considers the "minute negotiations" (Fenwick & Edwards, 2010, p. 4) that occur at the point of intersection between all things. Therefore, ANT draws attention to how knowledge is mobilised through these assemblages.

Fenwick and Edwards (2010) point out the importance of this understanding to research in education, proposing that ANT analyses, by highlighting the importance of materiality in educational endeavours, and the importance of "the intimate associations between objects and all human attributes, capacities and activities" (p. 4), demonstrate how learning is not merely a cognitive process internalised by the (human) individual, but that "learning itself becomes enacted as a network effect" (p. 4). In this way, and similar to the idea of the rhizomatic system proposed by Deleuze and Guattari (2004), the production of knowledge is not enacted in isolation from other processes and effects in the network. Instead, these relations can be understood as a heterogeneous series of assemblages, each actor relying on the other to mobilise knowledge, or, as Mol (2010) suggests, in a similar way to language:

> In De Saussure's version of semiotics, words do not point directly to a referent, but form part of a network of words. They acquire their meaning relationally, through their similarities with and differences from other words … In ANT this semiotic understanding of relatedness has been shifted on from language to the rest of reality. (p. 257)

Thus, the 'actors' in any given network are given the ability to act by their relatedness to the other 'actors' around them. They cannot be analysed in isolation; only in their relation to others. This means that within each new analysis, the meaning of what an 'actor' might be will shift. In addition, because the actors are in constant tension and motion, it is not possible to quantify or count to distil the analysis. Instead, Mol (2010) suggests, "the point is not to purify the repertoire, but to enrich it. To add layers and possibilities" (p. 257). Rather than reducing the complexity of the relations in seeking clarity, an ANT analysis seeks to celebrate the messiness of these networks. It does so by acknowledging the inherent agility of the actors, and even in how we recognise them, writing how:

> it is not possible to pin down exactly what an 'actor' is made to be in 'ANT'. ANT does not define the term 'actor'. Instead it plays with it. In that sense, then, ANT is not a theory: there is no coherence to it. No overall scheme, no stable grid, that becomes more and more solid as it gets more and more refined. The art is rather to move – to

> generate, to transform, to translate. To enrich. And to betray. (Mol, 2010, p. 257)

This leads us to the third problematic term that Latour addresses: the word 'theory'. He cites Lynch (1995), who suggested ANT should instead be called "actant-rhizome ontology" (p. 169), but admits the term lacks elegance. Latour (1999a) explains:

> It was never a theory of what the social is made of, contrary to the reading of many sociologists who believed it was one more school trying to explain the behaviour of social factors. For us, ANT was simply another way of being faithful to the insights of ethnomethodology: actors know what they do and we have to learn from them not only what they do, but how and why they do it. It is *us*, the social scientists, who lack knowledge of what they do, and not *they* who are missing the explanation of why they are unwittingly manipulated by forces exterior to themselves and known to the social scientist's powerful gaze and methods. (pp. 19–20, emphasis in original)

Here Latour (1999a) places responsibility squarely on the enactment of practices to illuminate our understandings of the world, not on the world itself to construct them for us. Instead of adopting a theory to look for a consistent perspective, ANT does not offer a theoretical framework on which to hang our 'findings' about the world. As Mol (2010) points out, "It is impossible to 'use ANT' as if it were a microscope" (p. 261) because it does not support a consistent perspective. Quite the opposite, as Mol (2010) explains:

> ANT is not a theory, says Callon. This is true in various ways. For a start, ANT writings do not offer something that remotely resembles a 'law of nature' – or, given that typically the social and the physical are studied together in ANT work, a 'law of nature-culture'. (p. 261)

The tracing of effects is a particularly useful tool in education research. Because ANT allows us to explore the effects of the assemblage of education as a "network of practices", it recognises both the "materiality and materializing processes that are central to understanding learning and teaching" (Fenwick et al., 2011, p. 95). This, in

turn, allows us to trace the actors through the system, from policy, to curriculum to classroom, to understand how these effects become powerful and durable by linking with other actors.

The death of ANT?

So, at the intersection of ANT and after ANT, was there hope for ANT? Latour (1999a), employing the technique of allegory, and in keeping with his coffin analogy, proposes the Death of ANT. Likening ANT to the vampire, he suggests a solution to the problem might be to "drive a stake into the heart of the creature safely buried in its coffin", but also suggests that ANT might be more like Frankenstein's monster than Dracula. "The only solution", he writes, "is to do what Victor Frankenstein did not do, that is, not to abandon the creature to its fate but continue all the way in developing its strange potential" (1999a, p. 24), as the grandson of Victor von Frankenstein does in *Young Frankenstein* (Brooks & Gruskoff, 1974). By burying the term, Latour (1999a) implies, ANT can be revived as "some other creature" to "emerge, light and beautiful" (p. 24) to leave the murky misunderstandings of 'actor', 'network', 'theory' and the 'hyphen' dead and buried.

In producing this critical account of ANT, Latour is again going back to the semiotic roots of ANT and enacting a process that reminds us of the works of Barthes (1968/2001):

> Classic criticism has never paid any attention to the reader; for it, the writer is the only person in literature. We are now beginning to let ourselves be fooled no longer by the arrogant antiphrastical recriminations of good society in favour of the very thing it sets aside, ignores, smothers, or destroys; we know that to give writing its future, it is necessary to overthrow the myth: the birth of the reader must be at the cost of the death of the Author. (pp. 1469–1470)

In the same way that Barthes (1968/2001) proposed a reversal of the priority that is placed on the writer, ANT promotes a reversal of the prioritising of the human and the social. The myth of the power of materials is overthrown, and the very 'things' that had previously been ignored or set aside can now be considered equally. Law (1999) writes how "easy use of the term 'actor-network' has tended to defuse the power and the

tension originally and oxymoronically built into the expression" (p. 8). However, despite, or perhaps because of, these caveats and self-deprecating warnings, ANT seems to persist as a highly useful and critical method of looking at the world that resists the reinforcement of the myth that the social can be considered in isolation from the material. Fittingly, now that we have arrived at the Death of ANT, I shall now describe how its sensibilities breathed life into my research.

Fluid sensibilities – going with the flow

As my research observations began, I was intrigued by the nurse educators' abilities as storytellers. However, I first found it difficult to avoid foregrounding the human actants in my observations. This led me to become interested in the ANT sensibility of allegory. As Law (2004) observes, "allegory flourishes as an art form in contexts where there is explicit repression" (p. 88), illustrating how agency is often hidden in direct representation. He notes that those in power attempt to present their statements as "literal descriptions of a single reality" (Law, 204, p. 89), but that we are all experts in identifying and interpreting these representations cynically and with scepticism. Thus, by understanding allegory as a means of uncovering hidden power, this sensibility provided me with a tool with which I could continually look for the "silent implements" (Latour, 2005, p. 81) that were also enacting allegorically within the scenarios. Next, as I became attuned to how forceful certain effects became in the teaching and learning assemblage, I realised that each of these heterogeneous effects performed as a "centre of translation" (Law, 1994, p. 138) – that all of these storytelling effects, drawn from different points in space and time, became transported to the scenarios, merging together within a single space (Latour, 1990) to enact the mobilisation of knowledge. Finally, in becoming attuned to these centres of translation, I also realised that each of these effects was related to the other in different ways. As Law and Mol (2002) observe, the various "orderings" of the effects did not always tell the same stories, nor did they "impose the same silences" (p. 7). Instead, they were translated in multiple ways. In understanding the storytelling effects as being multiple, this allowed me to overturn the assumption that "successful translation generates a single coordinated network and a single coherent reality" (Law, 2009, p. 152). As Mol (2002) suggests, I was able to see how the different ways in which these effects related to each other worked to create modes of knowing that were multiple – that these performances and

translations of allegorical storytelling were engaged in practices that enacted multiple realities.

Latour (2008) advocates adopting a more fluid approach to understanding the world – to "follow the actors" (Latour, 2005, p. 12) and to "go with the flow" (Latour, 2008, p. 13) to learn from them how an assemblage hangs together. In choosing which ANT sensibilities worked best for the simulation education assemblage, I found that each choice linked with the next, and each one was connected with the other rhizomatically. Thus, as Latour (2008) advises, I aimed to become a researcher who "moves side-way [*sic*], does not try to bridge some imaginary gap between a symbolic order – that of humans – and the material world out there" (p. 5).

Allegory as a method of making things visible

As a rhetorical device, allegory is used as a means by which to convey a particular message hidden within the text. A text can take the form of writing, images, music, or theatre. In literary terms;

> Allegory is a narrative, whether in prose or verse, in which the agents and actions, and sometimes the settings as well, are contrived by the author to make coherent sense on the "literal," or primary, level of signification, and at the same time to signify a second, correlated order of signification. (Abrams, 1999, p. 5)

Here, the term 'rhetorical' refers to "the means and devices that an orator uses in order to achieve the intellectual and emotional effects on an audience that will persuade them to accede to the orator's point of view" (Abrams, 1999, p. 268). In its simplest form, allegory is a story – a fiction – but one that is firmly grounded in reality. It is a story that uses characters, settings, and a plot that the audience will believe could happen, rather than presenting fantastic, imaginary beings situated in strange and implausible settings. However, in allegorical stories, these plausible fictions always signify a deeper but more important meaning – one that is hidden and is only revealed in the act of telling the story. When enrolled by talented storytellers, allegory can be used to both reveal a hidden message to the audience and, at the same time, to hide radical critique of a dangerous or forbidden topic of discussion. Allegory, then, can be seen as a means of

enacting a critical discourse by *persuading* its audience to believe or behave in a certain way.

Allegory always relates to the literal, but at the same time has a second, sometimes more significant, double:

> In its most common usage, [allegory] refers to two related procedures, a manner of composing and a method of interpreting. To compose allegorically is usually understood as writing with a double meaning: what appears on the surface and another meaning to which the apparent sense points. (Copeland & Struck, 2010, p. 1)

Allegory can also be defined as "a story, poem or picture which can be interpreted to reveal a hidden meaning" (OED, 2019). However, as a sociomaterial sensibility, allegory has a second, perhaps silent significance, as it serves to challenge the dominance of direct representation in current Euro-centric research methods. As such, enlisting allegory as an analytical tool can be described as an act of resistance. Moreover, allegory is useful as a resource for making manifest that which might be absent (Law, 2004), or that which is silent (Latour, 2005). In simulation education, all of the stories of nursing practices that are enacted there are grounded in the literal. Each scenario includes stories which, like allegory, can – and do – occur in nursing practice. The nursing educators take great pains to ensure that each scenario plays out in a realistic way to guarantee that every story that is told there allows the students to make coherent sense of a literal understanding of nursing education. However, at the same time, the stories that nursing educators tell in the scenarios also signify a second, more significant understanding of nursing practice.

An often-cited example of allegory in literature is Bunyan's *The Pilgrim's Progress* (1678/1984), written at a time when the device was designed to impart a moral tale in allegorizing the Christian doctrine of salvation, but it is also present in narrative practices such as fables, parables, and the trickster stories in the oral literatures of African, Afro-Caribbean, and North American First Nations and Inuit peoples. This is an important connection because, as Law (2004) illustrates, allegory often becomes most prominent in times of explicit repression.

When writing about allegory in 2004, Law described it as "a lost art form" because, "at present, Euro-Americans are mostly lucky enough to live in countries which minimise overt political repression" (p. 88). He describes how literal representation dominates the major forms of representation in Euro-America, writing:

> Physical science, biomedicine, social science, but also politics, journalism and current affairs: method is assembled in all of these in the form of statements (or other representations) that correspond to manifest absences in straightforward ways. (2004, p. 88)

This is important, because we can think about how allegory relates to our understanding of reality and how we, as researchers working within a primarily Euro-centric model, make sense of this concept. Law (2004) suggests that, from a philosophical point of view, we all make certain assumptions about reality, depending on our ontological positioning. These promote the notion that empirical evidence maintains that "the world is more or less specific, clear, certain, definable and decided" (Law, 2004, p. 24): that there is only one reality 'out there'; that this external reality precedes us; that it is independent of our actions and perceptions; that it is composed of a set of definite forms; and that it is the same for everyone, what Law (2004) calls a Euro-American "s*ingularity*" (p. 25). What ANT proposes instead, is that direct representation is never direct. It is always mediated by the practices of those who do the describing. In other words, as researchers, by ignoring the interconnected associations of our research practices, the practices of the objects and artefacts that are assembled, and the practices of the materials that we use to co-produce knowledge, we are choosing to obscure some actors and prioritise others.

Furthermore, in choosing to describe directly, and in prioritising direct representation, what is made manifest, or what is being constructed in those descriptions, corresponds to manifest absences – as Law (2004) writes,

> If a statement corresponds to a reality out-there, if it simply seems to describe it, then this is because most of the assemblage within which it is located has been rendered invisible. Othered. The authorship, the uncertainties, the enactment of out-thereness, all of these have

> disappeared. The appearance of direct representation is the effect of a process of artful deletion. (p. 88)

Allegory, then, promotes the art of revealing that which is not said. Law (2004) describes how allegory moves "the boundary between what is manifest and what is Othered" – thus, the literal stories depicted in the narrative are being Othered, and "parts of what is Othered in those versions are being brought into view, made real" (p. 90).

But Law (2004) goes further – he proposes that direct representation, itself, is allegorical. It is *built* in allegory.

> There is nothing direct or literal about the link between present statements and the absent realities. This means that those statements come out (or are telling) of something other or more than the reality they describe. They are effects of allegory that conceal their allegorical origins. That is what representation is: *allegory that denies its character as allegory*." (Law, 2004, p. 89)

Thus, wherever there is representation, there is allegory. Or, as Law (2004) argues, allegory is not lost, it is "covertly practised". We are all "expert allegorists" (p. 89) – skilled at reading between the lines and decoding the literal representations masquerading as 'reality', doubting the official versions offered by experts, dubious of what is being Othered and what is being "brought into view, made real" (p. 90). Therein, however, lies its value:

> And this is what allegory always does. It uses what is present as a resource to mess about with absence. It makes manifest what is otherwise invisible. It extends the fields of visibility, and crafts new realities out-there. And at least, sometimes, it does something that is even more artful. This is because *it makes space for ambivalence and ambiguity*. In allegory, the realities made manifest do not necessarily have to fit together. (Law, 2004, p. 90, emphasis in original)

In nursing education, multiple absences continually disrupt the simulation scenarios – the absence of a real patient, for example, or the prohibiting of certain clinical practices.

However, in presenting a resource to mediate these disruptive forces, allegory is a useful tool with which to make manifest those unspoken practices that are taken for granted (Mol, 2002), for example, those mundane everyday practices of the clinical world that remain elusive for the students. This leads to the second sensibility, translation, which itself is linked to allegory in that it is the means by which the actors become enrolled in the assemblage to participate in these artful, rebellious mediations that promote the crafting of multiple realties.

Translation – the very soul of the process of relating

The sociomaterial sensibility of translation has its roots in the earliest actor network writings, and is particularly useful in simulation education; first, because the metaphor of *theory* being *translated* into *practice* is a dominant concern within medical education in general, and nursing education here. While in English, to translate means to "express the sense (of words or text) in another language" (OED, 2019), in the original French understanding, the notion of translation has particular significance for sociomaterial sensibilities. Because the very act of attempting to make two different words have equivalent expression is impossible, bound up within translation is always the element of betrayal (Callon, 1986b). In French, the word *traduire* can mean: to sue, to prosecute; to translate; to represent; to express (feeling, idea), to show (Knox, 1986). In ANT, translation occurs at the boundaries between order and disorder, when actors connect together and change one another, generating "ordering effects" (Law, 1992, p. 366) that stabilise the assemblage. Thus, to translate is at the same time about "making equivalent, and about shifting" (Law, 2009, p. 144).

To translate is also an act of resistance. Latour (1993), in *We Have Never Been Modern*, writes of the double dichotomy of the illusion of 'modernity'. He proposes that modernity is "doubly asymmetrical: it designates a break in the regular passage of time, and it designates a combat in which there are victors and vanquished" (p. 10). 'Modernity' reinforces the dichotomies and binary oppositions that are produced in defining a set of practices by something that it is not – by what it lacks. Ancients/moderns, winners/losers, domination/emancipation, coloniser/colonised, nature/culture, non-humans/humans; Latour (1993) suggests that, in creating these dichotomies and promoting works of 'purification', 'modernity' "creates two entirely distinct ontological zones: that of human beings on the one hand; that of nonhumans on

the other" (pp. 10–11). However, as Latour (2005) argues, the very act of making these practices distinct and Other, by works of 'translation', causes the opposite to occur: creating these distinctions "creates mixtures between entirely new types of beings, hybrids of nature and culture" (p. 10). Latour (2005) argues that founding the "modern critical stance" (p. 11) on the assumption that there has always been a partition between the natural world and society is paradoxical: as soon as we begin to purify by acknowledging these hybrids, in the very act of taking such a critical stance, we simultaneously resist this purification by transforming (or translating) the dichotomies into a hybrid way of understanding the world.

Perhaps the most fitting aspect of the sensibility of translation in simulation education, however, is its paradoxical and double nature. Callon and Law (1982) describe the *treachery* of translation, revealing its double nature, where "different claims, substances or processes are equated with one another; where, in other words, what it is in fact unlike is treated as if it were identical" (p. 619). At the same time, Law's (2006) notion of *traduction*/*trahison* illustrates that the sensibility of translation always encompasses the practice of betrayal in its own (literal) translation from French: 'traduction' is 'to translate', but 'trahison' translates to treachery or treason; and betrayal. I find Wilson's (2016) conceptualisation of the betrayal of translation most helpful in understanding the powerful effect that these sociomaterial hybrids have on the storytelling practices in simulation education, particularly in relation to the technologies that are enacted in this space. In her examination of the pedagogical potential of images shared in group chats on a social media platform by members of certain professional groups, Wilson (2016) describes how the technological devices that the professionals employ to engage in these activities adopt a very powerful position in determining how the sensibility of translation, and thus, traduction/trahison, is enacted within that pedagogical assemblage. She also describes how these betrayals are multiple – how the translation (traduction/trahison) is performed in multiple ways. For example, the ways in which each professional participant in the chat access the conversation – on laptops, tablets, mobiles – will each translate the images in different ways. Furthermore, in (re)presenting her research, the images are translated further, depending on the ways in which the reader has accessed them; either by printing the report, or by viewing it as a PDF document. Within these translations are further forms of betrayal, present in the choices that Wilson, as the researcher, made when finding the most interesting images

to include in her report, and indeed how she chose to manipulate these electronic artefacts in (re)presenting them in the report (Wilson, 2016, p. 143). Each individual translation of these sociomaterial enactments is an important and powerful contributor to the pedagogical potential of these images. Thus, as Wilson (2016) suggests, the modes of knowing that are generated in these translations depend on "complex and interacting factors, including visual lexis and syntax, cultural and intertextual resources, material media and more" (p. 144). Moreover, there is always the potential for these complex relations to betray.

These concepts are particularly appropriate when considering the practices of simulation education in that a translation can never be an exact replica; there is always an element of loss. As Kearney (2006) illustrates in his introduction to the English translation of Ricoeur's (2004) *Sur la traduction* (*On Translation*), the act of translating can be "a labour of both memory and of mourning" (Kearney, 2006, p. xv) – that it might carry a double duty: "to expropriate oneself as one appropriates the other. We are called to make our language put on the stranger's clothes at the same time as we invite the stranger to step into the fabric of our own speech" (Kearney, 2006, p. xvi). Therefore, the practice of translation is one of absence and presence at the same time; in actor network terms, an Othering of the material semiotics by making present the absent uncanny double – exploring difference through translation to enact a duplicate that is not quite an exact copy. However, as Mol (2010) proposes, in betrayal there is enrichment. And Law (2006) concurs; it is "much more interesting to explore differences than similarities. Much more interesting to trace betrayals in the practice of translation rather than insisting that there is a general set of actor-network principles" (p. 53). The usefulness of the sensibility of translation, then, is enhanced by the effects of this betrayal, particularly when we attempt to consider the complex hybrid of absence/presence in simulation education. As Latour (1993) writes;

> worlds appear commensurable or incommensurable only to those who cling to measured measures. Yet all measures, in hard and soft science alike, are also measuring measures, and they construct a commensurability that did not exist before their own calibration. Nothing is, by itself, either reducible or irreducible to anything else. Never by itself, but always through the mediation of another. How

> can one claim that worlds are untranslatable, when *translation is the very soul of the process of relating*? (p. 113, emphasis mine)

Accordingly, ANT also provides a sensibility for thinking of these hybrid worlds as multiple realities.

Multiple worlds

The third ANT sensibility enrolled in this thesis, and one that is linked to both allegory and translation, is the sensibility of multiple worlds. Mol (2002), in her praxiography of atherosclerosis, eloquently proposes a further act of resistance; one which enacts a philosophical shift in our understanding of how knowledge is mobilised. Instead of making objects the focus of the researcher's gaze, she proposes that the research "follows objects while they are being enacted in practice" (p. 152). As such, Mol (2002) suggests, this shift to understanding objects as being enacted in multiple practices also contributes to:

> a philosophical shift in which knowledge is no longer treated primarily as referential, as a set of statements *about* reality, but as a practice that interferes with other practices. It therefore participates *in* reality. (pp. 152–153, emphasis in original)

However, if we consider objects as "things manipulated in practices" (Mol, 2002, p. 4), the translation of these manipulations varies from one practice to another. When objects hang together in practice, they become more than singular; and "reality multiplies" (Mol, 2002, p. 5). This notion is helpful in exploring simulation education, as the objects manipulated in practice differ from one place to the next; thus, *enacting* reality in simulation practices has the effect of multiplying reality – of making multiple worlds. Throughout this thesis, I refer to the "things manipulated in practices" (Mol, 2002, p. 4) as *objects-as-practice*.

In her ethnographic exploration of an "ordinary disease" (Jensen & Winthereik, 2005, p. 266), Mol (2002), in describing how lower limb atherosclerosis is enacted in different forms in different places, is also describing the performativity of practices. The enactment of atherosclerosis has one reality for the person who is affected; the difficulty of walking, the potential treatment, the day-to-day effects of living with the disease.

For the consultant vascular surgeon, however, the enactment of atherosclerosis has another reality; how far can the patient walk before they need to rest, how does the patient's description of their symptoms differ from the observations they make in the physical examination? These realities, while separate, are connected, but they are not static – they shift. After the decisions have been made for treatment, the enactment of atherosclerosis for the patient shifts; they no longer have pain, they can walk more easily. The patient might need to have part of a limb amputated – their reality of atherosclerosis will shift again. But, for the pathologist examining the limb in the pathology lab, a further reality of atherosclerosis is enacted. It is enacted in the measurement of the thickness of the vessel wall through a microscope. The pathologist determines whether the atherosclerosis was diagnosed properly by making these measurements. Thus, the atherosclerosis is enacted as two separate objects – one in the reality of the patient; and the other in the reality of the clinic. But even within the clinic, atherosclerosis is more than one object, too. Mol (2002) writes:

> Although atherosclerosis in the hospital comes in different versions, these somehow hang together. A single patient tends to be supplied, if not with a single disease, then at least with a single treatment decision. Clinical findings, pressure measurement, social inquiries, duplex outcomes, and angiographic images are all brought together in the patient's file. Together they support the conclusion to treat invasively – or not to do so. This, then, is what I would like the term *multiple* to convey: that there is manyfoldedness, but not pluralism. In the hospital *the body* (singular) is *multiple* (many). The drawing together of a diversity of objects that go by a single name involves various modes of coordination. (p. 84, emphasis in original)

Although Mol's (2002) stories of atherosclerosis can be seen as a vast amassing of empirical materials, as she argues, the stories do not only encompass a field report. Rather, her book is "an exercise in *empirical philosophy*" (p. 4, emphasis in original); one that advocates for the foregrounding of practices instead of making human perspective the central concern of mobilising knowledge. She proposes that:

> It is possible to refrain from understanding objects as the central points of focus of different people's perspectives. It is possible to

> understand them instead as things manipulated in practices. If we do this – if instead of bracketing the practices in which objects are handled we foreground them – this has far-reaching effects. Reality multiplies. (pp. 4–5)

Mitchell (2017), in her exploration of learning and knowledge mobilisation in medical education, was also guided by the ANT sensibility of multiple worlds within her doctoral research. She followed medical students as they developed and implemented improvement science projects as part of a prescribed module. She found that the material objects, such as the vast numbers of paper forms circulating in the ward, were each enacted in different ways, depending on which member of staff was using them. By attending closely to the multiple ways in which these objects were enacted in practice, she demonstrated how the students' learning is enacted in the "location, selection and interpretation" (Mitchell, 2017, p. 165) of these forms by each student or member of staff. As such, these different enactments produce "different realities" (Mitchell, 2017, p. 173). As Law (2002) argues, there are multiple modes of learning, thus there are multiple realities.

Thereby, being attuned to the enactments rather than different perspectives is an important shift: "what we think of as a single object may appear to be more than one" (Mol, 2002, p. vii). As Law (2009) observes, "in theory the body may be single but in practice it is multiple because there are many body practices and therefore many bodies" (p. 152). This understanding has implications for the research described in this thesis because, in seeking to attune to the multiplicity of the enactments of objects in practice, we can perhaps lead ourselves "out of this binary opposition that is also an entanglement: the *self* versus the *other*" (Mol, 2002, p. 135). Adopting this sensibility helped to open up an understanding of the ways in which the objects in simulation education can be understood as multiple realities of the enactment of nursing practice.

In arriving at my understanding of multiple worlds, the process has been both an example of an assemblage and has taken a cyclical but rhizomatic form (Deleuze & Guattari, 2004). Much of my understanding of these ANT sensibilities was consolidated by walking outdoors with other doctoral students and academic colleagues in education studies. We always walked the full distance around a small lake, obliging us to end our journey where it began, discussing our research together and telling stories

of how our projects were progressing. As I neared the end of writing my thesis, and on one of these walks, it became clear to me that the three sensibilities that I chose to adopt were connected in multiple ways. Following Latour's (2005) advice to borrow from narrative theories to "*deploy* actors *as* networks of mediations" (p. 136) in an ANT account, an allegorical analysis of the stories of nurse educators seemed to be a logical starting point. Subsequently, in seeking a language with which to tell this story, the sensibility of translation, as "a relation that does not transport causality but induces two mediators into co-existing" (Latour, 2005, p. 108), helped me to understand how these allegorical analyses built up multiple discursive accounts that served as tools to translate these stories of "relations bundled together" (Law, 2004, p. 94). Finally, adopting the sensibility of translation allowed me to determine how each mediator is enrolled in a performative effect that produces multiple realities (Mol, 2002). As Law (2004) suggests, "allegory is about enacting, and knowing multiple realities" but "allegory is also about the movement between realities" (p. 108). Thus, together, these assembled sensibilities proved to be an appropriate toolkit with which to attempt to trace the sociomaterial in simulation education.

Things manipulated in practices

> While it is possible to define ANT in a series of abstract bullet points to do so is to miss most of the point. Instead it explores and theorises the world through rich case studies. This means that, like symbolic interactionism, for ANT words are never enough: you need to *practise* it. (Law & Singleton, 2013, pp. 485– 486, emphasis in original)

Law (2007), citing Latour's early work on exploring "the semiotics of the practices that lead to scientific truth-claims" (p. 4) in the 1970s, describes the beginnings of ANT as "materially heterogeneous relations analysed with semiotic tools; a symmetrical indifference to the truth or otherwise of what it is looking at; concern with the productivity of practice; an interest in circulation; and the predisposition to exemplary case-studies" (Law, 2007, p. 5). This notion of *symmetry*, in conjunction with the processes of practice, is of particular interest to me. Because one of the main assumptions in ANT analyses is that humans are not prioritised, humans "are not assumed to have a privileged *a priori* status in the world but to be part of it" (Fenwick

& Edwards, 2010, p. 3). Keeping this idea close at hand was particularly useful in observing the practices that are enacted in simulation education because of the complexity of the interaction between humans and things in this space. The interconnectedness of the human and non-human element in simulation education is doubly complex, because it is often difficult to determine where the human ends and where the technology begins. This is why ANT is particularly useful to my research; in addition to resisting the classical notion of how clinical education knowledge is generated, it also challenges the central ethos of the purpose of simulation education: to place humans as the central concern in healthcare and to assume that the materials have no agency within that assemblage. With ANT, humans are not prioritised over non-human actors. Making the assumption that everyday things and parts of things, and even the invisible things, are assumed to be capable of enacting some sort of distributed agency – instructors, students, memories, mannequins, laptops, telephones, air compressors, intentions, disease, hospital beds, medication, and so on – allowed me to think of the enactment of practices that are mobilising knowledges in that particular assemblage. This idea of symmetry makes it easier to consider all of the enactments that contribute to this network, not simply those initiated by humans.

Some critiques of ANT say that the idea of symmetry is absurd – how can humans speak for non-humans (Collins & Yearley, 1992)? How can inanimate things be enrolled in the research process to be interviewed (Amsterdamska, 1990)? How can all of the entities in any given network be considered as ontologically equivalent (Pickering, 1995)? Furthermore, is it ethical to treat humans in this way (Harding, 2008)? Mol (2010) explains how making all of the 'things' equal supports the notion that equality brings about better understanding and opens up possibilities to consider the importance of the mundane, everyday taken-for-granted things that have been overlooked in previous analyses:

> A question that is raised time and again: is this really what an actor is – something like a door, a mere thing? ANT is not very sensitive to this question. Its point is not to finally, once and for all, catch reality as it really is. Instead, it is to make specific, surprising, so far unspoken events and situations visible, audible, sensible. It seeks to shift our understanding and to attune to reality differently. It may

> well be that in the process ANT fails to protect humans from being treated as 'mere things', but it offers something else instead. It opens up the possibility of seeing, hearing, sensing and then analysing the social life of things – and thus of caring about, rather than neglecting them. (p. 255)

Mol's (2010) view enacts a reversal of the idea that symmetry closes down ways of understanding knowledge. Instead, as she points out, by prioritising neither the social nor the material, by not reducing the social to merely human enactments, the opposite effect is possible: instead of condensing meaning-making into smaller and smaller units of analysis, ANT prevents us from considering these enactments as simply being part of a scheme or system. Rather, she proposes, ANT allows us to "learn ways of asking questions and techniques for turning issues inside out or upside down" (Mol, 2010, p, 261) – as a kaleidoscope does. As such, it is possible to be open to sensitivities that might otherwise be overlooked in prioritising the human over the material, which is particularly appropriate in my considerations of the hybridities of humans and technology that greatly influence simulation education. The key element here is that neither the social nor the material is prioritised, but instead, importance is placed on *how* they link together and what they *do* when these associations are formed that is important. In that way, the focus shifts from what a text might mean to how knowledge is produced within its assemblage (Fenwick et al., 2011).

Mobilising ANT sense and sensibilities

Ironically, in attempting to understand the theoretical underpinnings of my thesis, I have chosen to be guided by something that resists being labelled a theory: a theoretical sensibility that is not, by definition, a theory, yet has been given the signifier 'Actor-Network Theory'. Law (1999) suggests that the term, 'actor-network theory' embodies an uncanny tension: it is *intentionally oxymoronic*, a tension which lies between the centred 'actor' on the one hand and the decentred 'network' on the other' (p. 5). However, as Barthes would say, "the Text is always paradoxical" (1971/2001, p. 1472). Thus, in choosing to be accompanied by these ANT-inspired sensitivities in my research, there is an additional benefit for my particular concern. In being afforded the opportunity to think of the network of simulation education as a text, I am positioned in a mode of analysis that is very familiar to me. My background in the critical analysis of

literary texts, as well as in considering film as a text, has given me a firm grounding in being attuned to all of the entities within the network; not simply the human actors, but all of the other semiotic enactments at play. Herein I had an advantage: I already approached my work from the position that "*il n'y a pas de hors-texte*" (Derrida, 1976, p. 158). And ANT provided me with the sensibilities to consider simulation education in the same way.

Throughout the thesis, I aim to tell the story of my own engagement with ANT; how ANT-inspired sensibilities assembled with my previous research experience and epistemological positioning to open up new ways of thinking and to "engage in other types of conversation" (Mol, 2010, p. 266) while attempting to avoid the enduring tension of simplification and making rigid the complexity of simulation education; of removing the fluidity of the research assemblage. As the researcher, then, I also become a thing manipulated in practices – in practising this form of 'diasporic material semiotics', I become part of the research assemblage. In drawing on the ANT sensibilities of allegory, translation, and multiple worlds, I attempt to take up the challenges that ANT brings – to "create and recreate ways of working in and on the real while simultaneously working well in and on the good" (Law, 2009, p. 155).

Chapter 3: Methodology

Praxiography: A way of interfering with the world

> *Methods are not a way of opening a window on the world but a way of interfering with it.*
>
> (Mol, 2002, p. 155)

This chapter describes how Mol's (2002) ethnographic strategy of praxiography guided my research practices. Here I shall explore how the imperialist foundations of ethnography conflict with the aim of ANT to dissolve the hegemonic dualisms that are perpetuated in the myth of the early ethnographers, who wrote "objective colonizing accounts of field experiences that were reflective of the positivist scientist paradigm" (Denzin & Lincoln, 2005, p. 15). Enrolling a praxiographic approach provides a solution to the tensions that are raised when the methods that researchers choose perpetuate binary dualisms – between researcher/researched, stranger/observer, technical/natural – as an act of resistance against the "formalized, systematized, and positivized" (St. Pierre, 2018, p. 603) methodologies that masquerade as qualitative enquiry while being haunted by their Enlightenment scientific methods. I shall consider how this approach allowed me to attune to, and to describe, the actants as being implicit in the story of the nurse educators – and, importantly, how this allowed me to tell "a story about practices" (Mol, 2002, p. 31). I describe how the praxiography was enacted, how the materials were co-produced and organised, and how they were analysed, and I map out the ethical challenges and corresponding decisions that were made throughout the enactment of the research.

The enactment of othering in qualitative enquiry

The development of contemporary qualitative inquiry in social and educational research has been greatly influenced by what is now known as realist general ethnography, a research practice that was dominant in the early 20th century (Erickson, 2011; Mason, 2002). In this model, the researcher was positioned as being distant from the *research objects*, or those who were being observed, creating a distinct boundary between the

observer and the observed, and at the same time, producing an asymmetrical positioning of the social scientist as both *observer* of the social life of others, and as *producer* of the materials drawn from the accounts of the description of what was observed. The researcher was understood to be the powerful active force in this understanding – the one *doing* – as the knowledgeable scientist observing and recording the passive other of those being observed and interviewed – the ones having research *done to* them. Those who were studied were considered "alien, foreign, and strange" (Denzin & Lincoln, 2005, p. 15), while the ethnographer was "lionized, made into a larger-than-life figure who went into the field and returned with stories about strange peoples" (Denzin & Lincoln, 2005, p. 15).

This dominant positioning of the ethnographer as social scientist contributed to the othering of the societies under study – effectively marginalising them as passive participants in the research process rather than considering them as active co-producers of the research material, thus establishing a hegemonic binary relationship (Erickson, 2011). As such, the authority of the modes of knowing of the researcher as scientist was prioritised, configuring the ontological superiority of the types of knowledge produced in the materials and in the way in which it was narrated to "*an audience consisting of people other than those who had been studied*" (Erickson, 2011, p. 46, emphasis in original) – clearly marking the boundaries between subject and object and producing a vast rift between scientific knowledge and the knowledge of those who were being observed.

What ANT sensibilities endeavour to achieve is to challenge and overturn these hegemonic binaries that emerge within this hierarchical understanding of the world. Instead, as Latour (2005) argues, these sensibilities allow us to "reshuffle" the respective understandings of subjectivity and objectivity to imagine the world as "bundles of actor-networks" (p. 218) that are recruited, mobilised, enrolled, and translated to form *objects-as-practice*. Thereby, subjectivity does not solely belong to humans, but is encompassed in the assemblage itself. With ANT, then, the ethnographic methodology is to follow each *actant* as they assemble, disassemble, and reassemble in their relations with each other, and to describe these dynamic gatherings of enacting particular realities (Baiocchi, Graizbord, & Rodríguez-Muñiz, 2013). This

radical approach to ethnography brings about a further shift in understanding the 'things' under study as being multiple. As Mol (2010) writes,

> It is easy, everyone knows what an actor is – an actor does things – it, he, she acts. But no, of course it is not easy, because in different theoretical repertoires an 'actor' is made to be different things. Look at these sentences. First, they state that an actor acts and then that an 'actor' is made to be. From one sentence to the next there is a shift from a real life actor who acts to the term actor which is made to be and, at the same time, a shift from the active to the passive. (p. 255)

Britzman (1995) observes how, in traditional ethnography, the focus of attention is placed on the 'ethnos' and not the 'graphos', in what might be considered a promise of "fidelity to some great original" (Said, 1978, p. 21). Said (1994) cites the methodologies of ethnography as being complicit in promoting the overwhelming presence and implementation of these imperialistic ideologies that ANT proposes to subvert. However, just as Said aimed to disrupt the supremacy of imperialistic ontologies over the colonized Other, ANT provides tools to allow us to tell stories in such a way that the (re)presentation of the worlds it describes disrupts the supremacy of the human actants over the material actants to dissipate the rigid boundaries between them. Ethnography can be considered both a process and a product (Britzman, 1995) of reinforcing the imperialistic ideologies that force nature and culture apart. However, by enrolling ANT sensibilities in ethnographic practices, we can attend to the doing of *things* as well as the doings of the humans, including the researcher, and thus we can enact an ethnography that dissolves the authority of the 'ethnos'. Understanding that these material actants can be both things that *do things* while at the same time things that *become things*, enacts a radical shift in how we might think about how things *practise*. It also enacts a radical shift in our understanding of how knowledge is valued and prioritised. Using ethnographic methods that are not human-centred and which understand actants as objects-as-practice might better be considered as *praxiography*.

Praxiography

Attending to the craftwork implied in practice

Similar to Britzman's (1995) positioning of ethnographic practice as storytelling, Latour and Woolgar (1986), in their "anthropology of science" (p. 27), propose a mode of knowing that can be likened to storytelling; they describe how the "construction of scientific facts … is a process of generating *texts* whose fate (status, value, utility, facticity) depends on their subsequent interpretation" (p. 271). Latour and Woolgar (1986) reveal that many of our scientific research practices produce statements about realities, or "modalities" (p. 77), that allow the assemblage of scientific facts to hang together. However, while these modalities "simultaneously produce statements about realities and the realities they describe" (Law, 2004, p. 59), if these modalities are deleted, they *become something else* – they are translated into the causes of those statements. In the process of making these relations, then, the practices of science also make manifest other realities. This reverses the 'out-there-ness' of our understanding of scientific fact: that scientific realities are "the *consequence* of scientific work rather than its *cause*" (Law, 2004, p. 31).

As Law (2004) observes, in response to this revelation, researchers often fall into the trap presented by this reversal, but Mol (2002) attends to this hazard by urging us to explore the enactment of objects-as-practice in what she calls praxiography.

> An ethnographer/praxiographer out to investigate diseases never isolates these from the practices in which they are, what one may call, enacted. She stubbornly takes notice of the techniques that make things visible, audible tangible, knowable. She may talk about bodies – but she never forgets about microscopes. (Mol, 2002, p. 33)

Enacting an ethnographic study as praxiography thus allowed me to observe the practices of the nurse lecturers in such a way that these practices were never separated from the enactments of the objects-as-practice in simulation (Mol, 2002). These techniques allowed me to make these hidden, taken-for-granted *things* "visible, audible, tangible, knowable" (Mol, 2002, p. 33). Guided first by Latour and Woolgar (1986), I set out to tell the stories of simulated human pedagogies by aiming to achieve three things (adapted from Latour and Woolgar, 1986, pp. 28–29):

1. to perform an ethnography of simulation education, with the aim of providing a monograph of praxiographic investigation;
2. to attach particular importance to the collection and description of observations of teaching and learning activity obtained in a particular setting; and
3. to apprehend as strange those aspects of teaching and learning activities that are taken for granted.

In attending to the craftwork of telling the stories of nurse educators' practices, I also adopted Mol's (2002) understanding that ontology is not singular – that *ontologies* are multiple. That:

> ontology is not given in the order of things, but that, instead, *ontologies* are brought into being, sustained, or allowed to wither away in common, day-to-day, sociomaterial practices. (Mol, 2002, p. 6, emphasis in original)

Drawing on this understanding allowed me to acknowledge that non-human actants also enact their own ontologies – that their practices were just as important to the simulation education assemblage as those of the human actants. Adopting this approach to my enactment of the praxiography thus provided me with a way of practising a decolonizing of imperialistic research methodology – being attuned to the ontologies that emerged in the relations between the human and non-human actants provided me with a way of acknowledging the influence of *all* actants in the assemblage.

Bracketing and unbracketing in research practice

Originally, the purpose of ethnography was to compile "an accurate collection of facts and a comprehensive description of the whole way of life" (Erickson, 2011, p. 45) of the people who lived in colonised lands around the globe. One of the strategies employed by traditional ethnographers is to adopt a deliberate, temporary indifference to those realities. Thus, they conduct their research practices by "setting aside belief in the real in order to bring into view the everyday practices by which subjects, objects, and events come to have a sense of being observable, rational and orderly for those concerned" (Holstein & Gubrium, 2005, p. 496) in a process of 'analytic bracketing'. Similarly, some – although not all – descriptive phenomenologists, following Husserl's

(1936/1970) notion of "transcendental epoché" (p. 148), literally, from the Greek, to refrain from judgement, advocate "holding in abeyance preconceived beliefs and opinions" (Polit & Beck, 2010, p. 268) in an effort to "confront the data in pure form" (Polit & Beck, 2010, p. 268).

However, the act of classifying something by prioritising its lack has a reductive and homogeneous effect and creates a hegemonic binary. The idea that 'pure data' must be entirely free of the researcher's influence rules out any interrelations between them and promotes a form of oppression against any data that cannot be classified as 'pure'. Thus, as Said (1978) proposes, it is precisely the positioning of those who lack by exaggerating their difference to the more valuable and respected 'pure' authority of such ontologies produced in the ethnographer's work that marginalise and de-value the ontologies of the observed, making them become Other. Similarly, as Callon and Law (1997) argue, by bracketing out non-human materials, they become defined by their difference to humans – they become Other. By assuming that materials are passive and have no role to play in social dynamics, a hegemonic binary is created where the social is prioritised and where inequalities are produced and reproduced (Callon, 2006). Conversely, in enacting a praxiographic methodology, this imbalance is removed. As Mol (2002) observes, it is futile to attempt to bracket out the effects of observers in ethnographic research by saying they should not interfere – "they always do" (p. 157). Thus, instead of closing off the interference of the researcher, by acknowledging that the associations between the researcher and the assemblage under study are enactments, we open up possibilities for modes of knowing that are not as oppressive (St. Pierre, 2011).

It is significant, then, that Latour and Woolgar (1986), in their "anthropology of science", borne out of a "desire to retrieve something of the craft character of science", initially intended to *bracket their familiarity* with the object of study in the ethnographic approach they followed: "we regard it as instructive to apprehend as strange those aspects of scientific activity which are readily taken for granted" (p. 29). Adopting an ethnographic approach to determine how scientific facts come into being, they assumed the position of stranger to the culture of the laboratory, whereby making sense of that "alien culture" (Latour & Woolgar, 1986, p. 278) might provide them with insights that they had previously taken for granted as members of that culture. They note criticism

of such methodology, particularly that of Lynch (1982), who posits that such methods are problematic, because it would be impossible for an 'observer' to competently make sense of the technical practices of the scientists. Latour and Woolgar (1986) argue that taking such a stance creates a rigid binary dualism between insider (scientist) and outsider (observer) and, as such, perpetuates the hierarchical notion of the existence of "an (actual) objective character of the technical practices and the real worldly objects of study" (p. 279). Instead, they suggest, their understanding of the stranger/observer in ethnography creates an advantage: because the researcher cannot determine the boundaries between the realms of the scientist/non-scientist, technical/natural, and so on, there is additional freedom to describe the nature of the "society under study" (Latour & Woolgar, 1986, p. 279). In doing so, they note, this method allowed them to achieve much more than what might be considered an "artificial distance" in their research practices – an approach which they suggest allows for "a close collaboration" with those under study, taking from ethnography "the working principle of *uncertainty* rather than the notion of exoticism" (Latour & Woolgar, 1986, p. 279).

Because I am not a nurse educator, nor am I a nurse, it was much easier for me to "make the familiar strange" (Van Maannen, 1995, p. 20) in this space because I was already a stranger to it. However, because I had worked in academic spaces of nursing education and research for many years, it was also familiar to me: I was at the same time close and distant. This uncanny juxtaposition afforded me the unique position of residing neither in the centre, nor in the periphery; being neither authority nor exile, coloniser nor colonised. As such, I assumed neither a single association nor awareness within the assemblage. Instead, my research enactments were "a composite of cultures, identities and affiliations" (Viswanathan, 2005, p. xvii), allowing me to avoid the powerful polarising effect that exoticism might have had on my becoming-researcher positioning.

Research questions

Thus, following Mol's (2002) praxiography methodology allowed me to attend to the aims of the research in multiple ways. First, it allowed me to understand the practices of simulation education as *objects enacted in practice*, or objects-as-practice. However, it also allowed me to understand that "realities are not explained by practices and beliefs but are instead produced in them" (Law, 2004, p. 59). This then assisted me to explore the multiplicity of the objects-as-practice in simulation education by examining how the

layering of parallel realities are entangled and linked together to allow the uncertainties of the phenomenon to emerge in the breaking down of the boundaries between the practice/theory boundaries that are so prominent in nursing education. Below I shall describe my own practices in responding to the research questions. As a reminder, the research questions are:

1. How is the simulated clinical practice space being negotiated by the actants?
2. What teaching practices are being enacted in the space?
3. How are these teaching practices embodied by the actants?
4. What challenges or tensions emerge and how are these addressed?

The sections that follow will describe the human actants, the materialities, and the spaces that contributed to enacting the research, as well as the activities that I undertook to "describe, to be attentive to the concrete state of affairs" to craft an "adequate account" (Latour, 2005, p. 144) in telling the stories of the sociomaterial assemblage of simulation pedagogies in nursing education.

Human actants, materialities, and spaces

Participants – or human actants

Because my main interest was the enactments of nurse educators' practices, I first set out to identify participants who were directly involved in the delivery of clinical skills modules and who employed computerised human simulation in their teaching. Using existing personal contacts within an established network of simulation experts in nursing education, I asked several colleagues to suggest potential participants. Based on these suggestions, my personal contacts approached two nurse lecturers via email to introduce me and my research project. These educators were chosen because they were considered to be 'simulation champions' by their peers, and because each had extensive experience of teaching clinical skills by enrolling simulated human patient technologies. Each educator worked for a different university providing pre-registration nursing education in Scotland. These two schools of nursing were eventually chosen as the settings for the study.

Because the Scottish nursing education context is relatively small, it would not be possible to provide detailed backgrounds specific to both educators without presenting

the possibility that their anonymity might be compromised. However, to provide some contextual information about the participants, I present here some general information about their past professional roles and nursing education experiences. Both participants had spent the last 14 years working as a clinical nursing lecturer after being seconded to teach clinical skills. However, both had been using high-fidelity simulated human patients in teaching clinical skills within their practice roles prior to taking on their teaching roles. While working part-time as a clinical nursing lecturer, one participant also worked part-time as a senior staff nurse in the emergency department of a large regional hospital. The second participant had first qualified and worked as a State Enrolled Nurse, before qualifying as a Registered Nurse in the conversion courses offered in the 1980s, when nursing education moved to a single level of standardised registration across the UK. His nursing career spanned multiple clinical settings for a period of over 40 years. This participant also continued to work several hours per week as a senior staff nurse in a large regional hospital. Both educators enrolled SimMan™ to teach clinical assessment and resuscitation skills, including CPR, defibrillation, and airway management, in addition to team working and communication skills. Both used simulated human patients regularly within their teaching practices.

Both were registered with the Nursing and Midwifery Council and the Royal College of Nurses, and one was also trained as a registered Instructor/Course Director with Resuscitation Council (UK), which works with numerous international councils to standardise immediate life support training for healthcare professionals across the globe. In the UK, all healthcare professionals, including Registered Nurses, must successfully complete the Resuscitation Council (UK)'s Immediate Life Support course on a yearly basis. Both participants were men, however, in both schools, there was a balance of both men and women who taught alongside the participants included in my study.

Settings

In determining the settings for the observations, two different nursing schools were chosen to allow for detailed accounts of their particular practices to be linked and considered in parallel, while at the same time examined separately; not as a form of comparison, but instead, to allow each subtle differences in contribution to the communities within these networks to be adequately explored and allowed to emerge. However, choosing to include two disparate settings also provided me with an

opportunity to consider whether similar practices would emerge between the two educators, thus drawing attention to the possibility that my observations of a single educator's practices might obscure certain practices that are not unique to any one individual (Pring, 2000). Guided by ANT sensibilities, this also allowed me to follow certain objects-as-practice across and between settings (Mol, 2002).

Each nursing school housed a large simulated clinical ward setting, including several simulated ward rooms as well as a simulated Intensive Care Unit. While each school was equipped with several earlier models of SimMan™, each had purchased a more recent version of the mannequin; SimMan™ 3G. Both participants were considered by their peers to have the most expertise in operating the SimMan™ mannequin in their nursing schools, and each had been working with high-fidelity mannequins such as SimMan™ for over 15 years.

Recruiting participants and access to schools

After the initial contact had been made and the potential participants had indicated an interest in the research, I sent each a Participant Information Sheet (Appendix 1), which included detailed information about the study. I offered to meet with them to discuss the proposed research in person. Both nurse educators indicated that they were interested, and I met with each of them at their respective schools. During the initial meeting, we discussed the implications of their participation in more detail, including the nature, purpose, methods, and ethical implications of the study. In addition, each participant was asked to approach an appropriate senior colleague to inform them of their decision to take part in the research and to make the necessary arrangements to obtain my access to the nursing school. Each of the participants agreed to take part and offered to contact the head of their school to secure permission to observe their teaching practices. At this point I asked them to read and sign the Participant Consent Form (Appendix 2), which they both did. Importantly, I emphasised that the purpose of the research was not to evaluate their practices, but that my focus was on their teaching practices; in particular, the ways in which they enrolled simulated human patients in enacting these simulated human pedagogies. In addition, I stressed that the students were not deemed to be *formal* participants, particularly in the ways in which the literature had previously portrayed them, but that I would seek the students' permission

only to report their anonymised speech and description of their activities in the dissemination of the research.

Each of the participants forwarded a copy of the Participant Information Sheet (Appendix 1) and the Student Information Sheet (Appendix 3) to their head of school to introduce me and to ask their permission for the research to go ahead. Both heads agreed and provided me with a letter of permission in the form of an email, which allowed me to gain access to the schools and for the research to proceed.

Permission to report the activities and speech of the students

While the practices of the students were not the focus of this research, they were, of course, integral to the teaching and learning activities and were present during the observations. I also acknowledged that their participation would produce valuable materials in allowing me to understand how the objects-as-practice were being enacted in this space, and that their comments and actions might be valuable in providing the descriptions of the learning activities. During the early planning stages of the research, in discussions with my supervisory team, in preparing my ethics application, and in my annual progress review, it was made clear that obtaining written permission from the students to participate in the research was not necessary. However, it was also emphasised that it was important that the students knew that the study was taking place and that I did seek their permission to include descriptions of their activities, as well as presentations of their speech, where appropriate (Miller & Bell, 2012). After discussing this with the nurse educator participants, they suggested that the students in both schools could be informed about the study by circulating the Student Information Sheet (Appendix 3) on their respective virtual learning environment (VLE) platforms in the first instance, which both educators did.

In addition, during the observations, at the beginning of each class, the nurse educators introduced me to each new group of students and I provided a brief summary of the research, explaining that I was mostly interested in the teaching practices of the educators, and that they were not formal participants, but that I needed their permission to report anything that they might say, and any description of their activities, in disseminating the research. I then handed out paper copies of the information sheet and the Student Consent Form (Appendix 4). I also emphasised that if any students did not give their consent for their actions or speech to be reported, the material they provided

would not be reported in the thesis. However, without exception, all of the students agreed, and each signed the Student Consent Form (Appendix 4). By adopting ethical practices and consent processes that were familiar to those employed in nursing research, I found that the research process was 'normalised' for the nurse educators and their students, thus providing a more positive reaction to the disruption of having to interrupt the teaching routine.

Following the actants in practice

In all of my previous research experience, the methodologies were decidedly human-centred, as are most studies situated in health and social sciences and based on the experiences of human participants. This made it very difficult for me, at first, to de-centre the human and to think about 'things' as powerful actants in a sociomaterial assemblage of enactments. One of the most useful ways in which we might become attuned to the practices of the material actants is to choose an artefact, or actor, and, as Latour (2005) advocates, "follow the actors in their weaving through things they have added to social skills so as to render more durable the constantly shifting interactions" (p. 68). This signifies paying close attention to how the practices of both human and non-human actants influence each other and the assemblage as a whole to become powerful forces within their interactions. The most central actant in simulated human education appears, at least physically, to be the mannequin. It was by beginning to focus on the embodiment of nursing practice in the enactments of the mannequin's practices, and the associations that the mannequin had within the assemblage, that helped me most to make the leap between understanding materialities as being mere passive objects to gaining a sensibility for how they become "things manipulated in practice" (Mol, 2002, p. 4), or objects-as-practice.

In addition, I found Latour's (2005) conceptualisation of the process of social research as being a performance useful – that to tackle the uncertainty of research and to consider all of the actants equally, human and non-human, is "to re-present – that is, to present *again* – the social to all its participants, to perform it" (p. 139) – is to emancipate the marginalised non-human Others and make them visible and verbalizable. Or, as Latour (2005) suggests, "to let the actors have some room to express themselves" (p. 142). Acknowledging the importance of the materialities in these performances effectively disbands the boundaries between the 'pure' and the mess (Law, 2004) of social science

methods. I now present a summary of the processes that I followed in assembling the "heterogeneous ingredients" (Mol, 2002, p. 53) that were generated by the research.

Contextual questionnaire

During the initial meeting with the nurse educators, the conversation included questions about their experience of employing simulated human technologies in their teaching practices, so I did have a wider understanding of their backgrounds. However, in order to complement these conversations, which were not recorded, I invited the participants to complete a brief questionnaire to gather basic contextual information about the use of high-fidelity simulation at their school, such as the number of simulated patients available, details of any arrangements for their maintenance and repair, their approximate original and ongoing costs, how often they are used in teaching, and what types of skills are taught (Appendix 5). Information about the lecturer's clinical and teaching background and in relation to their own clinical education was also gathered in this way. These questions were informed by prominent topics identified in the literature, but were mainly chosen to provide me with valuable "concrete case knowledge" (Flyvbjerg, 2011, p. 304), preparing me for what to expect as I encountered the logistics of the teaching sessions themselves, as well as providing a record of the information that I was not able to record during these initial conversations.

Praxiographic observations

Within an understanding of praxiography proposed by Mol (2002), and guided by Latour and Woolgar (1986) and Latour (2005), the research combined "ANT-inflected" (Law & Singleton, 2013, p. 485) ethnographic observations with in-depth interviews to trace and map out the enactment of teaching clinical skills in nursing education with computerised simulated human patients. As discussed in Chapter 2, Law and Singleton (2013) describe how ANT can best be understood as "a *sensibility*, a set of empirical interferences in the world, a worldly practice or craft" (p. 485), bestowing a more fluid character to its research practices in its ability to create, recreate and explore. This fluidity is well suited to a praxiographic method as it allows for flexibility in tracing the features, movement, connections, disruptions, and agencies of both human and non-human actors within this learning space. At the same time, this method acknowledges that the act of observation itself is a form of interference; that while meticulous records

are being made of the observations, the researcher is also affecting the emergence of these patterns and connections (Mol, 2002).

Originally, I had hoped that the observations for each participant would take place during the same academic year; however, due to an internal restructuring of the teaching timetable for the second participant, the observations at that nursing school were delayed. Hence, the observations for the first participant took place during the 2016–2017 academic year, while those for the second took place during the 2017–2018 academic year. This disruption to the intended plan was serendipitously beneficial for the research as a whole, however, as the analysis for the first participant had already begun by the time I started making observations with the second. This meant that the associations I was observing in my analysis of the first setting influenced my practices of observing the second, allowing me to become more attuned to the movement and distribution of hidden enactments.

Digital videoglasses

To supplement the textual accounts gathered during the observations, I invited the lecturers to wear digital videoglasses to provide their personal visual perspective of these sociomaterial assemblages while they taught. This method had previously been used to record the practices of medical students in a simulation learning setting to examine how they coped with the complexity of learning in a simulated clinical environment (Gormley & Fenwick, 2016). Because I had decided to instead foreground the practices of nurse educators, I thought that this method of capturing their practices would be helpful as a means of assisting me in the interviews with the participants in the same way as Gormley and Fenwick (2016) had; to allow me to "explicate perceptual knowledge that usually remains tacit and objectivize the *pre-reflective and not immediately verbalizable*" (pp. 140–141).

The digital videoglasses comprise a small camera, mounted on the arm of a pair of glasses; either the participant's own, or a pair of plastic-rimmed eyeglasses with clear, non-prescription lenses (see Figure 2). The battery-powered camera records both sound and video material, and houses a micro-SD card on which the video files are stored. The original purpose of obtaining audio-video recordings with the videoglasses was to review them and replay them with the participants to generate topics to explore during the individual interview conversations, drawing on the Point of View (PoV) method of

interviewing that is popular in the social sciences and has recently been promoted for health education research by Skinner and Gormley (2016). Recording the teaching practices in this way allowed me to capture "peripheral events" (Skinner & Gormley, 2016, p. 237) to guide the interviews in such a way that deeper information could be elicited in what might be described as "a verbalization of implicit knowledge" (Skinner & Gormley, 2016, p. 236). In addition, the videos supplemented and augmented the textual accounts gathered during my observations and to provide the educators' personal visual perspectives of these sociomaterial assemblages (Gormley & Fenwick, 2016) of their teaching practices. By including this additional layer to the observations, the tacit and taken-for-granted knowledge of the lecturers that may have been hidden from my observations were highlighted and preserved.

Figure 2: The digital videoglasses assemblage

Although the footage from the videoglasses was originally designed to supplement the interviews, it soon became apparent that the videos provided much more. By "making visible the unverbalizable" (Skinner & Gormley, 2016), the videos also provided me with a means of obtaining the hidden effects of the network. Not only were the peripheral events captured, but also, by placing the camera on the body of the educator, at their eye-level, a surprisingly intimate representation of the educator's teaching practices emerged. Not only the human, social aspects of their practices (such as what they were saying, for example), but the non-human, less 'verbalizable' artefacts that formed part of their teaching practices emerged. For example, the use of their own bodies to teach, the breathing, movements, silent pauses, and gaze, began to emerge more as effects, or as material artefacts, within the teaching and learning assemblage. Moreover, because these artefacts were recorded, I was able to revisit them repeatedly, allowing new connections in the assemblage to be revealed. This making visible of the

unverbalizable is a particular feature of the videoglasses that give them the role of what Adams and Thompson (2016) refer to as "digital co-researcher" (p. 100) – and, in doing so, they facilitate a fundamental tenet of ANT: as Mol (2010) says, "to make specific, surprising, so far unspoken events and situations visible, audible, sensible" (p. 255).

The audio-video recordings obtained from the videoglasses were transcribed and the texts that were generated were included in the analysis of the materials. In addition, they were also reviewed to generate topics to explore during the individual interview conversations with the participants. By including this additional layer to the tracings, the tacit and taken-for-granted knowledge of the lecturers that may have otherwise remained hidden were explored in more depth (Gormley & Fenwick, 2016).

Audio recordings

After the first full day of observations, it became evident that the battery life of the digital videoglasses was relatively short, and that it would only last for an hour at most. I decided to employ them as much as possible by recording only every other simulation scenario and charging the battery in between sessions. As a failsafe, I asked the participants to also wear digital voice recorders fitted with a microphone that attached to the collar of their shirt. The recorder was then placed on the participant's trouser belt or in their pocket. Both participants agreed, and, after the first day, I asked them whether the equipment was hindering their practices. Both indicated that they were accustomed to wearing similar devices while recording lectures and did not find that they interfered with their teaching practices.

While these audio recordings were not fully transcribed, they were very useful. They served to support the observation notes I had made in that I could cross-reference them with events that I could hear on the recording, and they acted as an aide-memoire when I performed the analysis. In addition to contributing to a greater understanding of the complexity of the simulation education assemblage, they also instilled a sense of the flow of the educators' teaching practices, making it easier for me to recognise patterns as well as interruptions, disruptions, and breakdowns in the associations between actants in the network.

Elicitation interviews – conversations about practices

The interviews with the participants took place as soon as possible after all of the observations of the teaching sessions were complete. One participant chose to be interviewed in his office, while the other visited my university. Each interview was structured in the form of a conversation, talking to the lecturers about the materialities, relationalities, heterogeneities, and processes that had emerged throughout the observations. These elements were explored and expanded upon by using the video material captured from the digital videoglasses as a means to structure the interviews by prompting memories and providing a way for the participants to describe the abstract "knowing-in-action" (Schön, 1995, p. 30) and discursive knowledge without disrupting the assemblages during observations. Further, they facilitated a discussion of the educators' perceptual knowledge of their teaching practices (Gormley & Fenwick, 2016) that might remain concealed in a more traditional form of ethnographic interview (Gore, Rix-Lièvre, Wathelet, & Cazemajou, 2012). Excerpts from each video were played on a laptop during the interviews (Figure 3), but each was selected by moving to a set time in the recording so that the video could be continued should the participant wish to see more footage around the selected excerpt. The excerpts lasted between two and seven minutes in length, and a total of six excerpts were chosen for each participant. The interviews were recorded on a digital audio recorder, and both conversations took place over a period of approximately 2.5 hours.

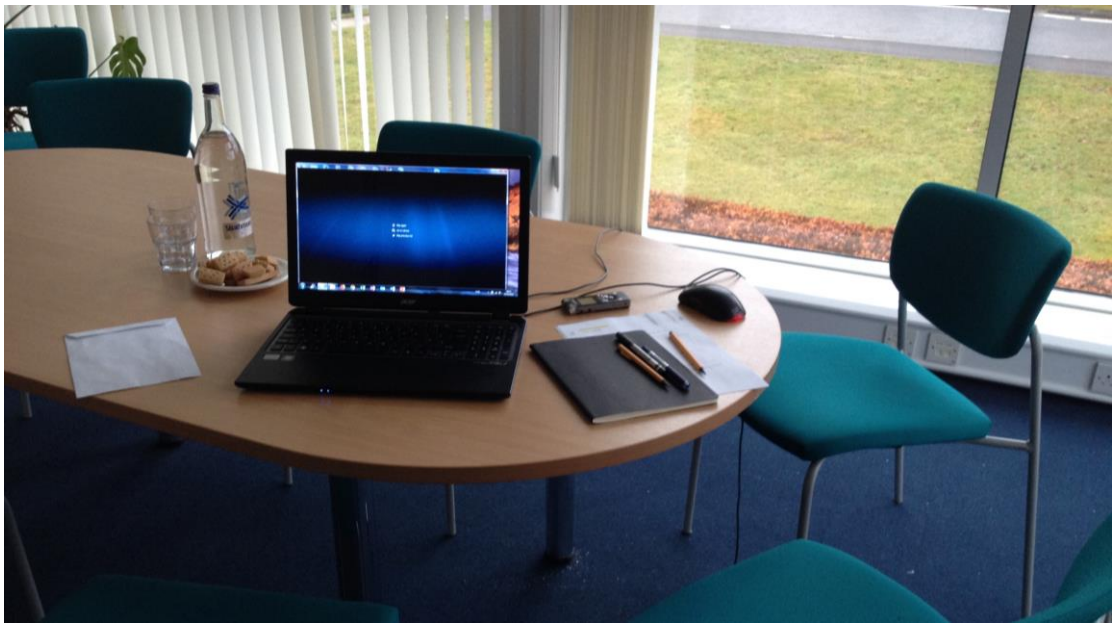

Figure 3: The elicitation interview setting and materials

In choosing the excerpts, I found it useful to refer to Adams and Thompson's (2016) conceptualisation of hermeneutic relations to develop questions about the embodiment of the relationships between the educators' practices and the materiality of the teaching space. Drawing on the works of McLuhan and McLuhan (1988) and their four "Laws of Media", Adams and Thompson (2016) propose a set of appropriate "interview questions" (p. 65) to consider when exploring the ways in which technology mediates sociocultural practices. While they did not form the questions I asked of the human participants, they did allow me to choose points in the videos to highlight and to ask appropriate questions "to make visible the trajectories and tensional aspects between the current situation and the medial environment that a technology mobilizes" (Adams & Thompson, 2016, p. 66). An example of the interview schedules that guided the conversations with the participants is presented in Appendix 6.

Organising the materials

Observations

The teaching sessions that I observed were organised in slightly different ways for each nursing school. Participant 1, George, taught four groups of six students within five 45-minute sessions over the course of a day, separated by two brief introductory lectures – one in the morning, and one in the afternoon. Three other educators worked in tandem, and the four groups of students moved in a circuit from one educator to the next, ending the day's sessions with the same educator with whom they started. This allowed the educators to observe how their immediate life skills had developed over the course of the day. Each 45-minute session comprised approximately three simulation scenarios with two students participating and four observing, which allowed each of the six students to participate in each session at least once. However, sometimes the scenarios involved three or more students, and, towards the final sessions, some scenarios involved all six of the students in the group. De-briefs were incorporated into the end of each scenario. I observed 16 days of teaching with George.

Similarly, for John (Participant 2), three other educators worked in tandem in adjacent simulated ward rooms, with the students moving in a circuit between the scenarios and self-directed study sessions. The simulation sessions were grouped into eight 35-minute sessions. Each session comprised one simulation scenario, of approximately 25 to 30 minutes, with a five-to-ten-minute de-brief afterwards. Each session included between

eight and 10 students, with between two and five students participating in the scenario and the others observing. I observed 5 days of teaching with John.

Fieldnotes

> Fieldnotes are surrounded by legend and often a certain secrecy. They are intimate records, fully meaningful – we are often told – only to their inscriber. (Clifford, 1990, p. 52)

The observations were made while the nurse lecturers enrolled the simulated human patients in teaching clinical skills and during any preparatory and follow-up sessions related to these classes. During the observations, I adopted several approaches to note-taking, each of which combine to comprise what are traditionally referred to as fieldnotes (Atkinson, Coffey, Delamont, Lofland, & Lofland, 2001). First, so as to become immersed in the setting (Mason, 2002), my fieldnotes were minimal, taking the form of "jottings" (Emerson, Fretz, & Shaw, 2011, p. 123) so as not to disturb my initial familiarisation with the space. I made hand-written accounts of my observations in paper cahier notebooks, describing what I could see and hear in my observations as the scenarios unfolded (observation notes). Second, I made drawings and sketches to complement the visual observations as well as the photographs. As the observations continued, I documented any new and unexpected connections in a process of analytic writing by my generation of "in-process memos" (Emerson et al., 2011, p. 123), allowing insights identified in previous observations to be integrated and linked.

Photographs

Where appropriate, photographs were taken to capture the spatial arrangements and other materialities within the teaching spaces. These were initially designed to serve the purpose of illustrating context in the thesis and did not include any images of participants or other individuals. In addition, I did not intend to use them for performing a formal visual analysis. However, at several points during the observations, I was invited by the educators to photograph and video-record certain activities when students were not present (see the breakdowns section in Chapter 5), which I did. During these encounters, educators other than the study participants were often present. However, these individuals were also very supportive of my research and urged me to include any images that might be useful in reporting the research, granting

me permission to include them. Throughout the course of the analysis, these contextual photographs were very valuable in allowing me to re-visit these objects-as-practice by linking them with the other materials that were generated through the research, as outlined below.

Fieldwork diary

In addition to the notes and sketches made during the observations, I maintained a fieldwork diary (Atkinson et al., 2001) to serve as a way to reflect on my overall understanding of each encounter and so that I might become attuned to any influences that I, as the researcher might be having on the research assemblage. This allowed me the space and time to disentangle the "contradictions, limits, messiness and hidden struggles" (Punch, 2012, p. 92) of the research process and acknowledge how they might influence my understanding of the nurse educators' practices while offering useful ways of understanding the "messiness" (Law, 2004) of simulation education. In addition, these notes were invaluable for recording any decisions that I had made along the way in steering the research in a direction other than the one I had initially intended. I made these reflexive notes at the beginning of each observation day and again at the end of the day, after the observations had finished. These notes were reviewed regularly, and any notable events were recorded in a research log in the form of a spreadsheet to describe each research activity and the decisions made to steer the process. In addition, each of the materials I had produced were recorded in this log. Because each observation session generated multiple materials, it was important to ensure that the observation notes and fieldwork diary were labelled clearly, that each audio and video file was named appropriately, and that each item was recorded correctly. As soon as possible after each observation day had finished, the audio and visual data files were stored securely on the password-protected and encrypted drive provided by the University of Stirling for the purpose of protecting sensitive material. A summary of the materials gathered is provided in Table 1 below.

Table 1: Summary of the study materials

Participant	Observations and Simulation Scenarios	Video recordings	Audio recordings	Interviews
P1 George	16 days (112.5 h) 5 x 45-minute simulation sessions per day, each comprising three separate scenarios with groups of 2 to 6 students participating/observing December 2016 to April 2017	21 h 18m footage	40 h 34 m recordings	Interview 1 (2 h 33 min) July 2017 Interview 2 (2 h 41 min) December 2018
P2 John	5 days (32 h) 8 x 35-minute simulation sessions per day, each comprising one scenario with between 2 and 5 students participating, and up to 8 observing September 2017 to February 2018	6 hr 2 m footage	19 h 39 m recordings	Interview 1 (1 h 46 m) March 2018 Interview 2 (1 h 30 m) December 2018

Each of the ways in which I organised the materials was enacted in an iterative constellation of practices and records, informed by traditional ethnographic methods, and guided by ANT sensibilities. The generation of these materials followed what Clifford (1990) calls the "orders and disorders of fieldwork" (p. 51): by enacting practices of *inscription*, *transcription*, and *description*, I engaged in the *graphos* element of ethnography. However, by breaking down the barriers between these practices, alternating rapidly between them within the shifting assemblage of encounters, I was disrupting the "misleading unity" of the notion of "fieldwork" (Clifford, 1990, p. 52), a process which Clifford (1990) describes as having a "defamiliarizing effect" (p. 52). When considering the combined effectiveness of these writing and recording practices in tandem with the sensibilities of ANT, it is clear that moving fluidly between them, allowing them to *intra*-act and in aiming to de-centre the

'pure' and 'authentic' writing practices of traditional ethnographic processes allowed me to enact them more as a heterogeneous assemblage of sociomaterial practices (Fenwick, Doyle, Michael, & Scoles, 2015) than a rigid prioritising of the written text.

Pilot study

While the combination of each of the writing and recording methods was designed to enhance the accounts of the simulation learning assemblage, the practical considerations of juggling observation and note-taking within the chosen technological teaching and learning spaces are complex. In order to assess the suitability of this combination of methods, a pilot study was carried out in a similar setting that was not included in the study itself (Cohen, Manion, & Morrison, 2017). Because examples of first-person video capture are rare in the literature, it was important for me to consider the way in which the digital videoglasses technology might have interfered with the teaching practices of the participants. However, the pilot also provided an opportunity for me to test the various ways in which I might best record my observations as well as how I might document the different types of notes I was generating, for example, how I might record the questions that I wished to explore in the interview conversations with nursing lecturers.

Analysis of the heterogeneous ingredients to enact multiple realities

> ANT strives for descriptions of a very particular and foundational activity: the assembling, disassembling, and reassembling of associations. Following human and nonhuman actants and their translations, ethnographers are charged with describing the dynamic, though not necessarily successful, work of enacting particular realities. (Baiocchi et al., 2013, p. 336)

My analysis of the materials collected in the observations, in the form of observation notes, fieldwork diary entries, videos, and audio recordings, began at the point of transcription. First, when reflecting on my field notes during lunch breaks and at the end of each day, I annotated these and compiled additional reflective notes in a separate notebook (fieldwork diary). This form of analysis continued while I transcribed these by typing them into a Word document. I also transcribed each of the video recordings using a transcription software program and a foot pedal. During the transcription

process, further annotations were made with the 'Comments' function in Word, when particularly powerful effects became immediately apparent, and the time at which each of these occurred on the recording was included in the transcript. I then pasted the transcripts into a column in a large table in MS Word, including the text from the comments. While replaying the videos, I continued to record my analysis narrative in the right-hand column.

When choosing particular enactments of practices to include in the analysis, I was most concerned with "mapping the trajectories" (Law & Singleton, 2003, p. 2) of what can be described as "elusive objects" (Law, 2004, p. 86): to look for stories of enactments that were allegories for "*that which cannot be told*" (Law & Singleton, 2003, p. 22, emphasis in original). In other words, to look for hidden enactments that were normally ignored, marginalised, or taken-for-granted, but which were also able to move and slip between different practices and different sites, often changing shape unnoticeably – enactments that were Othered. Because these elusive enactments interested me most, I began to compile a further table of what I described as *interesting things*.

As the analysis progressed, the qualitative analysis software program, Transana (Woods, 2013), was enlisted to assist in linking the multiple forms of material and to enable me to move quickly to particular points in time on the audio-visual recordings. I had piloted the software by loading the audio and video files along with the text, and the ability to link the text to specific points in the footage was invaluable for me as I moved through the analysis to mobilise the hidden taken-for-granted objects-as-practice that allowed the assemblage to hang together.

Throughout this initial analysis, the annotated text in the comments was cross-referenced with the observation notes. As I typed the narrative, I continued to watch the videos, using a foot pedal to control the playback so that I could move backwards and forwards in the recording, or pause it so that I could lengthen the stories that the enactments within the simulation education assemblage were telling me. I repeated this process with the audio recordings, but this time reversed the process, beginning with a transcription of the observation notes and annotating them with selected excerpts transcribed from the audio recordings. I found that this technique permitted me to perform a hybrid of complex critical reading/writing practices in association with each of the digital "co-researchers" (Adams & Thompson, 2016, p. 87) that I had enrolled:

the electronic foot pedal and its accompanying transcription software, the desktop publishing functions embedded within the MS Word software, the PC and laptop and all of their operating systems, and the keyboard, mouse, monitor, and speakers. The Transana (Woods, 2013) software allowed me to link each of these artefacts quickly without having to search through the audio and video recordings and separate Word files. However, I found it difficult to use Transana (Woods, 2013) for recording the text that my analysis was generating, and instead typed the narrative in a Word document template. This process as a whole made manifest a keen awareness of what Britzman (1995) describes as the "contradictions and the performances of power that both suture and unravel" (p. 237) within any ethnographic text. The Transana (Woods, 2013) software seemed to at the same time prioritise some of the materials while marginalising others by mediating my analysis practices. While it was useful as a search tool, I also found that returning to my original hand-written notes, watching the videos of the nurse educators' practices, and typing my analysis within a Word document were effective in deflecting this interference of the software in the analysis process.

After re-reading these texts several times, while watching the videos or listening to the recordings, I continued to assemble my collection of *interesting things* – noticings of enactments of objects-as-practice that emerged to exemplify how: the simulation teaching space was being negotiated by the actants; how the teaching practices were being enacted and embodied by the actants; and the disruptions and tensions that emerged to allow this assemblage to hang together. These initial noticings were mobilised into a distilling of these objects-as-practice, and served as the starting point for developing a series of posthuman anecdotes to tell the stories of the practices of nurse educators in their enrolment of simulated human pedagogies.

Posthuman anecdotes

Leading on from Latour's (2005) direction to follow the actors, I also found the sensibility of "gathering anecdotes" (Adams & Thompson, 2016, p. 24) helpful. This allowed me to "describe how the object or thing appeared, showed up, or was given in professional practice or everyday life" (p. 24). As described in Chapter 2, anecdotes can be described as "the unelaborated narration of a single incident" (Abrams, 1999, p. 286); a description of "*what happened*, not why it happened" (Adams & Thompson, 2016, p. 25, emphasis in original), and it does so in "*experiential terms*" (van Manen,

2014, p. 34, emphasis in original). Adams and Thompson (2016) argue that the anecdote is particularly useful in ANT-guided research. By conducting "posthuman, thing-sensitive interviews with human participants" (p. 27), and by "acknowledging the presence of both human and non-human actors enacting and enacted by practices" (p. 26), the approach to analysis is both radical and resists the centrality of the human in ethnographic research. In addition, it was useful to adopt Adams and Thompson's (2016) suggestion of "following the hybrids", or "co-agents" (p. 38) throughout the analysis process. The "object interview questions" provided by Adams and Thompson (2016, p. 23) helped me to think of the simulation education assemblage as a hybrid assemblage of associations. By being attuned to who or what actor is enacting, what they are doing, and how they gather, inter-act, and configure to enact practices, allowed me to think of them as co-agents, or, perhaps, co-actants, in the teaching and learning assemblage: "how people, objects, ideas, discourses, and events gather and *do* as an assemblage" (Adams & Thompson, 2016, p. 40, emphasis in original).

As well as being a suitable method for attempting to describe how the social and the material connect and interact, ANT sensibilities are also useful for analysing the continuously shifting effects of the "minute negotiations that go on at the points of connection" (Fenwick et al., 2011, p. 97) as a way of understanding "how relations assemble, or do not" (Law, 2009, p. 142). The very nature of ANT-inspired research presents the challenge of generating myriad materials. As Latour says, "everything is data" (2005, p. 133). Because the materials were themselves gathered into assemblages of information, it was important to employ a system of analysis that allowed for fluid movement between observation notes, interview recordings, transcripts, video footage and research diary to allow these important negotiations to emerge. However, it was also difficult to determine where to begin. Other researchers (for example, Booth, 2013) have found it useful to start by "following the travels" of the actors (Rimpiläinen, 2012, p. 277) in the material as a way to begin to disentangle the vast volume of information that is generated. While this process of "translation" always involves an element of loss where the network must be "cut" to follow the movement of the actors, this process also allows the analysis to "stop" (Strathern, 1996, p. 522), but in such a way that it can be seen as a resting place or turning point rather than a dead end. For example, I made a conscious effort to only follow the nurse educators within the spaces where simulation teaching took place, and to limit my observations to the simulation lab

and the observation room. While this decision to cut the network at the boundaries of the simulation lab did stop the "flow" (Strathern, 1996, p. 525) of the connections to and from the simulation teaching and learning assemblage, the enactments of practices within that space provided me with a great deal of material that took the analysis elsewhere – into nursing practice, for example, as the stories that were being performed there were performing multiple worlds into being. This enacted a form of "bringing flow back" (Strathern, 1996, p. 527), particularly during the analysis process. Following these actors through the assemblages of material in the same way assisted me in determining how the simulated clinical practice space was being negotiated by the actants.

Recognising the importance of considering the interactions between all of the actors benefitted the analysis by providing opportunities for the hidden, silent, and taken-for-granted connections to emerge. Further, the nurse educators' reactions to these connections, the strategies that they adopted and where they were drawn from in relation to the simulation were considered alongside these patterns, provided a multi-faceted and layered approach to the analysis that complemented the use of multiple ethnographic methods.

Verbalizing the invisible

The sensibility of allegory was also especially helpful in allowing me to identify the "elusive objects", or "that which is not said" (Law, 2004, p. 87) within the materials, particularly as the idea of allegory emerged strongly in my analysis. Law (2004) argues that, because the major forms of representation in Euro-America are 'literal' representations, prioritising direct descriptions, research methods prioritise "statements (or other representations) that correspond to manifest absences in straightforward ways" (p. 88). Paradoxically, because we have placed a priority on ensuring that we "mean what we say" in contemporary research narratives, the art of allegory, the art of meaning something *other*, and perhaps more significant, has been lost. Law (2004) argues that, instead of relying only on direct representations, by "extending realities", allegory provides a "mode of discovery" to allow for "a set of tools for making and knowing new realities" (p. 90). Importantly, "It uses what is present as a resource to mess about with absence. It makes manifest what is otherwise invisible. It extends the fields of visibility, and crafts new realities out-there" (Law, 2004, p. 90). Enlisting this

sensibility while gathering the anecdotes assisted in promoting the difficult task of maintaining the notion of symmetry in the analysis.

While computer-assisted qualitative data analysis software (CAQDAS), such as Transana (Woods, 2013), can be very useful in assisting qualitative researchers in the analysis of multiple forms of materials, I used the software only as a means of organising the multiple forms of material and not to provide a means of analysis. In the past I had had experience of having to devise a system with which to effectively coordinate the storage, retrieval, and organisation of a large and varied set of materials, so I did want to be able to enrol the technology to assist me in this regard. However, having had previous experience of working with similar CAQDAS tools in my work, I was also wary of the barriers that CAQDAS sometimes presents – in its systematic and rigid modes of organising the materials, much of the surprising and serendipitous complexity of the stories lying dormant in the assemblage remain hidden. Thus, in aiming to tell the stories of nurse educators in their enrolment of simulated humans in their teaching practices, I anticipated that these co-productions of research stories might serve to prioritise their own modes of knowing, and thereby push my own research practices to the periphery. In seeking to enrol myself as the storyteller, I wanted to awaken the sleeping potential of the hidden and not always immediately visible lives of these assemblages by foregrounding the creativity in the material. As such, I deliberately chose not to delegate the work of analysing the materials to the technology in weaving these stories together so as to allow my own imaginative dimension to make the analysis distinct (Okri, 2015).

Ethical considerations

In accordance with the conditions set out by the funder, in performing this research project, I was primarily guided by the Economic and Social Research Council (ESRC) (2015) *Framework for Research Ethics*. However, in addition, I also adhered to both *The University of Stirling Code of Good Research Practice* (University of Stirling, 2016) and the British Educational Association (BERA) *Ethical Guidelines for Educational Research* (2011). Moreover, being familiar with the biomedical model of research ethics embodied within healthcare research, I brought to my own ethical considerations those expectations that nurse educators might have of any research undertaken within the field of nursing practice, such as those outlined in the Declaration

of Helsinki (World Medical Association, 2013). However, the expectation that my research would conform to the more familiar biomedical model that is adopted in nursing education research created a tension in introducing ANT sensibilities into the nursing ethics processes. For example, when taking a sociomaterial approach, it is assumed that all actants participate in the research assemblage (human and non-human), and that it is impossible to disentangle those who have agreed to participate in the research, those humans actors who have agreed to be 'followed', and those who might appear, participate, and depart, however briefly, in any ethnographic-inspired methodologies. From a practical perspective, the nursing schools were quite happy to categorise the students as 'non-participants', as this removed the need for a second round of ethics approval within their own institutions. The ethics committee at the School of Education in my University, however, insisted that the students provided their consent for me to publicly report their activities, or anything they might say. Thus, in addition to being informed about the study, each student I observed would also have to sign a consent form to agree to any of their speech or activities being reported. This amendment, while reassuring to me, as a researcher, and perhaps to the educators themselves, interfered substantially with the teaching practices. Before the beginning of each day's observations, each student I encountered was asked to re-read the information sheet that they had been sent previously, and sign the consent form before the scenarios could begin. This was disruptive and time-consuming, stealing precious minutes away from each group's allotted simulation learning time. For George's students, it was possible to process all of the groups at the beginning of the day. However, John's students arrived at the simulation lab in eight different groups each day, and the disruption to his groups was much greater. We managed to alleviate this interference somewhat by scheduling my subsequent observations on weeks when the same groups of students were participating in the scenarios, but the disruption that the ethics committee imposed perhaps illustrates how powerful the enactments of ethics approval are in influencing how researchers might choose to perform their work. Had I then chosen to abandon my praxiography and conduct a more traditional mode of research, this may have been an example of what Haggerty (2004) defines as 'ethics creep': the idea that increasingly formalised ways of scrutinising research proposals, borrowing from multiple disciplines, effects a sort of "rule fetishization" (p. 411). This creates a paradox where a "distinct but unquestioned rupture between following the

rules and conducting ethical research" (p. 410) occurs, and the ethical process itself can perpetuate unethical behaviour.

While there is a need to be critical of the processes of enacting ethical approval, it is also crucial to consider the ethical implications thoroughly and carefully. Because there were only two participants, great care was taken to preserve the anonymity of the individuals and to guarantee that their thoughts and ideas would not be able to be traced back to them (Thomas, 2013). However, it is impossible to completely rule out the possibility that those who are familiar with the places, and even the teaching practices, of the nursing schools will be recognised. Once the research findings are made public, there is a possibility that any potential contestations, particularly those between each school's policies and the practices of the educators, might have implications for the participants within their working environment. Therefore, the manner in which the materials are presented here, and elsewhere, was considered very carefully before they were disseminated. Multiple discussions in collaboration with experienced peers were undertaken prior to the start of the fieldwork, and these continued throughout the entire research process to explore the ethical integrity of my research activities, particularly given the ethical considerations of challenging taken-for-granted theoretical assumptions of the benefits of simulation in nursing education. In addition, the implications of the educators, and their schools, being identified were discussed with the participants. An ethics application was prepared alongside the initial discussions and the proposed research study was approved by the Ethics Committee of the School of Education at the University of Stirling.

Risks and burdens to participants

In order to preserve the anonymity of the participants, all identifying characteristics were removed from the field notes, transcripts, research diary, and research log, and each participant was provided with a code number throughout the process of recording and analysing the materials (Hammersley & Traianou, 2012). Very limited demographic information related to the participants has been reported here, and their individual characteristics are not linked to specific details. In addition, each participant has been given a pseudonym, one of their own choosing, in the descriptions that are presented in this thesis: the first participant is called 'George', and the second is called 'John'. In relation to the students, their role in the simulation education assemblage is

crucial, and it is equally important that they are not able to be recognised in any reports of the findings. In the reporting of the students' speech and activities, their names have also been changed.

Great care was also taken to ensure that the recorded material has been stored securely on the University's encrypted data storage facility. Any duplicate copies loaded into the data management software or into the transcription software will be deleted after my doctoral programme is complete. The recordings were only accessible by me, and the related transcripts were anonymised during transcription. I had sole access to the transcripts and shared only excerpts with my supervisory team. One printed copy of the anonymised transcripts and any other documents printed for the purpose of analysis have been kept secure in a locked cabinet on the University campus. These will be shredded after my doctoral programme is complete. Copies of signed consent forms, ethics permission letters, letters of access, and any other pertinent information in relation to the study will be kept in the site file, as directed by *The University of Stirling Code of Good Research Practice* (University of Stirling, 2016), for a period of ten years after the doctoral programme is complete. Any electronic correspondence in relation to the study and its participants will be similarly archived. The rights of the nurse educators as research participants were continually observed; the right to their own safety, the right to withdraw from the study at any time without providing a reason, and the right to seek independent advice and guidance (Hammersley & Traianou, 2012).

In addition to these procedural considerations of ethical stringency, I also endeavoured at every stage of the research to embody the dimension of ethics that Guillemin and Gillam (2004) refer to as "ethics in practice" (p. 264). As such, I acknowledged that, just as the practices I was observing were materially enacted (Mol, 2002), so was I implicit in the practices I was observing. In my interfering with the enactments of simulation in nursing education, my research enactments, my imagining and analysing, my ghostly presence, my research practice became "a practice that interferes with other practices" (Mol, 2002, p. 153). Coming to this understanding allowed me to critically examine the ethical implications that my research practices had on the learning and teaching assemblage. This in turn strengthened the ethical considerations of my research by challenging what Mol (2002) describes as "disembodied contemplation" (p. 152). Choosing to be guided by the sensibilities of ANT also contributed to a

philosophical shift in my own positioning that enhanced the integrity of the research: in acknowledging that the researcher is inextricably enmeshed in the enactments of the spaces being observed, the researcher's gaze moves away from the observer's eyes, shifting the emphasis onto what I, as researcher, am *doing*, thus recognising that my enactments are implicit in the research assemblage (Mol, 2002).

Adopting this reflexive attitude towards the research and establishing a good relationship with the participants based on trust and good rapport allowed me to promote a climate of reciprocity, maintain respect for the changing needs and environment of the participants, and ensure that any concerns that they may have with the presence of the researcher were dealt with sensitively and alleviated quickly (Guillemin & Gillam, 2004). Engaging in a continual process of reflection and discussion with the participants and my supervisors supported this research to present opportunities for ensuring its ethical integrity.

Integrity of the research

First, and continuously throughout, an assiduous approach to record-keeping was adopted. This allowed for a record to be made of all of the choices that were made, providing a method of creating an "audit trail" (Olesen, 2005, p. 252) of the research. The purpose of this exercise was not only to add to its transparency and to discern all of these decisions and account for their outcomes (de Kleijn & Van Leeuwen, 2018), but also, to serve as a form of analysis. These records were made continuously throughout the research process; during observations, in writing up reflexive notes in a field diary, and continued during the transcription and analysis stages. In addition, drawings mapped these decisions to allow me to form a visual understanding of how each related to the research assemblage as a whole. These journals were revisited and read repeatedly, following St. Pierre's (2011) guidance: "to read, and analysis, whatever it is, will follow" (p. 622). All of these materials together formed part of the textual account of the research and I considered them, and my recording of them, to be integral to the research assemblage as a whole. As St. Pierre (2011) writes, "it is impossible to disentangle *data, data collection, and data analysis*" (p. 622, emphasis in original).

Second, the supervision team were invited to review excerpts of the transcripts and to engage with my analysis of these textual accounts. In addition, as the analysis progressed, I engaged in discussions with colleagues and presented emerging insights to

other researchers, a strategy which provided valuable opportunities to broaden my understanding. Above all, my fieldwork diary was used on a daily basis as a means of engaging in critical reflection on the research process, maintaining a constant link between the research and my participation in it and providing a record of the significant effects that I might have therein. This continuous tidal flow of observation and reflection was enrolled so that I might seek more nuanced ways of engaging meaningfully with the participants in the interviews in order to obtain a deeper understanding of their teaching practices.

In aiming to preserve this meaningful engagement with the nurse educators, I met with each of them for a second time, when the analysis process was nearing its end, to present them with some of the emergent insights relating to their practices and to allow them to engage in a discussion to reflect and provide feedback on my work. The materials that were generated in these encounters were invaluable in shaping my own understandings of the implications of these insights, and excerpts from these conversations are woven into the discussion presented in Chapter 7.

Telling the stories of nurse education

> *Stories are the highest technology of being.*
>
> From *The Mystery Feast,* by Ben Okri, 2015

In telling the stories of nurse educators in simulation teaching spaces, I want to describe how simulation education is *performed*. In accordance with the principles of ANT, my aim is to map as many details about these practices as possible, but, more importantly, to disentangle the connections that make up the assemblage of simulated human patients and teaching about nursing practice. However, the idea of *performativity* in simulation education has a *doppelgänger*: all teaching practices encompass some element of performance, but in simulation education this is doubly so. In simulation education, in teaching about practices, all of these practices are also pretend – they are performed in a specific way that is both distant from yet connected to nursing practice. In performing simulation education, the metaphor of a theatre performance might be mobilised. However, in being guided by ANT, this performativity is not confined to the human actors, but applies also to the material artefacts – the performative effects, or how

objects are *enacted* in practices (Mol, 2002). Through my analysis, I have chosen to tell the stories of three objects-as-practices: the mannequin; performance; and the nomadic. These are stories about the objects-as-practices that assemble to enact simulation education.

In addition, throughout the analysis I shall argue that, in attempting to resist the binary opposition of the subject/object divide (Mol, 2002), the uncanny double of simulation education is made visible in multiple ways. As Mol (2002) suggests, wherever such a dichotomy is resisted "there are at least two subject/object divisions at stake" (p. 33). She argues that resisting the division between the subject/humans and objects/nature divide always includes "a related but different division between actively knowing subjects and passive objects-that-are-known" (p. 33). In other words, any act of resisting this dichotomy reveals a dyad. However, I shall also attempt to show how, in simulation education, this dyad becomes further doubled – it becomes multiple. In choosing ANT to navigate the assemblage of human patient simulation education, and in drawing on Law's (2004) notion of "*method assemblage*" (p. 84), the objects enacted in practices are themselves doubled – simulation education itself, as the *manifest absence* of nursing practice, I suggest, is also its uncanny Other.

In presenting the analysis, I shall first present the mannequin as an object-as-practice, as it occupies a central position, both physically, in each simulation scenario, and allegorically, as its practices are pivotal in being entangled in multiple sociomaterial relations of the simulation pedagogies (Chapter 4). Second, and linked to the mannequin, I present the performativity of the simulation education assemblage, which encompasses pretending, theatricality, and play, as multiple translations that emerge within the assemblage (Chapter 5). Third, I shall move to present more specific objects-as-practice embodied within these allegorical translations to reveal how some objects-as-practice are nomadic: these objects are not fixed, they can move fluidly "between different practices in different sites" (Law, 2004, p. 79), while at the same time, shifting in shape and name. In so doing, they reveal how, by being engaged in the *distribution* and *movement* of nursing practice, they are enacted as multiple realities in the multiple worlds of simulation education and nursing practice (Chapter 6). Throughout the reporting of this praxiography, and in being guided by the tenets of ANT, I endeavour to be a sympathetic storyteller, to "let the actors have some room to express themselves"

(Latour, 2005, p. 142), and thereby allow the objects-as-practices to emerge from the periphery to join the assemblage in this co-production of research knowledge.

Each of the heterogeneous materials that were co-produced in the research assemblage have themselves been assembled together here to tell the story of simulation in nursing education. As each of the various materials came together to enact these stories, they interfered with my storytelling practices; however, each depended on the other – just as they interfered with my practices, so I interfered with theirs. The complexity of these entanglements creates possibilities for new modes of knowing to emerge. As Mol (2002) writes:

> This is what makes a praxiographic analysis so complex: that no entity can innocently stay the same throughout the story, unaltered between various sites. There are no invariable variables. There is interdependence and, where two or three modes of ordering, two or three ways of enacting a specific object meet: there is interference, too. What becomes of objects when practices interfere with one another? (p. 121)

The next three chapters explore this very question as I respond to my own research questions.

Chapter 4

Anansi: The mannequin as shape-shifter trickster

> *In ancient Africa, in Celtic lands, storytellers were magicians. They were initiates. They understood the underlying nature of reality, its hidden forces.*
>
> From *The Mystery Feast*, by Ben Okri, 2015

> *The truth about stories is that that's all we are.*
>
> From *The Truth about Stories*, by Thomas King, 2003

The previous chapter set out the ways in which I enacted the research practices for this thesis. This chapter presents the first of three chapters that tell the stories of the two nurse educators and the simulated humans they enrol. These stories describe the teaching practices that are being enacted in the simulation lab and how they are being embodied by the actants: trickster storytelling; performativity and theatre; and fluid and nomadic practices. These practices are presented in a series of posthuman anecdotes (Adams & Thompson, 2016) that act as exemplars to make visible the hidden challenges and tensions within this teaching and learning assemblage and to reveal how the actants address them. In this chapter, I shall explore the trickster storytelling practices, but first, I present a description of the mannequin to illustrate how this object-as-practice is implicit in embodying the teaching practices of the nurse educators.

The mannequin and interferences

In the simulated ward, the SimMan™ mannequin lies on a hospital bed, its head propped up on pillows, and its body covered with a sheet and hospital blanket. The mannequin is usually powered up and a pre-programmed scenario, instructing the mannequin's mechanisms for breathing, pulse rate, and blinking, is running on the accompanying laptop when the students arrive. This particular model of SimMan™ is

wireless – it is powered by the mains electricity supply, but the software that controls its physiological signs is located in the laptop, which is sitting on a desk in the control room, adjacent. The mannequin simulates breathing – the chest moves up and down, and the eyes occasionally blink. These physiological signs are being generated by multiple actors in the assemblage that is the simulation lab: SimMan™ is connected wirelessly to the laptop that houses the software that sends signals to its mechanical components to replicate them. The software is designed with pre-set algorithms that will generate an array of physical cues to simulate a set of possible scenarios, for example, the signs associated with myocardial infarction, cardiac arrest, anaphylactic shock, hypoglycaemia, or epileptic fits. The mannequin can also be connected to a monitor mounted on the wall beside the bed that displays those signs. The educator controls the software from the laptop, monitoring the mannequin to ensure that the mechanical parts are performing as the software is instructing them to. The mannequin usually wears an identification wrist band that the educator has placed there, indicating the patient's gender, date of birth, name, and unique NHS identification number. Each of these objects-as-practice works to mobilise the enactments of simulating the human body in the mannequin. However, as they engage in these enactments, each exists only as a *mediator* (Latour, 2005, p. 108) between other objects-as-practice that are absent: the software designers who wrote the code for SimMan™'s algorithms; the engineers who designed the mannequin's shape, structure and components; the technicians who assembled the mannequin; the electricity supply and the wires that transport power to the lab; the nursing curriculum, determined by the University, which will guide which algorithms the educator will choose to run – this teaching and learning network of objects-as-practice is complex and potentially infinite.

Already, as a starting point for following the actor (Latour, 2005), the mannequin is enacting multiple practices: those that are both present and absent. For example, today the mannequin has been provided with the identity of a patient who is absent from the physical space. The educator has chosen a specific character for the mannequin to 'play'; SimMan™ will embody the physiological characteristics and clinical symptoms of a sheep farmer named Malcolm from New Zealand. The mannequin, in becoming-Malcolm, shares the same date of birth, the same medical history, the same clinical diagnosis, the same family members – even the same name. The stories that form the history of this absent patient are not simulated – these are the details of a patient who is

affected by cardiac disease: Malcolm the sheep farmer. In attempting to make the scenarios as realistic as possible, the stories that are being drawn upon here have been 'donated' by patients in clinical practice. In the same way that one might leave one's body 'to science', this sheep farmer has agreed that his medical story can be used to teach nurses about caring for people by providing his background history, thus making the simulated scenario seem to be more realistic. Here is another example of absence made manifest – in the simulated ward, Malcolm becomes SimMan™-as-Malcolm; or SimMan™-becoming-Malcolm.

All of the students in this cohort are already familiar with Malcolm. They have watched video recordings of him in consultations with his doctor. They have reviewed his medical records and have had group discussions about his prognosis and prescribed care to aid in forming an understanding of his condition. They are therefore familiar with his history; both medical and personal, and they have formed an imaginary connection with him within their professional practice knowledge. By the time the students arrive in the simulated ward to read the briefing note about the scenario, they have already formed an understanding of Malcolm's being-in-the-world as a patient. They have made certain ontological and/or epistemological connections within this assemblage: they know that he has been treated for a heart attack in the past, and that he has had surgical intervention to repair the damage. As they encounter the mannequin and come face-to-face with SimMan™-as-Malcolm, however, the sociomaterial practices of the mannequin begin to erode these connections. They seem to accept that SimMan™ is the familiar patient, Malcolm, but they also seem to be unfamiliar with him. SimMan™ looks nothing like Malcolm does in the video, but, in preparing for these scenarios, the students have been asked to review the medical histories and consultation videos of several patients and they should be able to make a direct link between their preparation tasks and these scenarios. Despite having prepared for weeks, when confronted by SimMan™-as-Malcolm they seem reluctant to engage with the scenario, enacting what appears to be a form of stage fright when they first approach the mannequin.

Now there are gaps appearing in the assemblage: Malcolm the patient and SimMan™-becoming-Malcolm is a familiar yet strangely unfamiliar connection; he is an uncanny presence. As such, the students often seem confused about how to approach the scenario. They seem unsure about whether they should draw on this previous

knowledge of Malcolm, and usually begin the scenario by ignoring their preparatory activities altogether. This uncertainty seems to disrupt the story and the students struggle to make the connections between SimMan™ and the learning materials relating to Malcolm. Thus, SimMan™, despite embodying the sociomaterial practices of becoming-Malcolm, is not able to tell the full story of Malcolm, who has, for this scenario, been admitted to the ward with chest pain. At the same time, the additional layer of uncanniness embodied by the mannequin is further interfering with the assumed aim of the simulation assemblage: to replicate the world of nursing practice in a realistic way. So, what does the nurse educator do in response to this disruption?

The mannequin/nurse educator cyborg as patient

Now it is the nurse educator's sociomaterial practices that engage in the assemblage to stabilise these precarious and uncanny connections. Each session begins in the same way. A group of eight students arrive in the control room (Figure 4) and are welcomed by the nurse educator, John. They quickly tend to the administrative task of signing the register, and then John asks for two 'volunteers' to perform the first scenario.

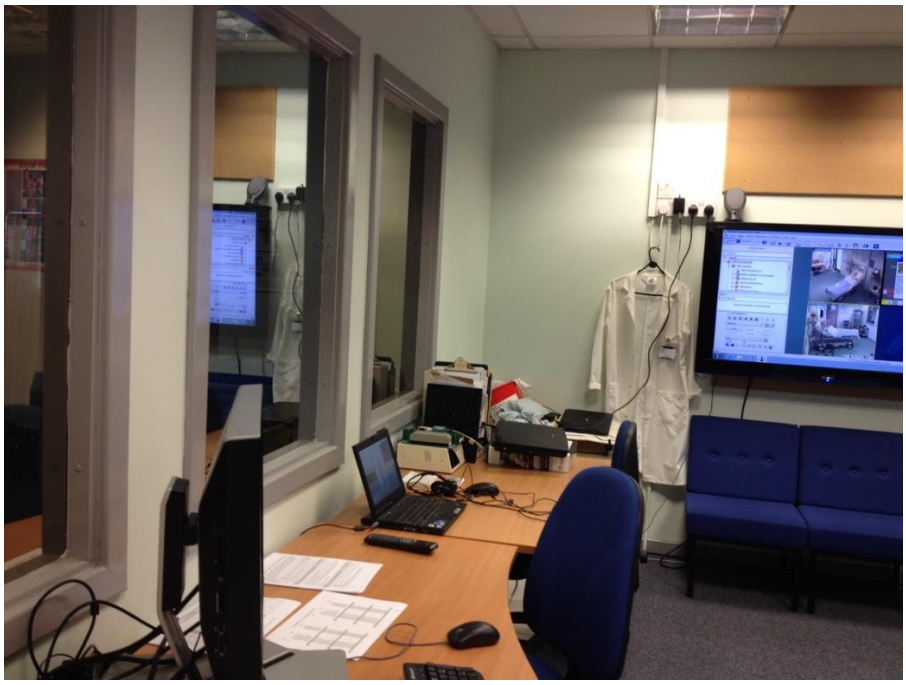

Figure 4: The control room

John takes the two volunteer students into the simulated ward and briefly sets the scene. He instructs the students to first "wash your hands, put an apron on, go and read the brief." The "brief" is a description of the scenario, appearing as a pop-up window on

the monitor beside the patient's bed. John explains that this patient is Malcolm McQueen, and reminds them that they should know him from the patient information database that they have been studying over the past semester. He explains that everything they need is in the room, and that he will be speaking to them from the control room through speakers. He tells them that the mannequin does have speakers just behind his ears that can be used to relay information from the control room, but that they are causing feedback disturbance (interference), so he will instead use the speakers that are connected to the mobile Smots™ cameras (Figure 5) that are used for instant playback of the scenario in the control room.

Figure 5: A mobile Smots™ camera housing a speaker and microphone linked via closed-circuit to the control room

He tells them that they can "do everything apart from his temperature", but that if they put the thermometer in the mannequin's ear, he will "shout it through" the speakers. He tells them that he wants them to "do the blood pressure manually the first time, and after

that it'll come up on the screen." He explains how to use the SBAR (situation, background, assessment, recommendation) form beside the telephone to remind them what information they should gather before they relay it to anyone; "If you're phoning out, please phone switchboard and nobody else, if you can use SBAR when you speak to anybody – you don't have to actually write on it, but just use it as a script. Okay?" Finally, before he leaves the room, he tells them, "And that's you … anything you want to know, you ask the patient, or ring" (John, September 29, Session 1). While the mannequin will here perform multiple enactments, it also embodies all of the information about Malcolm that is held in the database; the videos, the medical records, his personal history, thus allowing these objects-as-practice to become manifest. At the same time, the mannequin is enacting the teaching practices of the educator, who is physically absent from the room. Speakers located just below the mannequin's ears are usually employed to relay information and (re)enact the familiar information about Malcolm, but these interfere with John's practices, so he defers the voice away from the mannequin and instead the voice of the educator-as-patient emanates from the roving Smots™ cameras set up to record the scenario and relay the activities of the students to those situated in the control room. The mannequin, therefore, is at the same time enacting the presence of John, while also enacting his manifest absence.

After instructing the students, John leaves the ward room and returns to the control room where the rest of the students are observing the scenario. While the students read the briefing note on the patient observation monitor, John sits in an operator's chair facing the windows overlooking the simulated ward. On the desk in front of him is a PC with a monitor that is connected to the Smots™ system. Attached to the PC is a headset with headphones and a microphone, which John places on his head. This microphone will be used to enact the voice of the patient, and John can turn it off and on using the mouse to control its application on the Smots™ software. The mouse can also be used to control any one of the four cameras that are placed in different corners of the room and on the ceiling – he can zoom in/out and the cameras can be rotated by using the mouse. Also displayed on the PC monitor is the same information that appears on the patient monitor in the ward room. This PC is used to choose which images to display on a larger monitor on the wall of the control room that the observing students can view. The observing students can watch the scenario through the windows, or they can view the Smots™ camera footage on a large screen mounted on the control room

wall. A laptop also sits on the desk. This laptop houses the software that controls SimMan™. It has its own display and mouse, and does have the function to control the speakers located on the mannequin's head, but John uses it only to control SimMan™'s mechanical algorithms. Also sitting on the desk is a telephone, which John uses to speak to the students when the simulation scenario is running. He might call them to relay information that they are missing about the patient, or the students might call to relay information about the patient, or ask for assistance, such as requesting assistance from various other professionals in the hospital (Figure 6).

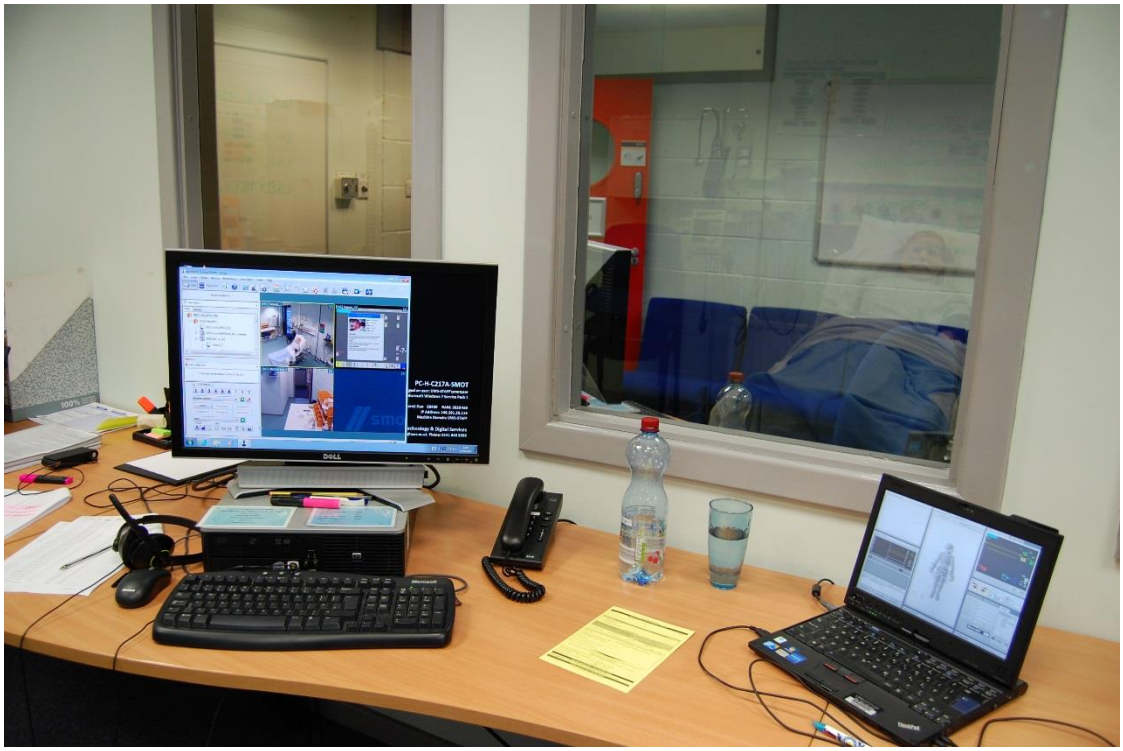

Figure 6: The control room desk with Smots™ software on the PC and SimMan™'s software on the laptop

After reading the briefing note, the students turn to speak to the mannequin, and one asks, "Hi, Malcolm, how are you?" John activates the microphone on his headset and begins to enact the voice of Malcolm, the patient, and SimMan™-becoming-Malcolm: "[Groaning] Ohhhhh, hello Nurse. I'm not very well, I'm in awful pain." The dialogue between the two nurses and SimMan™-becoming-Malcolm continues:

Paula:	Oh well, my name's Paula …
Malcolm:	Oh, right.
Paula:	I'm a student nurse and I'm going to be looking after you today, okay?

Malcolm: Okay, that's fine.

Paula: So, where's your pain?

Malcolm: It's in my chest, but it's going up and down my arm and up into my jaw. I had some GTN in the ambulance, but it didn't work.

Paula: It didn't work?

Malcolm: No.

Paula: Okay, is it okay if I take some observations?

Malcolm: Oh, by all means. I just want to get rid of this pain and phone my wife.

Paula: We'll do the best we can to make you comfortable, okay?

Malcolm: Thank you.

(John, September 29, Session 1)

This excerpt demonstrates how the mannequin is not able to embody the practice of becoming-Malcolm without the manipulation of these practices by John. By enacting the voice of Malcolm, John is providing a scaffolding between physically absent Malcolm and Sim-Man-becoming-Malcolm that the mannequin cannot. While the mannequin can be programmed with pre-recorded sounds, such as coughing, vomiting, or choking sounds, or even 'standard' recorded responses to the students' questions, it is not able to respond as a human patient would, in the form of a conversation. This is one part of the scenario that SimMan™ cannot simulate, but which is integral to a critical element of nursing care – the vocal interaction between the nurse and the patient. Here the practices of the educator, mannequin, Smots™ camera and control room equipment become co-producers of what the mannequin is doing in the scenario. Using the simulation materials, John becomes a hybrid cyborg of patient, mannequin, speaker, storyteller, and educator to guide the students through the story. In addition, Sim-Man-becoming-Malcolm is performing certain practices that a patient cannot. For example, while John is indicating that Malcolm "has been in here before", his enactment of the patient's voice and knowledge, in his hybrid assemblage with the mannequin, is mobilising the knowledge that the students need to navigate the scenario. He is instructing them to "just get rid of the pain" and "call my wife", all cues for what they ought to be doing to care for the patient within the bounds of professional standards of nursing practice.

In enacting the voice of the patient, John is making manifest the absent patient, but he is also making manifest a second actant: nursing practice. In performing the voice of the patient, John is providing cues about what the students should be doing, using words that a patient might. Furthermore, in describing the pain that Malcolm is experiencing, he is giving them clues about future possibilities: that Malcolm may be about to experience another myocardial infarction. In this way he is also enacting the future experiences that the students may encounter in their nursing practice after they qualify, making manifest the absent and imaginary experiences that they have yet to encounter. As such, the cyborg of the mannequin/educator/Malcolm is thus a hybrid *mediator* in the assemblage of simulation learning and nursing practice.

In enlisting these hybrid practices, John, in becoming-patient/mannequin cyborg, is enacting the practice of allegory, telling "a story that uses symbols to convey a hidden or ulterior meaning" (OED, 2019). Law (2004), drawing on Haraway's (1991) metaphor of the cyborg, writes:

> Cyborgs, then, are sets of partial connections. These may present themselves as political. They may present themselves as material (between machine and human, or between human and animal) … they may present themselves as lying somewhere between reality and fiction. For, another visual metaphor, cyborgs are about interfering in the distributions between reality and fiction. (Law, 2004, p. 69)

As illustrated in Chapter 2, for Law (2004), allegory is about "the movement between realities" (p. 108). Allegory is also about what happens in the spaces between "the manifestation of entities, the real, on the one hand and the enactment of the non-real, of silence, of Otherness, on the other" (p. 108). But Law (2004) also suggests that allegory is about allowing these multiple realities to hang together. The simulation scenarios can also be seen as being about interfering in the distributions between reality and fiction. The practices of the educator-becoming-patient/mannequin cyborg, then, are engaging in the telling of allegorical stories that move between the multiple enactments of the realistic and the pretend, allowing these objects-as-practice to become durable. In this example of John's teaching practices, he is enacting a hybrid set of partial connections between the boundaries of nursing practice and simulation education; one that acts as a powerful *mediator* between the reality of caring for human patients and the fiction of

simulated human beings. At the same time, this allegorical story also signifies the more important story of the reality of 'good practice'.

Haraway (1991) enlists the trope of the cyborg to explore socialist-feminist ideologies, but here the SimMan™/John cyborg is more-than-trope: it is an assemblage of multiple ontologies enacted in the practices of both the mannequin and the educator. The fluidity of the simulation education space allows the mannequin to occupy more than one reality; that of the mannequin, that of the sheep farmer patient, that of the educator, and that of a generalised notion of 'good practice'. Here the practices are at the same time present, yet absent, and further, they are all part of the same assemblage – they hang together as part of one another. However, as Mol (2002), proposes, these objects-as-practice have complex relations; the mannequin does not contain the patient and the mannequin does not contain the educator – they "do not encompass each other: they are, rather, situated *side by side*" (p. 149).

Haraway (1991) provides a useful way of thinking about the complex relations of the social/material hybridities that are embodied in the educator-as-SimMan™-becoming-patient in her 'Cyborg Manifesto':

> No objects, spaces, or bodies are sacred in themselves; any component can be interfaced with any other if the proper standard, the proper code, can be constructed for processing signals in a common language. (p. 163)

This way of thinking about the hybrid relations that take place in simulation education implies that the educators, in a sense, are interfacing with the mannequins in a common language, or material semiotics, that tells the stories of multiple realities: the reality of the patient, Malcolm; the scenario in which the students are performing and learning; the limits of the professional code of nursing practice; and the materiality of the mannequin. The practices of the mannequin cannot stand alone. Without the educator-as-SimMan™-becoming-patient hybrid, the whole story of nursing practice cannot be told; the patient is thus embodied by, and his story is enacted in, the sociomaterial conversations that fill in the gaps in the narrative that would otherwise cause the assemblage to fall apart.

The practices that Malcolm enacted as a patient in New Zealand are now being simulated in the enactments of the hybrid connections between the educator-as-SimMan™-becoming-patient, in an assemblage of videos, medical records, algorithms, laptops, monitors, wireless networks, and in being cared for by the students. But it is the practices of the educator that allow these connections to stabilise and become durable. Just as Malcolm is being enacted in the practices that perform SimMan™, so is SimMan™ engaged in an assemblage of becoming-Malcolm.

And yet, the absent Malcolm, the sheep farmer, the one who had agreed to allow student nurses to enact their own practices in caring for him as he is enacted in SimMan™, has since died. He is no longer alive; his being-in-the-world no longer exists. However, in the material relations between his videos, his medical records, the narrative stories in the teaching materials, and in the repeated (re)enactments of his story by the mannequin/educator/Malcolm cyborg, he is still part of the assemblage. The modes of knowing that this assemblage of practices have mobilised in the scenarios continue to act within the network, thus they are still embodied in the relations between the hybrid objects enacted in the complex practices of simulation education. Despite being doubly *absent*, located physically elsewhere *and* ceasing to exist in the reality he occupied when the videos were made, Malcolm continues to be *present* and to participate in this assemblage, influencing the relations that bind together to mediate the modes of knowing that emerge.

Thus, the (re)enactments of Malcolm's story become what might be called a simulacrum. Malcolm's double haunts the scenarios by being a simulation of an uncanny presence that cannot be replicated because it does not exist. Yet he continues to influence the teaching and learning practices in this space. These practices, as an assemblage of Malcolm's "false double" (Puchner, 2004, p. 12), by acting as a mediator between SimMan™ and his multiple representations (Mol, 2002, p. 155), and in enacting the mobilisation of knowledge in this network, have become durable and are sustained. To reiterate, SimMan™, therefore, is an object that is enrolled in a mode of knowing that Law (2004) refers to as method assemblage: "the enactment of *presence*, *manifest absence*, and *absence* as *Otherness*" (p. 84).

Narratives as scaffolding

In simulation education, enactments that cannot be simulated are instead replicated in narrative. Most of the students in my observations had not yet practised immediate life support skills on the computerised high-fidelity mannequins. In their previous skills lab sessions, they might have practised giving injections or drawing blood on a simulated arm, or they might have practised artificial resuscitation and CPR compressions on Resusci-Anne™. They will have learned about anatomy and physiology by taking apart plastic models of sections of the human body. However, these are their first encounters with life-size computerised simulated humans. The students in both nursing schools were, at first, reluctant to engage with the mannequin. Every so often, the educators encounter a student who finds the whole notion of the simulated human patient too unnerving to take part in the scenarios. Both participants gave examples of extreme situations where these uncanny disturbances caused disruptions in their teaching practices. For example, in his interview, John described how one student "didn't want to go in at all and was totally anti-[mannequin]." He explained how he approached this disruption:

> I sat and spoke to her, I said, "Is this a bit like fear of flying? People who have never been on a plane?" She said, "Well, it's just a feeling." I said, "First of all, are you allergic to anything?" She said, "No, it's not an allergy, it's just the mannequin lying in the bed."
>
> (John, Interview 1)

The sense of unease described by the students in these encounters can be attributed to their entering what roboticist Masahiro Mori (1970/2012) proposed as the "uncanny valley"; the idea that any simulated human form is inherently disturbing, but that it comes increasingly so when it is made to appear too realistic. People will react positively to simulations of living human forms, even eliciting empathy and a willingness to be comforted by them (Strait et al., 2017). However, this acceptance will only go so far. Once the simulated human becomes too realistic, so that it becomes indistinguishable from a 'real' human, it becomes too disturbing and an individual's willingness to accept the facsimile drops quickly into the 'uncanny valley'. This is ironic, as the aim of simulating human patients is to make them appear as realistic as possible. In my observations, the students were always reluctant to volunteer to take

part in the scenarios at first, and many made comments describing the mannequin as being 'creepy' or saying that it 'freaks me out'. The way in which the students are first dubious about approaching the scenarios, and the mannequin in particular, indicates that they initially find the mannequin too realistic for them to suspend their disbelief, forcing them over the edge and into the uncanny valley.

The effect of the uncanny on the students is twofold: not only does the realness of the mannequin contribute to this sense of unease, but the simulated ward itself is a strange, uncanny land; at the same time familiar, yet disturbingly unfamiliar. This object-as-practice of the uncanny creates a tension between the whole point of simulating human patients to be as realistic as possible, and the ways in which the students engage with the sociomaterial in the simulated ward. For example, the students often describe how their performance of the skills in this space is unnatural: "normally I would just do it" (George, Observation notes, 27 March), or "I wouldn't do it like this for real on the ward" (John, Observation notes, 8 February). However, the educators insist that they should "just do it, then" (George, Observation notes, 6 March), or to "just do what you would do on the ward" (John, Observation notes, 8 February, Session 3), and the students are encouraged to "pretend that you are on the ward" (John, Observation notes 13 October). At the same time, the educators understand and acknowledge that the students are "out of their comfort zone" (John, Interview 1) and that the simulated ward is an uncanny place.

In contrast to John's practices, George adopts a different approach to his teaching practices. Instead of teaching from the control room, George situates himself in the simulated ward room while the scenarios are performed. While he uses the same model of SimMan™, with the same software configuration to control the mannequin's functions, George brings the laptop into the simulated ward and places it on a counter, managing the scenario without leaving the room. However, in the same way as John does, George enrols the practice of storytelling, embodying the narratives of nursing practice in his assemblage with the mannequin/patient to pull the students out of their uneasiness and prevent them from tumbling into the uncanny valley. Instead of presenting the students with a patient/mannequin with whom they are already familiar, George begins the scenarios by asking each student to say a bit about where they have last been on practice placement and where their next placement will be. Although

George has prepared a scenario that should include a pre-determined set of symptoms and actions for the students to encounter, he uses these introductory narratives about the students' experiences to tailor the particular identity that SimMan™-becoming-patient will enact for this specific group of students. For example, between groups of students, the setting might change – from an A&E department to the ICU ward, to a palliative care ward – and the characteristics of the patient might change from scenario to scenario. Instead of enrolling the Smots™ cameras to enact the voice of SimMan™-becoming-patient, George uses his own voice, but modifying it, so that it is easy for the students to recognise that he is enacting the voice of the mannequin/patient:

George: This is Bob. Bob is 62 years old, and Bob developed chest pain this morning. Here he is. Okay? What do you want to do with him?

[The students look at each other and giggle quietly.]

George: Stunned silence!

[Laughter]

George: I know he's a piece of plastic, but, by the end of the day, you're going to do everything in your capability to look after a piece of plastic. So, talk to him.

[The students still stand next to the mannequin, looking at each other, silent.]

George: Gosh! You're terribly shy, aren't you?

[Laughter]

Milly: Bob, can you tell us where your pain is, please?

George/Bob: "In my chest." [Panting]

Milly: Do you have any pain in your jaw? Or is it moving down your arm or anywhere?

George/Bob: "No, it's right in the centre of my chest. [Panting]. It feels really heavy."

Milly: Okay, do you mind if we just take some observations so we can see what's going on?

George/Bob: "Be my guest!"

(George, 6 March, Session 1)

Adopting this strategy forms a connection between the students' familiarity with practice and the unfamiliarity of the simulated ward, which resolves some of the tensions caused by the uncanniness of the mannequin and reduces the 'creepiness' of the encounter with SimMan™-becoming-patient. Drawing on their past practice histories and their possible future experiences in this way, George forms a hybrid scenario that straddles both spaces: using his storytelling practices, he modifies the scenario to situate the enactments within a hybrid assemblage of both a past reality and a potential future reality. In this sense, he is enacting multiple stories of nursing practice. He then uses modifications to his own voice to enact the patient's speech, disrupting the otherwise silent practices of the mannequin, to introduce the students to the patient. This also signals to the students that the educator is enacting multiple roles within the scenario, including the voice of the patient/mannequin cyborg, and provides a way for them to distinguish between these characters in the scenario.

This practice of narrating is also multiple. Interlinked with this 'patient voice', George uses a contrasting softer tone and speaks more slowly when he describes what the students will be expected to do. In the elicitation interview with George, we watched a video clip of this oscillation between educator-as-patient and educator-as-teacher, and I asked him to tell me more about this practice of using different voices in his teaching:

> I'm trying to put them at ease, you know, by introductions as usual, and trying to find out a little bit about what they've experienced I think is important. Trying to welcome them, I'm trying to have control, set the boundaries of teacher and student, obviously, but trying to do it in a, a very non-threatening kind of way, and that's important because they are spooked by the environment, it's quite a common thread I think that, you probably already know this that they don't have an awful lot of experience in working with this kind of kit, and there's the whole suspension of disbelief and, and, and all of these aspects, so I think it's important for me to verbally acknowledge that they do find it uncomfortable and do find it strange, because there was a time I felt it strange, and you know, I'm in a position where I've

> been taught using these kinds of technologies and now I teach using them, so it's important that they know that I know how they feel.
>
> (George, Interview 1)

By acknowledging the uncanniness of the space and the mannequin, and of the ambiguous nature of the artefacts that reside there, George allows the students some freedom to explore the uncertainty that they are feeling. In using his voice, however, he is also disrupting the mannequin's practices to add further layers to the educator/mannequin/patient assemblage. In bestowing a human voice upon the mannequin, the educator provides a narrative scaffolding between the seemingly voiceless figure of the mannequin and the imagined scenario of the patient in the ward in practice. Mol (2002) describes how such "interferences between the enactments of two or three multiple objects" (p. 151) are what allow the co-existence of multiple realities. In simulation education, these storytelling practices contribute to making the relations between the objects more stable, and to allowing these multiple material worlds to hang together (as described in Chapters 1 and 2).

At the start of each new session, George explains what the mannequin can and cannot do in relation to the task at hand. For example, here he explains what will happen to the mannequin when the shock is delivered by the automated external defibrillator machine (AED):

> Now the mannequin won't do what real people do, real people will give a bit of a jump … because you're passing an electric current through their muscles, so all their muscles will contract because of the electric impulse and then relax again, so we can't mimic that with these mannequins. (George, 6 March, Session 3)

Here, George is describing the limitations of the simulation, but he is also describing what would happen to a human patient should they be shocked by the defibrillator. In the sessions, the shocks that the students give to the mannequin are not simulated, and the defibrillator machines are not simulated; only the electrical wires leading to the mannequin are modified so that they can be clipped on to the terminals, similar to those of a car battery, that are attached to the mannequin's torso for the purpose of simulation. However, having no muscles to contract, the mannequin does not move at all when the

very brief shock of electricity passes through it. By describing to the students what they should be seeing the patient do, George is telling a story about the patient's practices to allow them to use their imaginations (and sometimes their previous experiences of practice placements) to fill in the gaps in their knowledge; using storytelling as "imaginary work" (Hopwood, 2017, p. 73), mobilising "fictional spaces" (Bligh & Bleakley, 2006, p. 608) to enact this scaffolding effect. George guides them through these "blind spots" (Law, 2016, p. 21), using his expertise as a storyteller to allow the students to understand the gaps in practice that SimMan™ cannot fill.

The educator as trickster

In simulation education, the telling of stories is important, because this practice engages the imagination to connect with nursing practice to bridge these gaps in the students' knowledge. However, an additional disruption that I observed is that the students seem to assume that the simulated learning space is purposively set out to deceive or mislead them so as to test their ability to identify specific practices that must be undertaken to resolve an underlying issue. This example below illustrates how the students seem to approach the scenarios with the assumption that they are being tested with 'tricks'.

In one simulation, four students are gathered around the mannequin, who is enacting the role of a patient who has gone into cardiac arrest. One student performs chest compressions, counting quietly to herself, raising her voice when she nears 10 compressions to indicate that the second student should inflate the air-bag-mask. A third student holds the mask tightly to the mannequin's face. A fourth has connected the electrodes from the AED to the mannequin's chest and the machine has been activated. They continue to practise CPR on the mannequin. Each time the AED checks the mannequin for a shockable heart rhythm, the automated voice recording on the AED machine responds, "No shock advised. Continue CPR." The students continue for ten minutes. After five cycles, George begins to tell the story of the patient – he is a man in his late 80s, who lives at home alone, and has experienced a cardiac arrest while in hospital to be treated for a broken hip. He reads through the patient's notes. The man has a history of becoming increasingly agitated at home. After his wife died, he would quite often wander around outside in the street at night and not remember where he was. He would become distressed if anyone approached him and was verbally aggressive. He then had a fall and broke his hip and was hospitalised. The

hip was successfully treated, but his rehabilitation has been slow as he has been reluctant to complete the exercises. He had a suspected urinary tract infection and has had several invasive screening procedures performed. He can walk with the assistance of a Zimmer frame, but the staff are concerned that he is not going to cope at home on his own and are beginning to think more about long-term care for him. As the educator continues his story, one of the students is worried that they might be hurting the patient, and asks:

> Paula: Is this appropriate to what we're doing right now?
> George: This … what? Yeah!
> Paula: I thought that was maybe, like, what we were meant to pick up on.
> George: Well, I wouldn't be telling you it if it wasn't appropriate.
> Paula: I just thought you were trying to trick us.
>
> (George, 24 March, Session 1)

The process of performing CPR is a very violent act – the student is worried that they are harming the patient. At the same time, the student is suspicious of the educator when he begins to tell them more about the patient's background – are they being tricked into performing CPR when it might be an inappropriate treatment? Importantly, the student's suspicion reveals a hidden link between the storytelling practices and her learning. George is telling this story to influence the students to form an understanding about the person they are treating and to encourage them to make their own decisions about the practices that they are expected to enact, based on the information that is hidden in the simulated space. In practice, they would be familiar with this patient and his medical and personal history, but here, in the simulated ward, this information is concealed and cannot be surrendered by the mannequin. As such, the students often seem to encounter the scenarios as a mystery or riddle to be solved, heightening the notion that each scenario might encompass some sort of 'trick question'.

Ironically, the educators often suggest to the students that it is the patient who is a trickster, in that they present themselves to the clinical space with multiple mysteries that the nurses must solve. The educators often tell the students that "patients are sneaky" (George, 7 March, Session 4) and that they must not "trust" them completely, and that patients are usually hiding the cause of their symptoms and that it is their job as

a nurse to discover the underlying issues. In the simulations, the mannequin must enact this practice of concealing the "truth" about the patient's condition so that the students can decipher the puzzle and solve the riddle of correctly determining the patient's best possible treatment. However, it is the practice of storytelling that the educator enacts to convey these riddles *through* the practices of the mannequin. The mannequin, as a replicant, or as a false double, of a human patient, is already enacting trickster practices by embodying the "sneaky" patient. In addition, because the mannequin/educator cyborg is, by definition, attempting to engage the students in a game of pretending, it is also *enacting the practice of deception*. In the simulated ward environment, these practices seem to heighten the students' awareness that there might be an element of trickery involved. This is perhaps related to the uncanny nature of the mannequin itself, or perhaps, because there is an atmosphere of being tested in the simulations, there is an underlying assumption by the students that the educator is trying to "trick" them, despite their insistence that they are not. The educator both embraces and deflects these assumptions at the same time: patients and mannequins *are* sneaky, but I am not trying to trick you. While it is not clear where these assumptions originate, they seem to haunt each scenario in how the students relate to the stories that the educator is telling, as the students sometimes struggle to link the simulation practices with the objective of the lesson. The practice of storytelling then emerges to provide a fuller picture of the patient's background, and hence provide them with more pieces of the puzzle.

In this instance, when challenged by the students, George insists that he is not trying to trick them and continues telling the story of the patient. However, often the educators draw attention to these disruptive instances and use them to highlight important facets within their learning objectives. For example, when the students over-complicate their reactions to the simulation scenarios, George quickly reinforces the importance of remembering the steps that he is attempting to teach, and to "keep it simple" (Observation Notes, 6 December), emphasising that they must consider the solution to the riddle in a simple, systematic way to determine what might be causing the symptoms; "nothing fancy" (Observation Notes, 5 December). However, while George insists that he does not purposely set out to deceive the students, the stories that he tells about the patient are often allegorical (as described in Chapter 2). The patient's background is important for nurses to consider when they make decisions about which actions to take and to decipher the riddle of the appropriate practices that they must

enact to successfully treat the patient. While some of John's educator/mannequin/ Malcolm narratives are drawn from the patient histories database, George's stories are drawn from typical patient histories that he has encountered, either in his own experience or in stories about the experiences of other healthcare professionals that have been passed on in nursing practice folklore, or a hybrid of the two. Both participants indicated in their interviews that their narrative practices are drawn from encounters with what they refer to as "real patients":

> And this is all based on real – everything we do in here is based on real patients me and Janet [nurse educator] have seen.
>
> (John, Interview 1)

> It's a combination of what I've experienced as a nurse, as a clinician, and what I've learned from other instructors … I would say I probably rely predominantly on experiences with real patients, and I think that's important, because there's the linkage there to clinical practice.
>
> (George, Interview 1)

For both participants, then, the medical background of absent patients is made manifest in the practices of nursing simulation education. The purpose of the storytelling is to provide a scaffolding between the uncanny practices of simulation learning and the immediacy of nursing practice. But they are also allegories. They are replications of stories of past practice that become hybrid ghostly facsimiles, designed to mobilise particular knowledges by weaving stories that cleverly reveal a hidden significance. Abrams (1999) includes the literary genre of the trickster in his description of allegory, describing the practice as "a character in a story who persistently uses his wiliness, and gift of gab, to achieve his ends by outmanoeuvring or outwitting other characters" (p. 7). While the patient here might be considered the trickster character, and the hybrid educator/mannequin-becoming-patient cyborg embodies the role of the patient, it is the educator's storytelling practices that mobilise the mannequin's practices to enact the students' learning. It is the wiliness, eloquence, and artifices practised by the educator, as the author and performer of these stories, in his assemblage with the mannequin and all of the other objects-as-practice, that helps to build and sustain the hybrid of patient, mannequin and folk tale to mobilise knowledge in this simulated space.

Despite his insistence that he does not set out to deceive, George often uses the uncanny deception of the mannequin to embody particular mobilisations of knowledge within the scenarios. For example, when the students first encounter SimMan™, they are often unnerved by his seeming automatism – he seems to move of his own accord, as a sentient being would – particularly when they first notice that the chest moves up and down with his breathing, and that the mannequin blinks. They describe SimMan™ as 'creepy', 'freaky', and 'weird'. These actions are not biomechanical, however, they are generated by hidden connections between the mannequin, the air compressor, the mechanical parts concealed within the outer latex skin, the electrical cables providing the power supply, and the software that controls them together in an assemblage of simulating a human patient. Sometimes the students stray too far into the uncanny valley when they encounter these movements for the first time. These instances disrupt the scenarios, but the educator responds to these disturbances in a variety of ways. Sometimes he ignores them completely. Sometimes he draws attention to them. But, ironically, he always uses these interferences to his advantage: to "trick" the students into learning about the role of the mannequin in the embodiment of human patient practices.

In the elicitation interview with George, we are watching a video recording of a scenario. It is the first scenario of the day, and most of the students have used basic mannequins before, but never SimMan™. Three students have been asked to approach the patient and assess his condition while three others observe. George asks them to divide up the tasks of attending to the ABCDE (airways, breathing, circulation, disability, exposure) of observations. One student decides to measure the mannequin's respiratory rate by counting the number of breaths. She pulls down the sheet to expose the chest, moving the mannequin's arm closer to his body in a protective motion. Looking at the chest, the student recoils in shock with a sharp intake of breath, and her hands move protectively to her chest, "Oh my goodness!" she says, and she looks at George in horror; "He's breathing!" George calmly acknowledges that yes, he is breathing, but moves quickly on to continue to ask the students to think about what they should be doing next. I ask George how he copes with students who are disturbed by the uncanniness of the mannequins, and he responds:

> Yeah, it's important to acknowledge, I think, because … yeah, it is actually breathing, but I want more detail than that, and I quite like the goldfish bowl effect that you get with those that are waiting for their turn, and if the group who are engaged in the scenario are beginning to struggle I'll try to include the 'observers' if you like, by asking them what they think the group should do next, so … it's a wee bit of a sneaky strategy in a way because it focuses the guys who are around the mannequin to do some more, which is what I want them to do, but it also engages the others who are observing to notice that the mannequin is actually capable of doing quite a lot and mimicking what they may or may not see in practice, so it was a very basic acknowledgement; yeah, he's breathing.
>
> (George, Interview 1)

Here the mannequin is a shape-shifting trickster, telling stories of human patients by embodying their physiological actions in a form of persuasive mimicry, but the educator is also a trickster in employing the hybrid of uncanny mannequin and sneaky human patient to his advantage. Being implicit in this deception, George bolsters the abilities of the mannequin by acting as a mediator to mobilise the practice knowledge that is embodied by the mannequin. This is an important illustration of how the practices of the mannequin enact multiple worlds of practice; the practices of the simulated human patient, the educator's nursing practices, and the educator's teaching practices. At the same time, however, a double is revealed. The educator is teaching the students how the patient might behave in nursing practice, but at the same time, he is teaching them how the mannequin simulates this behaviour. The enactments occur both outside and inside of the simulation world at the same time; but in each world they are different.

While the trickster storytelling practices of George are mostly hidden, the practice of trickster storytelling is decidedly prominent in John's teaching practices. He takes great delight in testing the students' ability to pay attention to detail and to correctly assess and modify their own practices. In his scenarios, he often sets the scene to see whether he can "get them" (the students) with his trickery. For example, the students will know that these particular sessions include a patient who has had a previous heart attack, and, should their oxygen saturation levels drop, they should administer oxygen through a

mask. The oxygen is supplied through a portal on the wall at the head of the bed. However, there is also a portal for air, and one for suction. John will often connect the bag and mask to the air portal before the students arrive to determine whether they will notice and move the hose to the correct portal. He links this deception to the scenario by controlling the readings for the mannequin-as-patient's oxygen saturation on the monitor at the head of the bed. While the students administer the air, instead of oxygen, John continues to decrease the oxygen saturation readings for the patient on SimMan™'s software. If the students are not aware that the saturation levels are decreasing, he will use the patient's voice to give them clues about their error: "Oh, Nurse, I can hardly breathe. It's getting worse instead of better" (John, 9 February, Session 1). At the same time, in pantomime fashion, he lets the students in the control room in on the gag, some of whom shout, "It's behind you!" Sometimes the students participating in the scenario notice that the hose is on the wrong portal, and sometimes not.

But George does not restrict his trickster storytelling to disguising only his voice to engage in deceiving the students. Sometimes he emerges in the scenario in person, but in character; disguised. In one scenario, the patient, Malcolm, has deteriorated and gone into cardiac arrhythmia. Two of the students have started CPR and another two have been called in to assist. One of the students connects the AED to the mannequin and the automated voice recording advises that a shock should be given. Before the students administer the shock, they should first ensure that none of the other people in the room might be accidentally shocked by touching the bed. They must first visually check around the whole of the bed and then shout, "Stand clear!" before pressing the shock button. In this scenario, John is not satisfied that the student is practising safely, and this time he cannot employ the mannequin to relay the correct instructions as, in keeping with maintaining the realism of the scenario, the mannequin-as-patient is unconscious and therefore unable to speak. In addition, both the mannequin and the AED machine are disrupting the scenario, as the chest compressions performed by the students are causing the defibrillator wires to come loose from the mannequin's chest so that the AED cannot assess properly. To the delight of the students observing in the control room, John removes the headset, jumps up, and dons a white lab coat that hangs in the control room. "I'm going to get them," he says, rubbing his hands together, gleefully. He rushes into the simulated ward, explaining that he is Dr Carter, the

cardiologist. The students continue to perform CPR and set about their tasks, explaining to John that the defibrillator is not working properly. John-as-cardiologist moves towards the foot of the bed and helps to adjust the wire connectors to the AED as the next cycle comes to an end. The machine begins to assess the mannequin/patient, and John-as-cardiologist signals with his hand for the students to stand clear. Completing its assessment, the AED voice states, "Shock advised. Charging. Stay clear of patient. Deliver shock now." The student who is operating the AED immediately pushes the shock button without first checking around the bed or shouting, "Stand clear!" John immediately drops to the floor, as though shocked, lying face-down, motionless. The fall knocks his glasses off, which skid away along the floor. Staying in character, John makes no movement. One of the students begins to laugh, but two others move their hands over their faces in horror. For one very brief moment they all forget about the mannequin-as-patient, and two students abandon their posts and rush to attend to John, checking that he is breathing and that he has a pulse. This takes all of twenty seconds, but in that time the mannequin-as-patient has had no chest compressions or oxygen. Having established that John-as-cardiologist is unhurt, the students quickly organise themselves back into a team; three working with the mannequin, and one maintaining the pretence of the disruption in the scenario and calling the switchboard to ask for more help, saying; "I've shocked the doctor." After a few minutes, John-as-cardiologist stands up, he tells the students to carry on, and goes back into the control room. The students continue the scenario with great hilarity, discussing what went wrong, realising their mistake, and laughing in the relief that John was only trying to trick them (John, 9 February, Session 1).

It is important to note here that such trickster practices are not enacted in every simulation scenario – instead, these more startling incidences are enrolled only when doing so is appropriate and when the students are already familiar with the forms of the uncanny within the simulation space. For example, while John's performance here was completely ad-lib and unexpected, and while some educators may find these particular practices disturbing, this was the last-ever simulation session that this group of students would ever experience before completing their nursing qualifications. Both John and George explained to me in their interviews that these trickster practices were often seen as a rite of passage – traditionally, nursing students, on their last day of their final placement before qualifying, would expect to be tricked in some way to mark their

transition to nursing practice. While both acknowledged that what they had experienced in the past would now be unacceptable in professional nursing practice, incorporating these traditions within the final simulation scenarios seemed to serve as a similar acknowledgement of their successful transition from nursing student to qualified nurse. In addition, however, and more importantly, these remarkable incidents were also always powerful modes of knowing, where knowledge of valuable skills were mobilised and where strong memories of safe practice were embodied.

Afterwards, in the de-brief session in the control room, the students who were observing the scenario re-tell the story of the scenario to those who performed it. John takes them through the de-brief process of reflection: What happened? What went well? What did you do well? What could you have done better? What did you learn? During these de-brief sessions, the educators often deflect the humour of such incidents back to the sobriety of the lesson by telling similar stories from their past practice – a form of establishing the folk tales of nursing practice in which the knowledge from their past intermingles with the knowledge that has been mobilised in the scenario. In this way, the lecturer can be likened to the Anansi figure of oral history practices – he is the shape-shifting, storytelling trickster who holds the knowledge and reveals it to the students only through his stories. The same might be said of the mannequin – he is implicit in the practices of the educator. It is the complex, hybrid entanglements of relations between the practices of these actor-networks that provide the scaffolding to bridge these "blind spots"(Law, 2016, p. 21) of clinical practice that emerge in the simulation world.

The simulation scenarios themselves, with their performative nature, provide an atmosphere of theatrical expectation. The students have prepared for these sessions by reading the course materials beforehand, but they are not yet familiar with the uncanny world of simulation. The space is duplicitous – it is uncannily strange, and yet strangely familiar, and has the power to trick the students by embodying the double of a real ward. They are familiar with the way in which the space looks, with the material things that are housed there, but the unfamiliarity of the mannequin who occupies this space adds to the uncanniness. SimMan™ is a shape-shifter – he can become any form of patient that the educator desires; any gender, any age, any medical history; and he can take on any physical feature that the educator decrees. This uncertainty and atmosphere

of expectation that is generated in the scenarios is undoubtedly theatrical, and this actor in the assemblage has great influence on both the teaching practices of the lecturer, and the learning of the students. However, the most important features of the simulated patient, those embodied in the identity of whichever patient SimMan™ happens to be enacting in that scenario, are opaque – the mannequin takes on a human-like form, but the students cannot see the whole picture until the educator pulls back the veil (or curtain) and reveals the patient's story in his teaching narrative. It is the entanglement of the performative effects of the educator/mannequin/patient storyteller that allows the assemblage to hang together and makes space for the modes of knowing to emerge. However, the educator does so in such a way that the students must sort through the various hidden parts of the scenario and piece together the missing narrative to demonstrate that they know what comes next in the story.

In this way, the educator-as-Anansi can be seen to be engaging in a practice that enacts a hidden curriculum, where the mobilisation of knowledge takes place within an undercurrent of what might be considered a hybrid form of allegorical folk tales. This assemblage of educator, as oral storyteller, in entangling his practices with those of the shape-shifter mannequin, and in guiding the students through the imaginary folklore of nursing practice, is able to stretch the seemingly rigid boundaries of standard nursing practice by using storytelling, myths and allegory to move swiftly and deftly between these multiple worlds. The educator-as-Anansi is both engaging in the telling of the folk tales of nursing practice, while at the same time relying on the performativity of trickster storytelling to weave an allegorical narrative that is bound up in the practices of the mannequin, the educator's own histories of nursing, and the emerging knowing that flows among and between these assemblages.

The tradition of Anansi stories in the Caribbean arose out of a need to sustain the African knowledge systems that the force of imperialism set out to disassemble – to take a forbidden, hidden ontology, and, through the practice of allegory, to allow this knowledge to become concealed in a second, ulterior meaning. These hidden ontologies, while hidden in Anansi stories, became durable, passed on from generation to generation in oral storytelling. Here the educator enacts a very similar practice. The dominant medical knowledge portrayed in the nursing standards must be respected, but the folk tales derived from the nursing practices in the experience of the educators can

serve as an allegory for what actually happens in practice. So, by enacting the practice of trickster, the educator draws attention to nursing practices by entangling these folk tales within techniques designed to test the students' ability to understand when they are being tricked – by the patient, or by the technology. In the same way that Anansi storytelling tradition sought to resist the dominant curricula of empire by using allegory to conceal and preserve traditional knowledges and pedagogies within trickster storytelling, the educator-as-trickster mobilises these nursing practice knowledges that might otherwise remain hidden. By telling these stories, the educator is at the same time employing the mannequin's practices as a mediator in his teaching practices while overcoming the limitations of SimMan™-becoming-patient – he is engaging in modes of knowing that are allegorical. By using "what is present as a resource to mess about with absence" he "makes manifest what is otherwise invisible" (Law, 2004, p. 90). Moreover, it is the uncanniness of these allegorical enactments of educator/mannequin-becoming-patient that allow the simulation education assemblage to hang together.

Chapter 5

Performativity: Pretending, performance and play

> *In the case of performance art at least, every new version runs the risk of losing the original —or of regaining it.*
>
> (Latour and Lowe, 2010, p. 6)

To tell the story of nursing practice, the nurse educators not only enlist the practices of allegory and folk tales, but also the practices of theatrical performance and play. The similarity of the simulation lab to the theatre might seem obvious on the surface. Let me set the scene:

It is 08:00 and the educator has arrived at the simulation lab to prepare for a day of teaching. The simulated ward is staged to replicate a typical ward in any Scottish hospital. The room is almost square, with a small opaque window in a door situated along the outside wall. At the top end of the room, the wall is equipped with the same façade as a hospital ward – there is a plastic conduit panel that runs nearly the width of the room, housing connections to all of the necessary elements that the nurses might need; multiple electricity sockets, portals for oxygen, air, and suction, and a light source in the form of a large angle-poise lamp. There are numerous cables hanging from the electrical outlets, and various hoses hang from most of the gas ports. Along the bottom of the conduit panel there is an aluminium rail for hanging equipment: air and oxygen masks and bags, suction devices, and plastic beakers to measure fluid. There are empty hooks on which other items might be hung. A hospital bed dominates the room. The bed is situated in the centre of the room, made up with hospital sheets, blankets and pillows. It is not a simulated prop – it is a second-hand hospital bed scavenged by the nurse educators from surplus equipment from a local hospital, still bearing the emblem "X-RAY DO NOT REMOVE". It is connected to the electrical power so that the patient can be elevated or reclined, or the height of the bed can be adjusted, as necessary. It sits on castors that can be locked into place or unlocked to wheel the bed away. It has retractable side guards to stop the patient from falling out of bed. At the

head of the bed is a monitor that can be connected by wires to the patient, with various analytical devices for monitoring heart rate, blood gas saturation levels, and blood pressure. Situated around the bed there is a privacy curtain, a table for the patient's meals, a chair beside the patient's bed, and a bed-side table. In addition, there are trolleys full of the materials that the nurses may need in their caring practices; air hoses, oxygen masks, artificial airways, sphygmomanometers, stethoscopes, blood sugar test kits, and epi-pens. There is a table on which a telephone stands, "the biggest asset we've got in here", according to John (15 September, Session 1), accompanied by various pieces of stationery; pens, pencils, a stapler, and some SBAR forms. A wash-basin with a soap dispenser and paper hand towels is situated near the door, as well as a dispenser of antibacterial gel. There are boxes of sterile disposable gloves of different sizes, and a roll of disposable polythene aprons. There is an emergency trolley housing the defibrillator and all of its cables.

The mannequin lies in the bed under a blue checked blanket. It lies on its back, sheets pulled up to the neck. The mannequin stares blankly at the ceiling, blinking occasionally, mouth agape (Figure 7).

Figure 7: The simulated ward

In the calm before the students arrive, the mannequin's quiet breathing and the soft clicking of the blinking mechanisms can be heard. To the left of the mannequin stands a wheeled trolley. On the trolley is a defibrillator and its numerous cables. Underneath, on a shelf below, there are some papers, some defibrillator pads, a dispensing tray, and a paper kidney-shaped dish. An IV stand, complete with a bag of clear fluid, looms behind. Another trolley occupies the corner opposite. It houses several clear plastic drawers, each full of equipment, but the top surface is clear, apart from two clips for holding documents. Despite these, a clip-board hangs on the side of the trolley. There is a gentle smell of plastic – latex, perhaps. Across the room, next to the bed, is a long counter-top. On its surface several objects are cluttered: anti-bacterial hand gel, batteries, cables, a laptop, documents, pens, paper towels, surface wipes, a sharps container, another clip-board, and a jumble of unidentifiable straps, tubes and cables. The laptop displays the software that is connected wirelessly to the mannequin. A pair of eyes displayed on the middle of the screen blink when the mannequin does. Pink air moves in and out of an animated image of a pair of lungs. The mannequin breathes quietly, and his chest moves up and down rhythmically, mimicking the image of the lungs on the laptop.

This space, with its myriad objects, replicates the material world that is a hospital ward, but also comprises the objects that make up a separate, but connected, material world – a simulation teaching room. Each of the objects act as props in the scenario, and most of them, with the notable exception of the mannequin itself, would be able to traverse the boundaries of the simulated ward and be fully functional in the routine practices of any hospital setting. In a sense, the simulated ward might be seen as the stage, where the set is equipped with all of the necessary props to enlist the audience in observing the performance of the actors: the nursing students who participate in the scenarios. By placing the mannequin and all of the other materials in a certain way, and by turning on all of the equipment and selecting the appropriate software algorithms to run in preparation for the day's scenarios, the educator, in a sense, has dressed the set before the start of the performance; before the arrival of the actors and audience alike.

Along the wall at the foot of the bed are three large windows, housing one-way mirrored glass. On the other side of these windows is the control room (Figure 8), where the educators and the observing students sit during each scenario. About a dozen

chairs are placed against the back wall for the observers to sit on. This space can be compared to the space where the audience might sit in a theatre during a performance, as this room is always darkened during the scenarios so that the students who perform the scenarios cannot see the observers and so that it is easier for the observers to see the performers. In addition, the desks, with all of the equipment needed to run the scenarios (Figure 8), can be likened to the prompt corner in stage management in a theatre; where the stage manager sits at a prompt desk to co-ordinate the performance and control all of the on-stage mechanical operations.

Figure 8: The control room as prompt corner and audience space

Both of the educators acknowledged the theatrical qualities of their simulation teaching practices, but when I asked them how the mannequin contributed to that, they first described SimMan™ as a 'prop' or a 'tool'. However, here George illustrates clearly how the educators enrol the mannequin as much more than merely a prop – how the performativity of the educator/mannequin-becoming-patient enactments allow the mannequin to become so much more:

> The mannequin fits in as just being a prop in this instance, there isn't a huge amount for the mannequin to do, because the patient is lifeless in this instance from the outset, so the mannequin becomes … it's a

> prop all the way through, it's there to let you see their technical skills, he's there, and I will relate to the mannequin to try and make him real to them, that they must still touch and examine, because they always focus in on that, because of the fractured hip, there will have been a wound there, is that the source of the problem? So I want them to physically look, and I've set the scene and I've given them information, so hopefully by this time the mannequin is less a mannequin but a – I was going to say a living/breathing patient, which in this case, he's not – but someone with a life and a back story and that gets a connection there, because they can relate to people who come in with a history of falls through confusion and poor mobility and, and all that kind of thing.
>
> (George, Interview 1)

So, in his performance as educator/mannequin-becoming-patient, by weaving in the "back story" about the imaginary patient, George performs the "living/breathing" patient into being by enacting these stories in his entanglements with this seemingly "lifeless" prop.

Within the simulation scenarios, the educator performs multiple theatrical roles: the role of the director, guiding the action in the scenario, and the role of the sound and light technicians, providing any theatrical effects necessary for the scenario. He performs the role of the patient, enacting the voice of SimMan™-as-patient, and the roles of switchboard operator, radiologist, porter, and lab technician on the telephone. He also plays a cameo role by sometimes entering the scenario as an extra character, such as an ambulance driver, a cardiologist, or a family member. The observing students are the audience – when the scenario is finished, and the other students return to the observation room, they applaud their colleagues' 'performance'. The observation room acts also as the backstage area, where the scenarios are prepared. It often houses costumes, for example, the white coat that the cardiologist will wear, or wigs, spectacles, clipboards, and other materials that might be brought into the scenario to simulate a particular character in the story. The premise of the simulation is that the students must practise as though they were enacting their skills as *realistically* as possible in a ward setting. However, their enactments, and those of the educator, are

imbued with the *practice of pretence* – each of the human actors in this theatrical production must acknowledge and remain acutely aware that they are *pretending*.

This space, while it replicates the ward exactly, is a facsimile. But it is also a simulacrum. It is a false double (as described in Chapter 4). In ANT terms, it might be considered a translation. The replication of the clinical practice space can be described as a distribution of objects-as practice in a comingling of transformations, mediated by the very act of being replicated. As Latour writes, this "'translation' now takes on a somewhat specialized meaning: a relation that does not transport causality but induces two mediators into coexisting" (Latour, 2005, p. 108). This space is mediated by the clinical practice space and the simulated ward, while at the same time it acts as a mediator between practice space and teaching/learning space. It generates associations between these two spaces that can be traced through the enactments of the objects-as-practice that are gathered here to simulate a hospital ward. It is designed to replicate clinical practice, but it also serves as a space in which to tell stories and to pretend. In working as a theatre, simulation education enacts theatrical practices. However, it is precisely because of its characteristic as an uncanny false double of a hospital ward that this space, in attempting to replicate the material world of nursing practice, causes interferences in the educator/mannequin/patient assemblage of the educator's practices.

Bracketing and unbracketing the imaginary

One such interference is the way in which the element of pretend dominates the scenarios while at the same time is deferred from them. Paradoxically, the whole point of simulation is to pretend, but at the same time, it is that pretence that must constantly be deflected so as to sustain the pretence of the life-and-death importance of the skills that the nursing students are pretending to practise. The contradictory character of these enactments present the nurse educators with a challenge: not only must they be attuned to guiding the students through the strangely familiar 'in-here' simulation landscape in a game of pretend, but they must also concentrate on ensuring that these modes of knowing are being enacted in appropriate ways to connect them to nursing practice 'out-there'. The nurse educators demonstrate great agility in making abrupt moves between these two contradicting method assemblages that seem to oscillate constantly.

During the scenarios, the students sometimes become engrossed in the element of play and they take on the role of 'making up' parts of the unfolding narrative. This breaks

one of the central tenets of simulation learning: the instructor is in control of the imaginary narrative that makes up the story; he is the storyteller, and the students must engage their imaginations to take part in the action within the scene that he has set for them, but they must not imagine any new information into being. For example, in one session (George, 6 March, Session 4), five students are involved in treating a patient who is experiencing cardiac arrest. Three of the students are taking turns performing chest compressions, holding the mask against the mannequin's face to maintain the air seal, and squeezing the oxygen through the bag-mask, while another is monitoring and controlling the defibrillator. The fifth is going through a list of possible causes for the cardiac arrest that might be reversible. George continuously asks questions relating to the possible causes of the cardiac arrest, which are referred to as "Hs and Ts" (hypoxia, hyperkalaemia, hypothermia and hypovolaemia; and tension pneumothorax, tamponade, thrombosis, and toxins), as the CPR continues. George asks about the Hs and Ts, and one student suggests "thrombosis":

George: So, thrombosis, what was giving him the pain here?
Chris: A clot.
George: A clot in his … coronary artery … so is that a thrombosis?
Chris: Yeah.
George: Yeah, where else do patients get thrombosis?
Chris: Legs.
George: So, check the legs as well …

The student moves to the bottom of the bed and lifts the blankets up to expose the mannequin's legs. Without touching the mannequin, the student points to its leg:

Chris: That one's red and swollen …
George: No, it's not!
[Laughter]
George: I'm running the scenario, you're not!

(George, 6 March, Session 4)

It is impossible for the mannequin to simulate thrombosis of the leg, so the student has decided to engage in her own scriptwriting practices and to invent this symptom and thus suggest a possible cause of the cardiac arrest. However, this act of pretending has

breached the acceptable boundary of the lecturer's imaginary mannequin/patient story. The educator has already pre-determined what the cause of the cardiac arrest is, and it is an integral element of the assemblage that is permitting the scenario to hang together. It is also crucial that the students manage to correctly surmise the imagined infliction. All of the actors (human and non-human) engaged in this scenario are enacting practices of pretending, imagination, and play, but this student has strayed too far away from George's specificities of the scenario and is in danger of disrupting the practicalities of the modes of knowing here. George attends to this interference in the network by first *bracketing* (Mol, 2002, p. 64) the hidden practicalities of running the scenario by reining in the student's imagining practices and clearly marking the boundaries of this imaginary scene. Equally, however, by *unbracketing* the hidden practicalities of guiding the students through the scenario, the educator can open up possibilities to lead them into the unexpected and useful conduits that are opened up by these imaginary theatrical practices. Mol (2002) describes how the *bracketing* of such practicalities creates incoherence in the assemblage, threatening to erode its stability, but that this incoherence can be overturned by "*unbracketing* those same practicalities again" (2002, p. 64, emphasis in original). George's imagining practices are both bracketed and unbracketed at the same time, which both reins in and unbridles the imaginations of his students. The way in which George responds to the student breaking away from the imaginary boundary reveals the hidden practicalities of nursing practice, but it also serves a second function – to establish the boundaries of the simulated human patient as a mode of knowing, thus allowing the assemblage to hang together. This is an example of how the lecturer must use the imaginary in multiple forms and to oscillate constantly between *realistically* playing and *pretending*. These oscillations add further layers of complexity to the assemblage.

For example, the students must be taught to pretend realistically; to imagine that they are participating in the scenario as though it were located in the absent hospital ward, and that the information that George is providing is plausible. However, at the same time, they must be taught where the boundaries of this imaginary space lie, and how the imaginary game of simulation differs from play. In imaginary play, there is usually no 'teacher', per se; instead, all of those actors involved in play are permitted to use their own imagination to modify and shift the narrative. In simulation education, however, only the educator is permitted to perform the act of modifying the narrative. The

students must learn to restrict the limits of their imagination, placing boundaries on how far it can extend. Consequently, the lecturer must constantly attend to repairing these boundaries as and when they erupt – reining in the imaginations of the students if they run away with the action and disrupt his teaching practices. This is a very delicate balance and the boundaries are easily breached. However, part of the way in which the educator accomplishes this task is by constantly manipulating the story so that it is *distributed* between the multiple material worlds, *moving* the narrative out of the imaginary and situating it within clinical practice on a hospital ward.

Ironically, however, the trickster-mannequin, after operating for several hours, does simulate the symptom of having hot legs. The mannequin's legs house the battery packs that enable the function of wireless operation, and the heat that is generated is substantial enough that the students sometimes ask whether the legs are supposed to be hot (George, 21 March, Session 4). While the legs had not yet overheated on the mannequin in the former example, and as the student had not touched them to feel them to check, and because she was just pretending that they were, these physical manifestations of heat in the mannequin-as-patient's leg, whether real or imagined, added to the uncertainty of simulation learning. Which of the symptoms displayed by the mannequin can be trusted to indicate that they are simulating a human body realistically? When must the educator intervene to bracket and unbracket the practices of the mannequin as it moves between these multiple material worlds?

Oscillations between the pretend and realistic pretence

> Real patients are hard work and real events are stressful, so it's linking backwards and forwards, toggling between simulation and reality all the time, to try to get that focus and try to get that suspension of disbelief.
>
> (George, Interview 1)

These uncertainties about the limits of the imaginary in simulation education are further disrupted by the multiplicity of the material worlds that are enacted in simulation education practice. In George's sessions, he is teaching the students about practising immediate life support skills. During the immediate life support scenarios with both educators, and, indeed, in clinical practice, various algorithms are used as mnemonic devices to remind the students about the skills they must enact and of the correct order

in which they must perform them (for example, the ABCDE algorithm). These must not be confused with digital algorithms – in clinical practice and education, many acronyms are used as a reminder of the steps that must be followed in various problem-solving processes; they are standardised across professions, and multiple international jurisdictions, and are updated regularly, and these are commonly known as algorithms. They are very visible in the simulation lab, pinned to walls and cabinet doors, for easy access and as constant reminders (Figure 9).

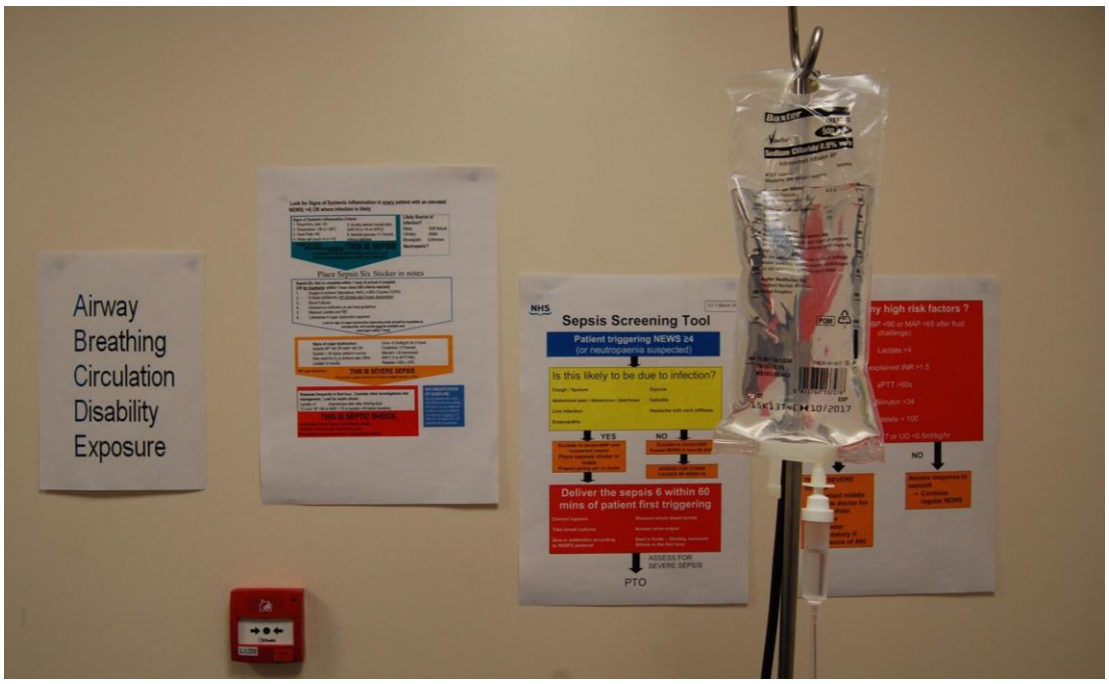

Figure 9: Various mnemonic algorithms visible in the simulation lab

In this scenario, the students must assess the patient's condition by following the ABCDE algorithm. Five students are gathered around the mannequin, and two have been selected to perform in the scenario while the others observe. George provides the background information about the scenario: "This man has been brought in, he's 55 years old, his name is Bob, and he's got central chest pain. Will you have a look at him for me?" (George, 27 March, Session 1). The students are confident – they make good suggestions, they follow the algorithm, and they work well as a team. They quickly tend to the 'airway' and 'breathing' elements of the algorithm, and then move on to 'circulation'.

One student attaches the ECG monitor to the mannequin, and George provides some more information about the patient/mannequin:

George: So, we've put him on an ECG monitor, and we've got a 12-lead ECG organised. He's got high blood pressure – 174 over 96 – anything else we can do at this point?

George/Bob: *"Oh, you'll really need to give me something for this pain, it's really awful."*

Paula: Pain relief.

George: How are you going to do that?

Mary: Morphine IV access.

George: Okay. Well, put – get a cannula, then.

Paula: We haven't done the cannulation course yet!

George: Today you can do anything.

(George, 27 March, Session 1)

Here the students are unsure about the boundaries of their authority in this world. George has explained that they should do everything in the simulation lab that they would do in practice on the ward. However, they are not fully qualified yet. To meet the education standards set by the NMC, they have a list of skills that they must be taught in the classroom setting before being allowed to try them on patients in their practice placements. These skills are listed in their Ongoing Achievement Record (OAR), a thick ring binder that each of the students are given at the start of their studies and which contains documentation of their practice placement and training histories, each of which must be 'signed off' by either their nursing educators or the mentor who supervises their practice placements. Although they are in their third year, these students have several months left in their training programme, and they have yet to be signed off as competent practitioners of the particular skill of cannulation. The students know that before they are allowed to practise cannulation they must have the classroom training and be signed off, and this is one skill that acts as a metaphor for the culmination of their three years of study: once they have been given the authority to cannulate, they will become practising nurses. Perhaps because of the significance of this tenet, the students seem very wary of going ahead and trying to insert the cannula in the mannequin, but George guides them:

> Now, I know you guys don't cannulate – for the purposes of today … you can do all sorts of wonderful things. I know you don't cannulate,

> and you will probably go on to learn that when you qualify, but for the purposes of today you can.
>
> (George, 7 March, Session 1)

Here the boundaries of nursing practice and pretend become evident: in the nursing practice world, they must not pretend to be qualified to cannulate a patient. In the simulation world, however, it is acceptable to pretend that you are qualified to cannulate a patient. This assemblage differs from the boundaries of play observed in George's reining in of the students' imaginations. Instead of teaching them how far their imaginations can go, George gives them permission to imagine that they already possess this skill and cross beyond the bounds that they would in the nursing practice world. Because learning the particular skill of cannulation is not the purpose of today's class, it is acceptable here for them to pretend that they can cannulate. However, this assemblage of simulation learning is also connected to the practices that the students *must not* pretend to practise. Again, this oscillation between *pretending* to practise and practising *realistically* creates a tension: the students are taught that there are certain practices that would be unacceptable to perform as play, yet they must also know how these realistic practices link with the pretend ones. But, in these examples, by unbracketing the practicalities of cannulation, George is allowing the two worlds to hang together.

Learning to pretend realistically

There are numerous instances where *pretending to practise* was permitted, and even encouraged, by both educators. Sometimes these emerged as a result of breakdowns in the equipment, and at other times because the educator would overlook them in prioritising the learning of skills encompassed in that particular syllabus. For example, in the scenario when John-as-cardiologist pretended to be shocked (9 February, Session 1, see Chapter 4), the clamps that connect the AED machine to the mannequin-as-patient kept coming loose while the students were performing chest compressions. As a result, the AED machine was unable to make an accurate assessment. The machine is able to determine that the clamps are not properly connected, and so instructed the students to "Check pads"; which they did. After each two-minute cycle of CPR, the AED machine attempted to assess the mannequin-as-patient again, but each time the clamps became disconnected. John explained to the students observing in the control

room that "there is something wrong with the connectors" on the AED machine, and that he keeps asking the administrators for new ones, but that they have yet to arrive. These relations between the mannequin, the AED machine, the bureaucratic process of procuring new equipment enact an interference in the simulation education assemblage.

In this particular scenario, the students must demonstrate that they can follow the ABCDE algorithm and that they understand and can perform effective immediate life support skills so as to save the life of the mannequin/patient cyborg. However, the prop that is the AED machine is disrupting the movement and distribution of the objects, and thus threatening the stability of the theatrical assemblage. The material world where new equipment is requisitioned, where purchase orders are approved, where budgets are monitored and scrutinised before these new objects can enter the assemblage, is remote from the simulation learning space. It is not physically remote – it resides in the same building. The method assemblages that enact the connections that must be made to bring the new AED clamps into being in the world of the simulated ward might operate in a separate world, but they are still integral to allowing the other to hang together (Law, 2004). The distribution of these effects has been disrupted and thus the object cannot move between worlds. As Law (2004) suggests, and as described in Chapter 4, these method assemblages are then an enactment of "*presence*, *manifest absence*, and *absence as Otherness*" (p. 84).

John must act quickly to re-establish the absent enactments, introducing new practices that will acknowledge this absence and serve to mediate this gap in the assemblage, and thus allow it to hang together. Because John is most concerned with how the students are using the AED machine, the priority of pretending realistically is reversed. Instead of pretending realistically to perform sufficient chest compressions, John asks the students to "just go through the motions" (9 February, Session 2), and explains, through the Smots™ camera speaker, that the AED connections are not working properly. Now the students must pretend realistically to employ the AED machine appropriately, while pretending to perform chest compressions on the mannequin-as-patient. The student places her hands over the patient-as-mannequin's chest and mimes the chest compressions in an exaggerated manner. However, although the students have understood John's instructions and have now started to pretend to perform chest compressions, they are still not practising the appropriate skills to safely operate the

AED machine and John must intervene further by entering the room as John-becoming-cardiologist.

Similarly, George also encourages the students to pretend to perform skills when they are not crucial to allowing the simulation learning assemblage to hang together. While John teaches eight different classes of students over the course of a day, in George's practices, the same four groups of students are taught a series of skills over the course of a day in a rotation with three other educators. This means that the students' progress should accumulate, culminating in the final session where all of the immediate life support skills they have learned that day should be consolidated, and the students should perform them sufficiently well to be qualified to use them in their future practices. Even in these aggregated scenarios, however, a distinction is still made between performing skills in a form of *realistic pretence* and *pretending* to perform others. For example, in the last session of the day, three students are performing CPR on a patient-as-mannequin who is experiencing cardiac arrhythmia. They are organising themselves very well within their team, they make good suggestions and ask good questions, and are quick to respond to George's questions:

> George: So, we've got a tube in and it seems to be working, so what can we do now, a special kind of compressions?
> Paula: Continuous.
> George: Continuous, so when you get to ten you just shout 'breathe' but keep on going. So we've got adrenaline ready … (George, 6 March, Session 4)

After the third shock has been given, one of the students remembers that the adrenaline has to be administered after the next cycle, and she pretends to cannulate the patient by lying the cannula on the mannequin's arm and patting it down.

> George: Okay, you're getting a cannula in. [Sarcastic:] Well done Paula, and it goes in first time, because you're *so* good at that …
> [Laughter]

It is in such moments that the students make distinctly exaggerated 'pretending' motions; they move their hands in such a way that they are signalling clearly that they

are not performing these skills realistically – there is no realistic pretence – they are pretending to perform them. This also happens on occasions when George instructs the students to perform other skills that lie outwith the boundaries of the capabilities of the mannequin, for example, when they are asked to administer morphine intravenously and then flush the medication through the vein with the fluid in the IV bag. These motions are explicitly pretence in that they are a poor facsimile of the skills that are being pretended realistically, but the students adopt certain practices to make doubly sure that the lecturer and the other students can discern that they *are* pretending – that they would not normally be behaving in this way. These acts often include exaggerated movements of the hands, body, and facial expressions in what might resemble a Vaudevillian or pantomime theatrical fashion. The motions are often accompanied by a verbal sound to imitate what these actions might sound like, despite many of them not making any sound whatsoever, in reality. The purpose of these ostentatious actions seems to be for the students to demonstrate to the educator and the others that they know that this part of the scenario *is* pretend. It is a simulation within a simulation. It is at these moments that a different mode of knowing seems to emerge; not that the students have learned to cannulate a vein, but that they can demonstrate that they understand when it is appropriate to pretend in simulation, and when they must practise realistic pretence.

In both of these examples, the students were not new to engaging with the mannequin-as-patient cyborg, as George's scenario was the last of the day, and John's was the last of the semester. As such, the students were more confident in the immediate life support skills that they have been practising. However, they had also become more confident in being learners in simulation learning – they are now demonstrating the skills of good *simulants*; that they are good at engaging with the object-as-practice of the imaginary future nursing practice in the simulated ward. They had also learned how to demonstrate that they can discern when they should pretend to practise, and when they should engage in realistic pretence. Any disturbances of the uncanny had also been dispersed in both groups of students. By this point in their syllabus, not only their skills in CPR have improved, but also their understanding of how to perform well in simulation learning scenarios.

Suspension of disbelief

Another important enactment that emerges in the simulation education assemblage is the practice of 'suspending disbelief'. The term originates in the writings of Samuel Taylor Coleridge, who, in his *Biographica Literaria*, published in 1817, when writing about the literary tradition of lyrical ballads, classified the "poetry of nature" (1817/2014, p. 269) into two sorts:

> In the one, the incidents and agents were to be, in part at least, supernatural; and the excellence aimed at was to consist in the interesting of the affections by the dramatic truth of such emotions, as would naturally accompany such situations, supposing them real. And real in this sense they have been to every human being who, from whatever source of delusion, has at any time believed himself under supernatural agency. For the second class, subjects were to be chosen from ordinary life; the characters and incidents were to be such as will be found in every village and its vicinity, where there is a meditative and feeling mind to seek after them, or to notice them, when they present themselves. (pp. 269–270)

He goes on to explain that, in reading lyrical ballads, when we, as readers, are asked to direct our attention to "the supernatural", we must "transfer from our inward nature a human interest and a semblance of truth sufficient to procure for these shadows of imagination that willing suspension of disbelief for the moment, which constitutes poetic faith" (p. 270). Coleridge's words seem to describe accurately what the nurse educators are asking the students to do. The stories of nursing folklore that the educators introduce to the assemblage are those taken from the ordinary life of nursing practice, but are accompanied by a *dramatic truth* that is enacted by the students having to invest in the "shadows of imagination" that this suspension of disbelief seems to embody. Used ubiquitously in simulation education literature, 'suspension of disbelief' is also a term that both educators refer to in their interviews as a seemingly obvious, taken-for-granted object-as-practice in the distribution and movement of modes of knowing within this particular pedagogy. It is also understood to be an essential element of any storytelling practices; for example, in works of fiction, or in the theatre, in the assumption of verisimilitude, or "the achievement of an illusion of reality in the

audience of a stage play" (Abrams, 1999, p. 320). The theatricality of simulation education, and its aim of achieving an illusion of reality, means that the suspension of disbelief is a method assemblage that pervades the whole world of simulation learning. It is also an object-as-practice in simulation education that is linked very closely to the practices of realistic pretence and pretending, and, as such is implicit in affecting these particular modes of knowing. The assumption is that there is a "necessity for students to willingly suspend disbelief in order to fully engage in learning scenarios based on authentic tasks" (Herrington, Oliver, & Reeves, 2003, p. 59). However, what work does this presupposed entity do in this assemblage, and why is it presumed to be an unquestionably desired achievement in any clinical simulation pedagogies?

The capillary refill measurement provides an example of how certain modes of knowing are mobilised to allow these conflicting and contrasting practices to hang together. In the first scenario of the day, George has asked the students to begin the ABCDE assessment of the mannequin-as-patient, and they have reached the 'C' component of the algorithm. One student suggests that they might check the capillary refill time by pressing on the patient's nail bed. George asks the student to go ahead, and she presses on the mannequin's finger. While she does, George asks her how long she should press for. Again, the students have been instructed, in the preceding lecture, to press for five seconds, and that it should take two seconds for the blood to refill the pressure point. "Five seconds," she responds. After five seconds have passed, the student looks up and tells George, "Yeah, it was fine." George also scolds this student, and reminds her that he is in charge of the scenario: "A wee clue for today – we'll tell you if it's fine or not!" The student diligently repeats the test by pressing on the mannequin's finger again. One of the other students asks, indicating the mannequin, "Are you meant to be able to see it on this?" George shakes his head, "No!" (December, Session 1).

This brief interchange demonstrates that the students have yet to fully understand the capabilities and limitations of the mannequin. Moreover, the students have not yet become attuned to the rules of the simulation, and when it is appropriate for them to suspend their disbelief; that, while the students are expected to play the game by pretending to see the capillary refill occur, only George has the right to manipulate the direction in which the imaginary play is going. Importantly, it is the students who are engaged more closely with the mannequin who seem yet to have grasped the subtleties

of the rules of suspending their disbelief in this particular practice of the mannequin-as-patient. Conversely, most of those who are observing are highly amused by this faux pas and seem to be in on the joke, while the students acting in the scenario are oblivious to the absurdity of the idea that the mannequin can simulate capillary refill. Here, George uses humour to relieve the student from her embarrassment and admonish her gently; "He's good – he's not THAT good!" (5 December, Session 1). In this example, George is asking the students to engage in practices of suspending disbelief and "engaging with the material objects on an 'as if' basis" (Hopwood, 2017, p. 70). However, the enactment of this practice is made up of much more complex relations than simply convincing the students of the 'authenticity' of the scenario. Ahn et al. (2015) suggest that:

> The emotional reactions, like stress and its physical manifestations, emerge from relating to the SimMan3G™ as if it was a real patient whose life is in the emergency team's hands. Going through emotional reactions and learning how to handle these under pressure cannot be learned from books, these have to be experienced. If the students are unable to suspend disbelief the simulation falls apart. The experienced 'authenticity,' including the emotional reactions, involve students' ability to relate to SimMan3G™ as a real medical professional would relate to a real patient. (p. 7)

However, in my observations, it was not the distribution of a constant and sustained suspension of disbelief that held the scenarios together – instead, it was the abilities of the educators to mobilise modes of knowing by quickly flitting *between* the practices that convey the sense of suspension of disbelief and those that disrupt it. The authenticity of the materials in the simulation were not important, nor was the ability of the students to disregard any inauthenticity – it was more about the agility of the educator to move and distribute the modes of knowing in multiple ways. Sometimes, when the practicalities of the simulation are not able to 'hang together' to replicate practice, the pretence of the suspension of disbelief is completely discarded. The educator instead draws attention to the need to acknowledge that there are multiple enactments within this simulation education assemblage, and that some of these objects-as-practice are able to manipulate the scenarios by crafting the relations so that the

absent practices of nursing education, as method assemblage, are able to shift the locus of the learning. The mannequin is implicit in embodying those practices that serve to convey the students into enacting a world where the suspension of disbelief is possible. At the same time, however, this rapid oscillating between enacting *realistic pretending* practices and knowing when *not to pretend,* allows further information about the capabilities and limitations of the mannequin to emerge and be made clear to the students – the rules of the imagination game are being mobilised at the same time as the practice knowledge. This layering of multiple modes of knowing illustrates how the students' understanding is distributed in different places at the same time (Law, 2016) and suggests that "knowing is a matter of *moving*" between "a *multiplication of viewpoints*" (p. 36, emphasis in original) rather than remaining anchored in one.

Chapter 6

Fluid and nomadic practices

> *We have to be able to consider both the formidable inertia of social structures and the incredible fluidity that maintains their existence: the latter is the real milieu that allows the former to circulate.*
>
> (Latour, 2005, p. 245)

The preceding two chapters (Chapters 4 and 5) explored the nurse educators' trickster storytelling and performative practices in their assemblages with the objects-as-practice of simulated human pedagogies. This chapter provides an analysis of how these practices can be considered fluid and nomadic, and how these qualities render them implicit in performing the multiple worlds of nursing practice/education into being.

Mol (2002) argues that objects and the spaces they occupy are enacted in complex relations, and that these enactments allow objects to move between material worlds. It is the multiple enactments of relations that unfold within the different worlds that allow one object to shape-shift – to become something else – so that a single object in one world will be enacted in a different way in a parallel one. I find Braidotti's (1994) conceptualisation of the nomadic very useful for understanding how objects-as-practices are able to flow from one world to another by enacting a radical distribution of interconnectedness:

> Though the image of 'nomadic subjects' is inspired by the experience of people or cultures that are literally nomadic, the nomadism in question here refers to the kind of critical consciousness that resists settling into socially coded modes of thought and behaviour. Not all nomads are world travellers; some of the greatest trips can take place without physically moving from one's habitat. It is the subversion of set conventions that defines the nomadic state, not the literal act of travelling. (p. 5)

These figurative acts of travelling are implicated in SimMan™'s practices – the mannequin's physical form rarely leaves the physical ward space, but the complex relations between the practices of the educators and the materials in that space allows SimMan™-becoming-patient to traverse into a "fictional terrain" (Braidotti, 1994, p. 6) as a nomadic object-as practice. In addition, Braidotti (1994) emphasises how "the potency and relevance of the imagination, of myth-making" (p. 4) offers a "figurative" (p. 1) and "creative sort of becoming; a performative metaphor" (p. 6) to open up unexpected modes of knowing.

Such myth-making practices recall the shape-shifting trickster qualities of the educator/mannequin-becoming-patient enactments, described in Chapter 4, that allowed for this movement between the figurative and the literal realities of nursing education and practice. In simulation education, certain objects-as-practice, or "bundles of actor-networks" (Latour, 2005, p. 218, see Chapter 1) and their enactments move freely within and between these multiple realities. However, as Law (2004) suggests, "dealing with bundles of partially overlapping methods assemblages" (p. 80) and their multiplicity and difference generate disturbances as they are translated within and between realities. In a similar way in which the educator-as-Anansi and SimMan™ are shape-shifters in embodying the practices they enact in the simulated ward, other iterations of SimMan™-becoming-patient can move and be distributed between multiple material worlds, changing their qualities as they traverse fluidly between them.

Sometimes this shifting and translation – and becoming-other – is detrimental to the assemblage. However, these practices can often be beneficial. For example, de Laet and Mol's (2000) observations of the Zimbabwe bush pump illustrate that this particular object is so successful precisely because it is able to change its form – it is a shape-shifter. Because it takes on different forms as it is enacted within different spaces, they describe it as being a *fluid technology*. As such, it is nomadic. Similarly, in the multiple material worlds of nursing education, SimMan™ is an example of a technology that is fluid and nomadic. Each mannequin is manufactured in the same way in the factory in Stavanger in Norway, but once it is installed in the multiple simulation labs across the world, it becomes a different, shape-shifting, heterogeneous product of the different actors and translations in each one – it becomes a *fluid*

technology. In doing so, SimMan™ engages in a process of heterogeneous engineering that generates multiple material worlds of nursing practice and its simulation.

However, it is not only the technology-objects/actants, that are fluid in this assemblage. In nursing education there are myriad objects-as-practice that are also capable of movement between, and are distributed among, these multiple realities/worlds.

The sternum rub and trapezium squeeze

One example of a fluid object-as-practice is the sternum rub, a method used to determine whether an unconscious patient is receptive to pain. Similar to the bush pump, whose enactments are made durable in the network by its shape-shifting practices, the sternum rub emerges as a disruptive actant in the simulation education assemblage. In addition to the ABCDE algorithm, the students must learn the 'AVPU' scale, which signifies: alert, voice, pain, unresponsive. The AVPU scale is an assessment scale, based on a simplified version of the Glasgow Coma Scale, an algorithm used to determine the patient's level of impairment to consciousness, based on various stimuli. The students must demonstrate that they know this algorithm and that they can follow it and correctly assess the patient's level of impairment. In one of George's scenarios, the students must perform an assessment of a patient who is found lying on the floor, unconscious. The students approach the mannequin/patient and begin the assessment, guided by George:

George: Is he alert?
Sally: No.
George: No, is he responding to voice?
Sally: No.
George: Have you shouted at him?
Sally: Can we shake him?
George: You can give him a little shake … and shout at him to open his eyes. [The student does so.] Okay. Is he responding to pain? How do we inflict pain acceptably on people?
Sally: Sternum rub.
George: [Gasps.] Sternum rubs are horrible things and should be banned. I once saw a patient who was bruised from the

top of the sternum to the bottom of the sternum because of vigorous sternal rubbing.

Sally: Supraorbital pressure?

George: That's horrible as well, because you can poke somebody's eyes. The acceptable way to do it is, you know when somebody comes up behind you and pinches your shoulder muscle to get your attention, it's really horrid, it's quite a horrid sensation, it's acceptable because it doesn't mark people, and it also excludes the fact that if you've got a spinal injury, it should be above the level of a survivable spinal injury, okay?

(George, 6 March, Session 1)

Here the student has suggested two outdated modes of assessing alertness, each seemingly more invasive than the last. Each time the practice is suggested, George responds with shock, gasping, or sucking air through his teeth, raising his eyebrows in scepticism. To deflect this practice away from the scenario, George brings in a past experience to demonstrate how it might be inappropriate, telling an anecdote of an incident where he observed a particularly inappropriate use of the sternum rub practice. He uses his own body to enact the violence of this technique, quickly rubbing a fist up and down his own sternum. Afterwards, he demonstrates on one of the other students how the trapezium squeeze might be a more gentle and appropriate technique when considering the wellbeing of the patient.

There is something significant in the way in which George shifts the focus of the embodiment of this practice away from the mannequin/patient and centres it on his own body and those of the students. Ironically, this rapid shift away from the mannequin/patient seems to engender this teaching assemblage with a more 'patient-centred' quality – somehow, by moving away from the mannequin/patient, situated centrally in the space, and enrolling his own body to demonstrate this disruptive practice, a more patient-centred mode of knowing is distributed. This deflection away from the mannequin seems to have a dual role in the educator's practices: distancing the violent and outdated practice from the mannequin reinforces the message that such clinical practices do not belong within the nursing practice world enacted by

SimMan™; and diverting this fluid practice to centre it on the educator intensifies its potential to cause harm to human patients. Drawing attention to this particular practice enacts a new mobilisation of knowledge – highlighting the effects that it might have in the nursing practice world diminishes its effect in the simulation education world, making it less durable and thus no longer fluid and able to circulate there.

I noticed that the sternum rub practice was suggested as a pain response technique by each group of students that I encountered in my observations with George. Each time, the introduction of these practices in the scenario created ripples and disrupted George's teaching practices. Each time, he guided the students instead to the less aggressive practice of the trapezium squeeze. Why did each group of students suggest this technique? Where did they learn it? George did not instruct the students *not* to perform the sternum rub, but at the same time, he mobilised the knowledge that this particular practice is undesirable, unethical, outdated, and conflicts with patient-centred care practices. Curious about this invasive object-as-practice, I used the video footage of the scenario described above to ask George about what he was doing in these encounters with this nomadic practice, asking him specifically to talk about how he was using his own body to teach.

> It's getting them to focus on *me* rather than the mannequin for a moment while we have this aside, if you like, from the main action, to illustrate a key point that they can carry forward into their practice. You know I can still see that guy's chest, dark blue through being vigorously rubbed, and you know, that isn't acceptable, and my tone of voice is different as well, I'm very clear that I think that's not an acceptable technique, and I think there was a bit of a sucking of teeth about eyes [supraorbital pressure], and you know, pressing on the eye socket *is* painful, and in some circles it's still advocated. I'm not a fan of it because what's to stop you poking someone in the eye? So, I've gone through two techniques which they've probably seen, perhaps even have used, which are *less* desirable to what is the gold standard, so we're acknowledging what they've seen and experienced, but we're giving them a better technique as well. So, rather than just go, "No, no," which is *very, very* negative, *obviously,* it acknowledges

> that there's more than one way to crack an egg … there are other techniques, but this is what we *want* you to do.
>
> (George, Interview 1)

Here we can see that, as the sternum rub moves from clinical practice, to practice placement, to nursing education, it might be considered a nomadic practice. It flows easily between realities. However, it is also one that, once manipulated in the disruptive practices of the educator/mannequin – in translation – it is mediated; it loses its durability and is obstructed from moving back into the nursing practice world. In the multiple worlds through which George traverses, the sternum rub still circulates freely in the clinical practice world. The students have learned this technique either by seeing it performed in their practice placements, or they have been taught it by other educators or by practice mentors. This object-as-practice still exerts great influence in allowing the vast assemblage of immediate life support standards to hang together. However, clinical guidance published as long ago as 2006 (Nolan, Soar, & Lockey, 2006) advocated the practice of administering the trapezium squeeze as a pain stimulus rather than the sternum rub or supraorbital pressure in immediate life support procedures. In his desire to instil the "gold standard" of nursing practice in his students and to observe the principles of patient-centred care, George must acknowledge that the sternum rub is still out there, circulating in the parallel realities (Mol, 2002) of clinical practice. At the same time, however, he engages this object-as-practice by making it implicit in his teaching practices to gently deflect it out of the simulated ward world and, hopefully, the students' future nursing practice that they "carry forward" into their future material worlds, too.

> So it's using what I know about some of the other bits, not just teaching from the manual … and that's one of the hazards, that you end up just teaching to the manual, but not acknowledging that – the manual's there as a guideline and sometimes, a bit like going off-piste skiing, you know, you can have a richer experience by going slightly off-piste – but acknowledging when you've got to come back to it, because there are aspects of this which must be done to the letter.
>
> (George, Interview 1)

George demonstrates here that he acknowledges that the sternum rub moves and is distributed between multiple practice worlds. His teaching practices, entangled with the constellation of actants in the simulation education world, allow him to manipulate the sternum rub object-as-practice by deflecting it backwards, into the periphery and away from these enactments, rendering it Other and exiling it from the assemblage, and thus preventing it from moving forward into the students' future practices. At the same time, he is exerting his own influence in these future worlds by conveying the trapezium squeeze forward, acting as emissary, perhaps, in ensuring that these more acceptable practices are carried there by the students to become part of the network of their clinical practice. Thus, by mediating these practices in the simulation lab, some objects-as-practice dissolve and dissipate, while others are made more durable; once enrolled in the simulation education world, their translation allows them to become nomadic and they are allowed to circulate freely.

In the same scenario, one of the observing students introduces a new object-as-practice to the constellation of actants by mentioning that she observed a medic administering a sternum rub as part of the AVPU assessment of an unconscious patient while on placement in the emergency care unit of a busy hospital. She explained how the medic had rubbed so hard that the patient had started to bleed. Here, George again adopts the role of emissary by carrying this student's past experiences forward into the next day's teaching – when a student in the new group suggests the sternum rub as a pain stimulus, instead of relating his own sternum rub story, George uses this student's story instead. This indicates how problematic practices that are distributed fluidly between practice placement worlds and the simulation lab are intercepted and deflected by the educator's interference with them, first drawing attention to them, then pushing them to the periphery, and blocking them from being taken forward into the students' future nursing practices. It also indicates how the storytelling practices are nomadic; all notion of a centre is dissolved (Braidotti, 1994) as they move fluidly between the educator's practice experience world and the simulation education world, and, once there, they are further transformed and continue to circulate and enact new realities. It is the assemblage of these folk tales of nursing practice, when combined with the educator's storytelling practices, however, that enact the mobilisation of the understanding that this rogue practice is inappropriate, rendering it impotent and reducing its influence in the network. Paradoxically, it is the end of its ability to mobilise further within the network

that allows these movements of the sternum rub object-as-practice between material worlds to enact a particular mode of knowing; it only embodies a powerful mobilisation of nursing practice knowledge after it has stopped migrating between the reality of clinical practice and arrives in the simulation lab to be extinguished by the practices of the nurse educator.

Each nursing school in Scotland has a certain amount of flexibility in determining and describing their prescribed curricula, but the contents must conform rigidly to the *Standards for Pre-registration Nursing Education* of the NMC (2018b), which are intricately bound up in their professional standards as a whole (NMC, 2018c). As such, nursing schools must constantly update the content of their individual curricula, and each new version that emerges is subject to the scrutiny of examination by a panel of Council representatives who engage in a process of 're-validation' of each new incarnation of the curriculum every five years. To satisfy the professional standards examiners, each nursing school must be seen to be incorporating the latest research evidence within the curriculum content, as well as within their teaching methods. This confluence in the assemblage is one in which all of the activities and materials enacted in the multiple material worlds of nursing practice and research, clinical and medical practice and research, and their practicalities, come together. However, precisely because of the multiplicity of the practicalities of these different processes, the individual objects-as-practice that should be conveyed fluidly between the boundaries of these worlds can often be disruptive shape-shifters. Because they are enacted as different practices across different material worlds, they often take a different form in each, and thereby interfere with the mobilisation of the distribution of modes of knowledge between worlds.

Deviations, unlearning and relearning

With the arrival of the sternum rub, George was attempting to deflect this object-as-practice in favour of newer, more patient-centred ones. In other instances, however, the educator often lets the students make errors or deviations from standard practice, and refrains from correcting them, as long as they are focusing on the learning objectives of this particular scenario. For example, on the sixth day of my observations with George, the group of students introduced a new practice that I had not yet seen in any of the earlier sessions. It was the first scenario of the day and the students were being asked to

demonstrate the correct insertion of the artificial airway (a tube inserted through either the nose or the mouth to support the breathing). George demonstrates the various types of airways, either nasopharyngeal (via the nose) or oropharyngeal (via the mouth), and the importance of fitting them correctly so that any oxygen administered during CPR will not leak out the side of the airway. This is accomplished on some of the artificial airways by inflating a latex ring that acts as a seal around the opening to the laryngopharynx, or by using an airway made of pliable gel (an i-gel airway) that is supplied already inflated. After the airway has been secured, it can be used as a portal for connecting the airway to sources of air or oxygen, surrounded by a mask that covers the face and nose. The students must correctly position the mask on the mannequin's face, and they must hold it, and the airway, securely while CPR is administered so that none of the oxygen leaks out of the sides of the mask. In this particular session, after inserting the artificial airway in the mannequin's mouth, the students tie a length of white satin ribbon around the artificial airway and secure it to the mannequin's head by tying it behind the ears. The introduction of this new practice puzzles me, and, as each student takes a turn inserting the airway, each one ties it off in a different way, with varying levels of success. In subsequent sessions, I watched the practice of tying off the mask closely. The students sometimes seek George's approval after making an attempt to tie off the mask, either by asking him, or other students, how they have done. Some tie the ribbon very confidently, while others only make a half-hearted attempt and the ribbon is left loose and seemingly redundant.

At the end of the day, I asked George why he had not demonstrated this in any of his classes so far, and asked him where the students might have learned this skill. He explained that the students would have been taught this previously in their clinical skills syllabus, but that he did not want them to concentrate too much on that particular skill – he did not want to draw attention to it because it was not the point of the lesson. He said that, while it was important to secure the mask in an emergency situation, so that the artificial airway does not project too far into the laryngopharynx, he was more interested in today's sessions in making sure that the students had good CPR skills and that they were correctly following the ABCDE and other algorithms (George, Observation notes, 7 March).

Conversely, some older skills, those learned in the educators' own clinical experience, are prioritised over new ones that the students have been taught in practice, but, in these instances, the educator often enrols the authority of his own nursing education to strengthen them and make them more durable in this simulation education world. Both George and John often refer to their own teaching practices as being "the way I was taught" (George, 15 March, Session 2) to tell their own anecdotes about the folklore of past nursing practices. Surrounding this object-in-practice is the continued implied notion that the learning is not "consolidated" in simulation learning: "it is not the period of studying when they learn, but that they 'really' start to learn after they qualify and realise, 'You're the nurse'" (George, Observation notes, 7 March). However, while this belief is indirectly implied by nurse educators, such statements do not reflect the practices of the educator while he is teaching. Throughout each scenario, George continually relates his teaching to his own experience in practice, while at the same time acknowledging that the students will have learned certain skills already, and that these skills might differ from those they are learning in this space, today, and that they might shift as they move from one clinical setting to another. He combines these statements with continual reminders about how the scenarios themselves will differ from nursing practice – reassuring the students that they should not expect the simulation scenarios to unfold as they would in their future nursing practice worlds.

In this excerpt, George has been directing the students through the ABCDE assessment, but the students jump quickly from 'airway' to 'circulation', missing out 'breathing':

Mary:	So, his airway's fine.
George:	So, his airway's okay. So, we can park it to one side for a wee while?
Paula:	Mm hmm.
George	But, if anything changes, we can come back to it. Okay. What's next?
Beth:	Take blood pressure, do pulse …
George:	So, that would be C, wouldn't it?
Beth:	Gosh, yeah.
Paula:	Breathing?

George: You're quite right. When there's more than one of you there, you would probably – somebody would be doing blood pressures, while somebody else was doing something else. And that's the way that we work. But for the purposes of today, we'll break it down into its parts so that we can remember what we're doing when it happens for real.

(George, 5 December, Session 1)

George recognises the student's knowledge of what might happen in clinical practice, and, instead of admonishing her, acknowledges that this is what might happen in clinical practice "for real". These connections between this simulation learning space and practice are tentative, but it seems to be important that they are acknowledged. The notion that simulation represents a space in which practices are slightly skewed and altered in order to promote learning is very important here. The simulated space, at the same time, creates both the sense of uncertainty about what has already been learned in practice in the past, and presents a distorted reflection of the ways in which the skills they are learning will be practised in the future. Yet George insists that this breaking down of the skills into step-by-step components is imperative:

> For the purposes of this we're going to break it down into its components, and that's important for them now, because … getting the sequence set in their minds so that it becomes second nature is really, really important, and at times vital information will be lost because someone's jumped ahead …
>
> (George, Interview 1)

So, it is not that the practices they have learned are not correct, but it is important that, as qualified nurses, they are able to perform them in the correct sequence "without thinking" (George, 22 March, Session 3). In this sense, many of the skills they may have observed or been taught in practice, such as jumping from the A to the C component of the algorithm, must be un-learned and then re-learned in the correct sequence, so that they become second nature, or so that they can be forgotten, in a way, when they reach their future nursing practice. Thinking about these practice skills as objects-as-practice allowed me to become attuned to their importance in the simulation

learning assemblage, making these things "visible, audible, tangible, and knowable" (Mol, 2002, p. 33, see Chapters 2 and 3). In addition, I became attuned to the "*distribution* and *movement*" (Law, 2016, p. 36, emphasis in original) and to the fluidity of both the practices that the students are learning, and the practices of the nurse educators, as these assemble as a set of material relations (Law, 2004) to make manifest the multiple realities of nursing practice.

The bloods card

In observing the practices of both nursing educators, I noticed incidents where both George and John ask the students to 'bring back' artefacts (knowledges) from their practice placements so that they can be (re)enacted by being incorporated into the scenarios and hence their teaching practices. For example, in one session (John, 9 February, Session 7), two students have been asked to assess a patient who has been admitted to the ward with chest pains. Here it is important to remind the reader that some of the nurse educators' practices may seem to be shocking and the way in which they sometimes engage with the students may be controversial. However, again, in this example, this is the last ever simulation scenario that this group of students will experience before they qualify as practice nurses – the students are familiar with the simulation space, with the simulated human patient, with the format of the scenarios, and with the educator's practices. Although John's engagement at the end of the scenario may seem surprising, again, it is important to note how this somehow facetious and ad-libbed performance is foremost enrolled as a mediating practice to reinforce the consequences of failing to maintain the necessary pretence in demonstrating how to safely care for patients who are at risk of dying.

The scenario progresses until the patient's condition suddenly deteriorates so that he goes into cardiac arrest. After the mannequin/patient cyborg has stopped breathing and loses consciousness, it takes quite a long time for the students to respond and organise themselves. They forget to first call for additional help. They are delayed by starting CPR without having an additional nurse to attach the AED machine to the mannequin/patient. This leads to further delays, and what would normally be a very straightforward scenario takes much longer than usual. Eventually they manage to call for help, another two students are dispatched to assist, they continue CPR and defibrillation, and they manage to revive the patient. As soon as the

John/mannequin/patient begins to cough, one of the students speaks to him while two of the others begin to tidy away the materials that they have used in the scenario. They remove the oxygen bag-mask and replace it on the nozzle. They remove all of the ECG and saturation leads from the mannequin, roll them up, and hang them tidily on their respective monitors. Although the scenario seems to be coming to a close, the students should not have taken away the oxygen supply or the monitoring equipment so soon after a life-threatening episode. "What are they doing?" John cries, raising his hands over his head, emphasising their error to the observing students, who immediately recognise what the others have done, exclaiming, "They've killed him!" John re-sets the mannequin's software controls so that the mannequin/patient has again gone into cardiac arrest and is no longer breathing. Having removed the materials that would be enrolled in communicating this shift in the patient's condition, the students do not notice that it is deteriorating. John stands up and rummages in a tray sitting on the control room desk, asking the observing students, "Can you check in that pocket, there? See if there is a measuring tape?" The observing students seem puzzled, and one hands him the tape. "I'll show them," John says, and rushes into the simulated ward. The students are surprised to see him, and seem unsure whether this is still part of the scenario. John approaches the mannequin/patient and stretches the measuring tape over the mannequin/patient from toe-to-head. "What is he doing?" one of the students ask another; "I'm from the Co-op," John replies, "I'm just measuring for the coffin."

The students all laugh, and they all move back into the control room for the de-brief session. John is rewarded for his performance – the students waiting in the control room applaud and cheer, and John settles them and begins the de-brief. He asks, "What happens next? So, you've managed to save him, but what happens next? Where should the patient go?" Here, John is testing their knowledge of the standard practices that normally occur in the clinical settings for the particular NHS trust associated with this nursing school and in which the students are placed for their practical experience. After a cardiac arrest and resuscitation, a strict procedure must be followed, which includes the taking of blood samples from the patient to assess their likelihood of having a recurrent arrest. While John is listing the various types of blood tests that must be ordered, one of the students interjects – she rummages in her bag and brings out a small, pocket-sized purple card, and hands it to John. She explains that she was given the 'bloods card' at her last placement in the A&E unit and that it lists all of the blood tests

that they must request after a patient has experienced a heart attack or cardiac arrest. John asks for a copy of the card so that he can make duplicate copies to keep in the simulation lab. He reprimands the students, complaining that they "don't bring knowledge back to him" (John, Observation notes, 9 February).

The object of John's request is to keep the educators up to date with what is happening in the parallel world of nursing practices in the healthcare settings that the nurse educators might not be familiar with. The educators are still qualified to practise nursing, and indeed, they still do, but their teaching duties can sometimes interfere with their modes of knowing, excluding them from learning about any subtle shifts in the various practice landscapes in which the students travel. By asking the students to convey these objects between these heterogeneous method assemblages, or multiple worlds, the role of emissary now belongs to the enactments of the students. In an uncanny doubling of the teaching practices of the educator, the students now adopt the role of the "*distribution* and *movement*" (Law, 2016, p. 36, emphasis in original) of knowledge-objects between the enactments of the nursing practice world and those of the simulation education world. While the educator can convey these knowledge-objects from his multiple worlds (his past/current nursing practice experience, the past/current practice placement experiences, and the imagined future nursing experiences) through his teaching practices from and between one group of students to the next, he may sometimes be excluded from participating in the same parallel realities that the students encounter in their practice placements. The bloods card that the student carried into the simulation education world from the practice world is an object-as-practice that has a literal and practical function in its enactments in the practice world of the A&E. As it moves between the two worlds, it shifts and takes on a new, and perhaps higher, significance – it becomes something else. As such, it enacts its own allegory. It is the continued *distribution* and *movement* of these knowledge-objects between these multiple worlds of method assemblages that allows understanding to be located in different places at the same time, but to take on different forms of enactment, and thus to be "multiple, allegorical and mediated" (Law, 2016, p. 36).

Breakdowns and disruptions

Another example of how the nurse educator's practices are mediated in this way occurs whenever there is a breakdown in the mannequin's mechanical functions. For example,

several times during my observations, with both George and John, the mannequin stopped working properly. Sometimes students accidentally cause the equipment to malfunction or turn off by knocking out power cables or disconnecting the clips that connect the defibrillator to the terminals on the mannequin's chest. On one occasion, the students thought that they had caused the mannequin/patient to die (21 March, Session 3), illustrating an example of a disruption that mediates their learning enactments. When these disruptions occur, they illustrate how the technology is implicit in shaping the educators' teaching practices as well as in steering the mobilisation and distribution of learning.

For example, early in my observations with George, the mannequin developed a leak in the tubing that connects the air compressor to the mannequin's lungs. The lungs comprise two rubber sacs that cause a plastic flap to rise when they are filled with air, and then to fall when the air is expelled through the mannequin's mouth. When there is an air leak in the system, the software on the laptop that controls the mannequin displays a warning message (see Figure 10).

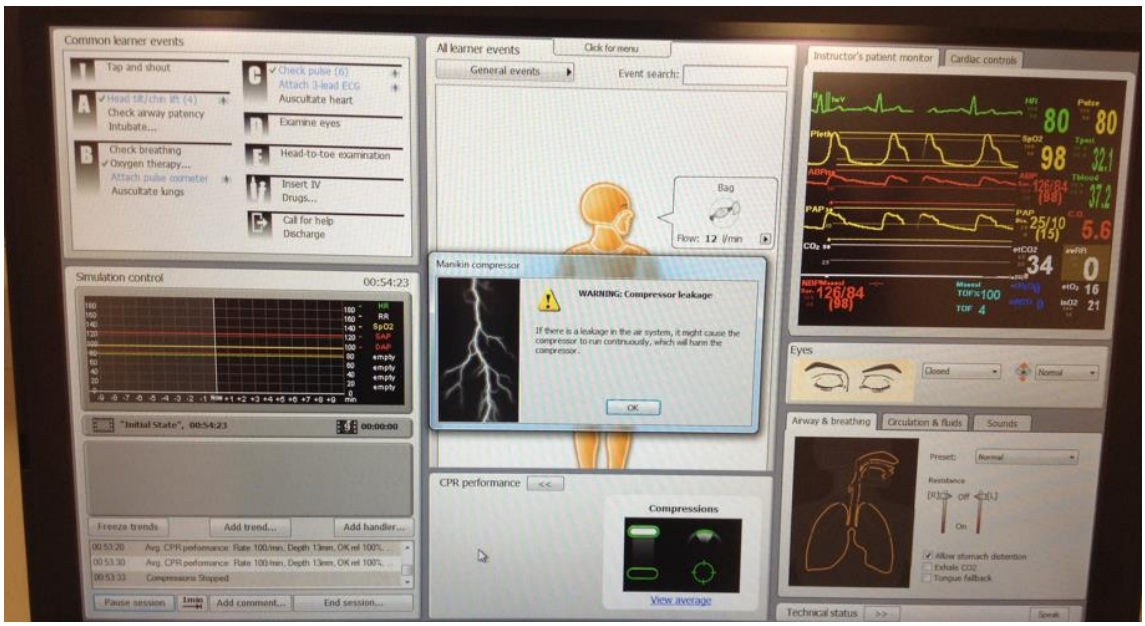

Figure 10: The compressor leak warning message

In this scenario, it is not the warning message in the mannequin's operating system software that alerts George to the fault – instead, it is the students. During one of the first sessions of the day, the students must demonstrate that they have learned to assess the patient's condition correctly by performing a series of physical observations: using the ABCDE algorithm, they speak to the patient/mannequin to verify that he is alert and

responsive, then they assess the quality of their breathing by checking their respiratory rate. At the same time, they examine how the patient/mannequin is breathing by placing their hands on either side of the ribcage. As the student observes the breathing movements of the patient/mannequin, she notices that the chest is not rising normally. Looking at the mannequin's chest, she reaches forward and places her hands above the mannequin/patient's chest:

> Beth: Looks like it's just this side that's going up and down. [Indicates on the mannequin. George comes closer to have a look.] Like, I mean, compared to this. [She gestures by touching the mannequin's chest.]
>
> George: Does it look a bit unilateral, does it? [George checks the laptop and sees the warning message.]
>
> Beth: Yep.
>
> George: That's probably just the mannequin.
>
> (George, 5 December, Session 1)

Here, George acknowledges that the student has noticed how a unilateral movement of the chest might indicate a serious underlying issue with the patient's breathing – something the students have been learning about in their lecture earlier that day and in the preparatory readings they have been doing for the simulations. However, this disruption in the mannequin's enactments force George to suspend the pretence of the fidelity of the scenario by also drawing attention to the limitations of the mannequin.

This is a good example of how the educators enlist a composite of multiple – and often diverging – practices to address the challenges and tensions they encounter in enrolling simulated human pedagogies in their teaching practices. It also illustrates how these modes of knowing are nomadic: the knowledge that the student brings to the scenario of the danger of a unilateral chest movement is distributed in her enactments in the simulated ward, but a breakdown in the enactment of the mannequin's practices mediates this mode of knowing. Because the mannequin's breakdown is invisible to the student, the enactment of the unilateral chest movement enacts a "*multiplication of viewpoints*" (Law, 2016, p. 36, emphasis in original); that of the student, the mannequin/patient, and the educator, who must work quickly to diffuse the disruption of the compressor breakdown. This reveals how "*what is known is almost less*

important than the processes of knowing itself" (Law, 2016, p. 39, emphasis in original), and that it is instead the movement and distribution of that knowing by the enactments of the educator/mannequin assemblage that stabilises the student's mode of knowing.

Empathy for eidolons

The uncanny figure of SimMan™-becoming-patient can be considered an eidolon – in its original sense: an idealised person or thing; but at the same time, a ghostly spectre, a phantom (OED, 2019). Empathy, however, is also an eidolon that haunts the simulation education pedagogies – an idealised practice, it is both present and absent, and at the same time, familiar and unfamiliar. In my observations and in the interviews with both participants, empathy was a recurring spectre. It appeared and disappeared in the landscape of the materials, but when I asked about it specifically, it transformed and became something else – compassion, mostly, for the patient. But here, significantly, George talks about empathy as being both highlighted and hidden at the same time.

> This is a chance to simulate something that they may well get involved in in the future … the compassion and empathy – I want to tap into what they've already got, and compassion and empathy are … it's not something you can teach, you can promote it, but it's not like formally learnt, however, we need to think about it because it's been highlighted as being missing or 'hidden' – in the way that we are working in a much more pressured way.
>
> (George, Interview 1)

As such, empathy, as an object-as-practice in the nursing education assemblage, is uncanny. It is extremely important, yet elusive and unteachable, and, as George suggests, can often be overlooked in practice. It is at first prioritised and appears to be central, and is then pushed away to the periphery, hidden in a fog of mythical repute. It is always present, but at the same time absent.

While the object-as-practice of empathy was elusive in the interviews, in my observations it was ubiquitous. In George's practices, when the scenario is designed to confront the students with the death of a patient, the emotional modes of knowing that circulated were very moving and the ways in which each new group of students

encountered these difficult situations with empathy and compassion was very emotive. Although John cautioned his students not to use words such as 'empathy and compassion' because "they mean different things to different people" (John, 15 September, Session 3), he often told anecdotes as examples of the mobilisation of empathy in his teaching practices. For example, in several de-briefing sessions, he told many stories of the mobilisation of empathy, even one exemplified by a student who had originally refused to engage with the uncanniness of the mannequin. At the end of the semester, despite participating in the scenarios, the student still maintained that she 'hated' the simulation learning experience because of the mannequin. John, however, found the video footage of the final session and played it back to show her that she had, in fact, engaged very well with the mannequin, even demonstrating that she was practising an emotional mode of knowing:

> And this student who hated it, and we had to show her at Week 5 that she was stroking his hand because his wife had died, and this was a student who didn't want to go anywhere near the 'plastic dummy', and she was stroking his hand to try and empathise – that was empathy coming out – just natural. You can't teach that.
>
> (John, 15 September, Session 3)

This example demonstrates how powerful the educator/mannequin assemblages are in mobilising the emotional knowledge of nursing practice. I also observed this emotional mode of knowing emerge several times during George's sessions, where students had become so moved when they realised that the mannequin-becoming-patient had died that they started to cry.

Dignity for dolls

In my observations with both participants, another object-as-practice emerged – and one linked closely with empathy – the practice of enacting dignity. In one of the introductory sessions, when the students are being introduced to the simulation lab, John is describing the technological and physiological limitations of the mannequin, but at the same time reveals a very significant observation about the performance of enacting dignity in the simulated human teaching and learning assemblage:

> The other thing that's never happened in fourteen years – he sometimes vomits. Okay, now, what we do is we get a wee bowl and we put cold vegetable soup in it … and we made the sound effects – I'm very good at making the sound effects – but nobody has ever given him a mouthwash. Now, in the ward, he'd have a mouthwash, or you'd give him his toothpaste to clean his mouth out – nobody has ever given SimMan™ a mouthwash.
>
> (John, 15 September, Session 3)

In contrast to the mobilisation of the enactment of empathy for the patient/mannequin, here John reveals how another desirable moral attribute of practising person-centred nursing care remains hidden. This reveals a tension between the strong effect of the practices of the educator/mannequin assemblage to mobilise knowledge, and the strong effect that the mediation of the uncanny practices of SimMan™ has in the simulated ward space. Sometimes the fluid and nomadic practices of the educator/mannequin emerge as powerful modes of knowing, but sometimes they conceal them.

Conversely, these enactments of empathy and dignity are sometimes brought clearly into focus. For example, after the scenario described above, when the mannequin's breathing malfunctions, George and another of the educators tend to the task of investigating the mannequin's air compressor leak while the students are on their lunch break. Leaving the software running so that the mannequin's breathing function is active, they remove the latex sheet that forms the mannequin's chest and torso to reveal the mechanisms that gather to enact the simulation of a human patient's biophysical processes (Figure 11).

Figure 11: Opening the black box of the mannequin's breathing mechanism

With its internal mechanisms visible, it became clear how the mannequin was enacted as an object-as-practice in that observing it in this way was akin to opening up a black box for me. However, this opening up of the black box of the mannequin's practices also revealed to me the hidden practicalities (Mol, 2002) of how the educators, in this hybrid assemblage of nursing, teaching, and cyborg enactments, are themselves implicit in allowing the simulation of the human body to hang together. In Figure 11 above, both educators are enacting practices that are enrolled in promoting the ideology of person-centred care. Despite it being even more evident that the mannequin is *not* a human patient in the act of opening up the abdomen and chest, the educator has still preserved the dignity of the simulated human patient by covering the mannequin's genitalia with the sheet. In addition, the second educator has placed her hand on the mannequin's forearm in a reassuring gesture that very probably would also be embodied in her everyday, taken-for-granted enactments of compassion and dignity in her encounters with human patients in a clinical ward setting.

Moreover, not only were the educators enacting the practices of compassionate care in preserving the mannequin's dignity, they were also replicating the same practices that they were teaching that day. In Figure 12 below, notice how the educators are employing the same skills that they use in immediate life support to assess the condition of the mannequin, determine the cause of its deterioration, and apply an appropriate intervention to 'treat' the mannequin's 'symptoms'.

Figure 12: Multiple enactments of dignity and nursing practice

Once the latex cover has been removed and the mannequin's abdomen is open, the nurse educator pictured here tilts her head to one side so that she can see the mannequin's chest rising and falling while at the same time listens and feels for air moving. Here the educator enacts an exact replica of the skills that the students must enact when assessing the patient's physical condition in the 'B' component of the ABCDE algorithm – to check the patient/mannequin's breathing by looking down the chest while listening for sounds of breathing. In this way, the leak was discovered, the hole repaired, and the mannequin re-assembled, ready for the next scenario. This

example illustrates how the educators' practices, in their assemblages with the mannequin, are often an uncanny double of their nursing practice and teaching enactments.

Although it was fascinating, to me, to see how the mannequin's components were assembled to produce the biophysical replications, it was the educators' enactments of these new (non-clinical) practices that proved most significant, and were most useful in illustrating how their practices depended on those of the mannequin, and also, how the mannequin's practices were implicit in making their nursing practices durable. The way in which the nurse educators addressed the challenges that emerged within this breakdown revealed how these realities are multiple: how this "plethora of techniques" (Mol, 2002, p. 75) enacted a multiplication of reality. It did so by drawing attention to the coming together – the *suture* – of multiple objects-as-practice of nursing practice (as described in Chapter 3) that I had observed them teaching about in the scenarios to enact a powerful mode of knowing in the simulated clinical practice space.

In crafting a hybrid set of practices to overcome this disturbance in their teaching, these nurse educators are enacting multiple objects-as-practice that are similar in form, but that converge to produce a set of relations that resonate and amplify (Law, 2004) the patterns of nursing practice within their simulation teaching assemblage. In addition to attuning to the sociomaterial practices that embody the person-centred principles of promoting dignity and empathy, these examples of breakdowns and disruptions in the simulation learning assemblage also reveal how the *manyfoldedness* (Mol, 2002, p. 84) of these objects-as-practices allow the method assemblage to hang together. This method assemblage provides an example of what Law (2004) describes as a creative "hinterland of realities" (p. 143). He writes how the method assemblage:

> re-crafts realities and creates new versions of the world. It makes new signals and new resonances, new manifestations and new concealments, and it does so continuously. Enactments and the realities that they produce do not automatically stay in place. Instead they are made, and remade. (Law, 2004, p. 143)

Thus, these enactments are multiple – these ways of knowing are fluid – they move and are distributed and overlap in a multiplication of realities, allowing the nurse educators'

practices "*to be both outside and to be inside at the same time*" (Law, 2016, p. 36) to become powerful modes of knowing. Moreover, the manyfoldedness of the nurse educators' practices as they engage in these simulation teaching enactments and "gathering of things" (Law, 2004, p. 143) are implicit in producing multiple realities.

But the technological is still inextricably connected with the biological in nursing education, and enacts a practice of promoting and maintaining the safety of the human patient, both in their care, and in the education of those doing the caring.

> At the end of the day, it's people we're dealing with. The technical knowledge part is to make sure that you're doing the safe things with an organism, if you like. If you want to be really precise about it, well, we should be.
>
> (George, Interview 2)

It is this assemblage, then, between the human nursing practices and the technological materials that they engage with (and that engage with them), that brings together a composite of parallel worlds to preserve the patient's dignity and enact care with compassion and empathy.

The method assemblages of simulation education

> *Even once reality has fully set in, the question of its unity is still pending.*
>
> (Latour, 2005, p. 118)

The examples of the fluid and nomadic practices of the nurse educators presented in these three chapters (Chapters 4 to 6), as expert storytellers, performers, and emissaries, illustrate how they must be *double agents*, in both senses of the word. They must be able to move between multiple worlds, adapting and mediating multiple practices within the simulacrum of nursing education (see Chapters 4 and 5). While teaching the students to be efficient and effective practising nurses, they must also teach them to be efficient and effective students of simulation – effective enactors of simulating nursing practice – or *simulants* (see Chapter 5). Sometimes, when the practicalities of the simulation are not able to 'hang together' to replicate nursing practice, the pretence of the suspension of disbelief is discarded (see Chapter 5), or *bracketed* (Mol, 2002). The

nurse educators' bracketing and unbracketing practices in the simulation education assemblage (see Chapter 5) allow for the absurdity of the pretence to be abandoned – the uncanny activities of simulating practice knowledge are no longer hidden, but are instead acknowledged as enactments of nursing practice in their own right. The educators may be expert shape-shifting tricksters in the world of simulation education (see Chapter 4), but they are also expert teachers in deftly navigating the simulations, imaginary and technical, so that they can mobilise knowledge across, between, and beyond these multiple material worlds of practice.

Chapter 7

A posthuman dialogue with the human actants

> *We live in a time in which we are being told that the main things of value are the things of science and the things of technology. Our lives are being compressed into this technological reality. But it is worth remembering the many-sidedness of being human. Great evil befalls us when we restrict ourselves to just one side of our being.*
>
> From *The Mystery Feast*, by Ben Okri, 2015

At the outset of this thesis, I framed the research in terms of a set of questions. While these questions were useful in allowing me to become attuned to the *negotiations*, *enactments*, *embodiments*, and *tensions* of the teaching practices in enrolling simulated human patients in nursing education, they were neither explored in the order that they were first presented in Chapter 1, nor did their associated findings emerge in that order. Instead, the insights that were gained were effects of the research assemblage: rather than following a pre-determined set of actions in a linear way, the mobilisation of these insights were embedded in my research practices and the relations between the human and non-human actants in complex, multi-faceted, and unpredictable ways.

In deciding how to present this chapter, I was inspired most by St Pierre (2018), whose conceptualisation of post-qualitative research challenges traditional humanist qualitative methodology that "provides a handy pre-existing research process to follow" (p. 603). She suggests that these prescribed, taken-for-granted, formalised and methods-driven methodologies fail because they discard "what seems too strange to count as science" (p. 607). Given the importance of the strangely familiar in my explorations of the simulation education practices, in reporting the findings of this thesis, I felt that my chosen methodology warranted a diversion from a more 'traditional' presentation. Moreover, and similar to St Pierre (2018), I felt that my enactment of "writing and thinking and the laying out of the field of the text, moving" (p. 606) produced the greatest provocations for presenting the risky, creative, surprising, and remarkable

practices of the simulation education assemblages that I had observed. As such, this chapter deviates from the more conventional form of the discussion chapter in that I aim to tell the stories of the nurse educators by presenting the chapter in the form of a dialogue with them.

In keeping with a critical research approach, I was also influenced by Gadamer's (1975/2004) conceptualisation of research inquiry, as proposed by Hammersley (2005); that "inquiry is above all a dialogue with others" (p. 147) – that this dialogue should not be governed by a rigid pre-determined method, that it is "more like a journey where we are recurrently faced with choices about which direction to explore, when to tarry, and when to move on" (Hammersley, 2005, p. 147). Gadamer (1975/2004) suggests that such dialogue should work to overcome the "false prejudices" or "the prejudice against prejudice itself" (Gadamer, 1975/2004, p. 273). Hammersley (2005) notes how Gadamer (1975/2004) advocates engaging in dialogue can act to "discover what can be learned from that engagement" (p. 148). In presenting this chapter in the form of a dialogue, I was thus able to disrupt any potential prejudices that might arise out of the taken-for-granted form in which a doctoral thesis should take. I also feel that, by subverting the more 'traditional' way of presenting, I am acknowledging the importance of the storytelling practices of the participants: rather than adhering to a prescribed, linear structure in addressing the research questions, by telling the stories of the nurse educators in the form of a narrative dialogue, I am drawing attention to the complexity, fluidity, movement, and distribution of the practices of the nurse educators.

After completing my analysis of the materials that I had gathered during the observations of the simulation teaching and the interviews with the educators, I prepared a summary of the insights that I had gained and presented these to them as part of a further interview. As described in Chapter 3, I visited each of the participants in person and structured the encounters in the same way in which we had engaged in the elicitation interviews; we sat with a laptop and I presented the findings, using video clips from the digital glasses to draw attention to specific enactments that related directly to these insights. While Chapters 4 to 6 present the posthuman accounts of these enactments, in this chapter, I shall instead explore and reflect upon these insights by weaving my later conversations with the nurse educators into the dialogue to illustrate how the enactments of the objects-as-practices emerged as powerful modes of

knowing in their teaching practices. By bringing in the nurse educators' responses to these insights, in this chapter I am participating in a dialogue with those who might best aid me in telling the stories of simulation pedagogies in nursing education.

Responding to the research questions

This chapter attends to the insights that were gained in the praxiography and in being guided by the ANT sensibilities of allegory, translation, and multiple worlds. As is evident in the preceding chapters (Chapters 4 to 6), the nurse educator/mannequin actants negotiate the simulated clinical practice space (research question 1) by enacting multiple worlds of *performativity*. The analysis also revealed that the teaching practices being enacted in this space (research question 2) encompass *shape-shifting trickster storytelling*, *performativity*, and *fluid and nomadic* practices. Moreover, the analysis revealed that these teaching practices are embodied (research question 3) in these performative practices and in the posthuman hybrid assemblage of educator/simulated human. In addition, it revealed that the performativity of simulation education is also double: while being sensitive to the *performative effects* of modes of knowing that are enacted within this assemblage, it is evident that the assemblage is also enacted as a *performance*. The analysis also revealed that the uncanny doubles that permeate the simulated clinical practice space, and the binary dualisms that haunt nursing practice, often present challenges and tensions (research question 4), and that it is the distribution and movement of these objects-as-practice that work to overcome the disruptions generated by these conflicting forces.

In tending to the research questions throughout the analysis, and in presenting this discussion, I found Law and Ruppert's (2016) collection of writings on *modes of knowing* helpful, as they align closely with the way in which my analysis had progressed. The book seemed to arrive at the most opportune time in my doctoral project – consolidating the sensitivity that I had been developing about ANT and sociomateriality in the early stages of the research, and then going further to provide me with an even deeper understanding of the insights that were beginning to emerge in the analysis. The papers in Law and Ruppert's (2016) collection look to the baroque as a different way of knowing the world, but they bring together many of the sensibilities that I had already drawn on in my enactments of the research project thus far. For example, in simulation in nursing education: knowledge is mobilised in practices that

are embodied in *emotional modes of knowing* (p. 28); that it works as *theatre* (p. 29); that it *elides the division between inside and outside* (p. 33) in an enactment of *folding* (p. 34); and that knowing is a matter of *distribution and movement* (p. 36). Each of these sensibilities arrive out of and are entangled with the ANT sensibilities of allegory, translation, and multiple worlds that I found to be most helpful in engaging in the activities I had undertaken during the praxiography I performed and in the analysis of the materials that it produced. Just as these baroque sensibilities deepen the authors' knowing practices in "social science and its Others" in Law and Ruppert's (2016, p. 19) collection, they also served to mobilise a deeper mode of knowing for me as I grappled to understand the implications of my ANT-inspired analysis of the nurse educators' teaching practices in cultivating the insights that responded to my research questions. I shall now tend to these modes of knowing in turn – discussing the practices of trickster storytelling; theatricality and performance; and nomadic distribution and movement in relation to these insights.

Storytelling and technology: The educator/SimMan™ as Anansi

The participants in both nursing schools enrolled the practices of storytelling in navigating the simulated human pedagogies. However, they did so by establishing and maintaining strong connections with the practices enacted by the non-human materials that were also implicit in the mobilisation of knowledge in this assemblage. Their storytelling practices were not simply a re-telling of their memories of their own nursing practice experiences – these enactments were intertwined with the practices of multiple non-human actants to bring about the modes of knowing necessary for nursing practice. The human and non-human actants assemble together to distribute the folk tales (as described in Chapter 4) of nursing practice, working through a process of mediation to radically transform the stories into coherent knowledge (Law, 2016) that allows the teaching and learning practices to hang together. The mannequin, for example, is continuously implicit in the (re)enactment of the folk tales of nursing practice. In composing the modes of knowing that emerge in simulation education, the educator-becoming-patient/SimMan™ hybrid (re)enacts the storytelling practices that allow the multiple realities of nursing practice to hang together (Mol, 2002). In addition, the storytelling practices contributed to the enactment of the multiple realities of nursing practice by acknowledging otherness to reveal silent and hidden gaps in the mobilisation of learning.

The folk tales of nursing practice

In each of the chapters describing the analysis (Chapters 4, 5, and 6), the folk tales of nursing practice featured prominently as being implicit within the powerful enactments of storytelling modes of knowing. The ontological significance of any type of folklore is often othered in scientific discourse, and 'folk knowledge' is mostly presented in opposition to 'pure' scientific knowledge. Indeed, it is often used as a derogatory term in relation to medical education practices (Bleakley et al., 2011), and often implies practices that are based in archaic, untrustworthy, old-fashioned, and taken-for-granted assumptions. In the nursing literature, there is acknowledgement that 'nursing folklore' is a prominent feature of the professional learning of nurses and it is often recognised as a powerful source of knowledge in nursing practice (Berragan, 1998). At the same time, however, this mode of knowing is also seen as being positioned in direct conflict with the reductionist "traditional scientific approaches with their emphasis on fact" (Berragan, 1998, p. 213) that mirror the priorities of medical knowledge and "mainstream science" (Morse, 2004, p. 299) on which nursing practice must be modelled. Moreover, the emphasis placed on 'evidence-based practice' in nursing education and nursing research mostly prioritises the privileging of 'hard' research over any other, and the unquestioned acceptance (and since, adaptation) of the ubiquitous 'pyramid of evidence' model (Haynes, 2001, 2006) has acted as a strong force in polarizing the methodologies applied in nursing practice and education research.

Rolfe and Watson (2008) have long debated the authority of evidence-based-practice in the commentary pages of nursing research journals, culminating in a published debate about this "self-styled new paradigm" (p. 486). In one publication, both authors' views are presented, with Rolfe (Rolfe & Watson, 2008) describing the naissance of evidence-based practice as an expert opinion piece in a paper written by the Evidence-Based Medicine Working Group in 1989. He describes that those who conceptualised and named this 'new paradigm' included a caveat that its proposed effectiveness "should be provisional" (p. 486), at least until it had been tested to gather evidence of its own effectiveness. This irony is not lost on Rolfe, who suggests that because the premise of "Evidence-Based Practice" was conceived "in the full knowledge that it is based on belief rather than scientific proof" (p. 486), this assumption is "doubly ironic":

> in so far as a form of practice which places so much emphasis on the findings from research has itself no research evidence to support its effectiveness. Or, put another way, an approach which vociferously rejected the 'old paradigm' of practice based on the authority of key influential figures in the medical profession continues, after 15 years, to sustain itself on the authority of key influential figures in the academy. Hence, the irony: an approach which claims to challenge uncritical, unquestioning and unevaluated practice is itself (in my opinion) uncritical, unquestioning (at least of itself) and unevaluated. (Rolfe, in Rolfe & Watson, 2008, p. 487)

Watson's riposte, published in the same piece, agrees that the evidence is lacking, however, he shifts the argument back to the differences between nurses and their "medical counterparts", and continues to dismiss "intuition, reflection and authority" of nursing practice by asking: "If nursing is all about the untestable in pursuit of the invisible then why bother with it?" (Watson, in Rolfe & Watson, 2008, p. 488). The Rolfe and Watson (2008) debate illustrates how quickly such concepts, or 'paradigms', as evidence-based practice can become enrolled in the network and are quickly translated into pervasive and durable objects-as practice, often without much critical engagement, even after this is advised. Again, however, there is an element of betrayal; the original 'good intentions' proposed by the experts belonging to the Evidence-Based Medicine Working Group have, through a process of mediation, been distributed and enrolled widely across and between the healthcare disciplines, changing their shape as they traverse and relate to other objects-as-practice in the network and, arguably, becoming something else completely. As such, it has become a paradoxical replication of the original. It has become the stuff of myth.

Many such polarised debates arise out of the assumption that qualitative accounts (presumably, those that can be defined as mere intuition, stories and folklore) that attempt to dismiss the significant contribution of systematic, quantitative, evidence-based research simply amount to what Watson (2002) suggests is simply "faking an argument" to create "the illusion of scholarship" (p. 273). Considering this tendency to dismiss nursing folklore as a powerful mode of knowing, it is strange, then, that the practice of storytelling in simulation nursing education, and in nurses' professional

learning, is indeed a very prominent one, as is evident in the practices of the nurse educators in my research.

The progression of nursing as a profession has always encountered comparisons between how medical knowledge and nursing knowledge are mobilised (Berragan, 1998). Nursing practice was traditionally conceptualised as a "vocational discipline" (Dowie & Phillips, 2011, p. 35), encompassing a skillset of principles and traditions that were "passed on through the apprenticeship form of education" (Berragan, 1998, p. 213). As nursing practice and education progressed through the 20th century, it began to adopt "the four key characteristics of a profession" (Thomas & Richardson, 2016, p. 1072): a defined body of specialised knowledge; membership of a group of individuals who have a monopoly on their particular field of work; autonomy in the definition, development, and organisation of that work; and an ethical code of practice to regulate inter-professional relations and prevent the exploitation of clients (Thomas & Richardson, 2016). In shaping this new idea of their profession, nurses sought guidance from their closest colleagues; those in the medical profession. In doing so, the traditional enactments of caring for other human beings in nursing was often pushed to the periphery, and the folklore of nursing practice became marginalised, as it had been in the medical profession:

> As an ancient profession, much of nursing remains cloaked in ritual and tradition. Too many nurses continue to base their practice on 'folklore' and 'subjective myths', rather than questioning, reasoning or research. Folklore-based nursing is practice based on adherence to ritual and tradition, rather than research and theory. (Jacobson, 2000, p. 61)

This rejection of the 'traditional' modes of knowing of nursing practice, and this prioritising of the more rigid modes of knowing encompassed in rationalist medical discourse, served to distance nurse educators from being permitted to engage in enacting their 'rituals' of storytelling practices in mobilising nursing knowledge. However, as Latour (1990) suggests, maintaining a distinction between "prescientific and scientific cultures, minds, methods or societies" with "self-righteous certainty" (p. 2) only serves to generate unnatural boundaries that are enforced by artificial and asymmetrical bias. It is only by replacing this divide, he writes, that we can escape the

"simplistic relativist position" and deflate these "grandiose schemes and conceptual dichotomies" (p. 3). The nurse educators who participated in my research project place great value on the nursing practice folk tales that circulate between the boundaries of pre-registration nursing education and nursing practice, each making clear links between the importance of (re)enacting stories that are drawn from "real" (John) practice experiences:

> So, we try to make it as realistic as possible, and because we've got the clinical experience, I suppose we know what goes on in the wards.
>
> (John, Interview 2)

By embracing the folk tales of nursing practice and enrolling them into their practices, the nurse educators challenge the binary dualisms that are generated by separating out the conceptual dichotomies of nursing tradition and scientific research. The relations that link the educator's experiences of clinical practice to the hybrid enactments of educator-becoming-SimMan™/patient is an example of the *multiplicity* that Mol (2002) describes as the "manyfoldedness of objects" (p. 84). This is exemplified in Chapter 6 when the educators' own nursing practices are enrolled to address the interference of the air compressor leak in the mannequin's breathing mechanism.

The past experiences of the nurse educators occur in single instances, remote from the simulated ward by distances in time and space. However, in their (re)enactments in the simulated ward, these experiences become multiple. These single instances of nursing practice stories are mediated by the performativity of the sociomaterial relations that they encounter in simulation education. If we follow the folk tales to unravel the enactment of nursing practice, they begin to vary from one simulation encounter to another. While each iteration of the re-telling of the nursing practice folk tale might at first appear to be identical, these folk-tale-objects are capable of "shifting the locally enacted identity" (Mol, 2002, p. 143) of the patient who occupies the protagonist role in the story. This was evident in the way in which certain stories, introduced by students, were picked up and mediated by the nurse educators to form new stories that were often a composite (Mol, 2016) of multiple stories (for example, the student's sternum rub story described in Chapter 6). These folktale practices are nomadic, but they also became established as actants that moved between student groups, becoming more and more durable. It is the *interference* of the enactments of the other entities within the

simulated ward that thus allows the story to shift and take on a shape specific to that particular learning encounter: the mannequin, the educator, the students, even the simulated ward space, all influence each folk-tale-object in its endless multiple iterations.

The educator/SimMan™ cyborg as trickster

In telling the folktales of nursing practice, the educator-mannequin-cyborg enacts multiple shape-shifting trickster practices. Both nurse educators enrolled trickster practices, oscillating deftly between characters in the scenario and enacted multiple performances in their assemblage as educator/SimMan™-becoming-patient. John's agility in enacting the voices of the patient, the hospital receptionist, the cardiologist, and the undertaker embodies the shape-shifting trickster's ability to spin persuasive stories to reveal hidden knowledge that become memorable and powerful modes of knowing. But each of these characters are enacted in mediation with other actants in the assemblage, both human and non-human. Braidotti (2006) relates Haraway's (1991) shape-shifting trickster trope to the becoming-animal figuration of the feminist cyborg as a mode of resistance to de-centre the culturally hegemonic positions occupied by such grand narratives as psychoanalysis. This posthuman reference to the trickster is useful in thinking about how SimMan™-becoming-patient might also challenge the prioritising of the social over the material in the literature, particularly as so little research considers the challenges that nurse educators face in their enactments of simulated human patient pedagogies. In the same way that a "sense of kinship and connection" (Braidotti, 2006, p. 202) might be made between Haraway (2018) and her transgenic OncoMouse™ (the first ever patented animal, an organism created solely for the commercial cancer biomedical treatment research market), the enactments of SimMan™-becoming-patient provide a strong connection between the patient/protagonist in the nursing practice folk tales. This link between the trickster trope and the hybrid cyborg are particularly appropriate to SimMan™. In many of the traditional First Nations stories of Turtle Island (North American) folklore, the shape-shifting coyote trickster always becomes embroiled in situations where he is trying to outsmart someone for his own gain, but he always ends up dying because of his foolishness. Each time he is killed, he is revived, usually with the help of other trickster animals jumping over his body numerous times (Hyde, 1998).

Traditionally, those who told the stories were seen to be shapeshifters themselves of sorts, but, while humans can share the same qualities as shape-shifter tricksters, they can never be true shape shifters because tricksters are immortal (Hyde, 1998). In this way, we might think of the educator-becoming-patient as the shape-shifting trickster storyteller, but it is the stories about the immortal shape-shifting trickster, Sim-Man-becoming-patient, that he is telling. The nurse educator, in enacting these storytelling practices, is similar to the other, mortal, trickster who jumps over the SimMan™-becoming-patient body to revive him. In each new telling of the nursing folktale he is able to revive the trickster coyote, to reanimate the Sim-Man-patient cyborg to bring the stories to life again. In the same way, the educators, in their storytelling practices, reanimate Sim-Man-becoming-patient to perpetually mobilise the folklore of nursing practices with each new simulation scenario.

However, there are other actants that are implicit in these practices, and which also enact trickster-like practices. For example, when John attempts to make the scenario more realistic by using the mannequin's ear-speakers to voice the patient, SimMan™-becoming-Malcolm, the speakers disrupt the scenario by causing audio feedback (as described in Chapters 4 and 6). To avoid this interference, John elects to enrol the Smots™ cameras to deflect this particular breakdown. In doing so, the voice of educator-becoming-Malcolm emanates from outside the mannequin's body. Here, the educator must first explain to the students that this strange, out-of-body voice does, in fact, belong to the patient. In addition, he allows the students to become sensible to this otherness by acting as *mediator* (Law, 2016) to "*deploy* actors *as* networks of mediations" (p. 136, emphasis in original) to fill in for the absent patient voice by performing it (as described in Chapter 2). Similarly, when the mannequin's air compressor system breaks down, the mannequin becomes a different sort of trickster, fooling the students into thinking the breakdown is part of a test of their clinical skills and knowledge. In these trickster practices, the students are tricked by this *interference* (Mol, 2002, as described in Chapter 2) into thinking that the mannequin-becoming-patient is experiencing breathing difficulties. Rather than this interference having the effect of mobilising knowledge about nursing practice, it disrupts the educator/SimMan™ cyborg storytelling practices, threatening to erode the durability of the knowing relations that are allowing the assemblage to hang together.

To reverse this effect, George must then engage the students in a further trickster practice; asking them to pretend that the mannequin's chest is rising and falling normally. His storytelling practices here allow him to deflect the effects of the trickster mannequin's breakdown to focus on mobilising the knowledge with which the mannequin is interfering. While engaging in the practices of storytelling, both George and John also enact the practice of performativity in a sort of ventriloquist act: by adapting their voices, they indicate clearly to the students which actor they are performing in the theatricality of the scenario. This is an example of situations where the practices of storytelling and theatricality overlap. It is also an exemplar of how nursing education must continually resist the binary dualisms that circulate in nursing practice by enacting a composite of creative folklore and evidence-based practices to enact the multiple realities of nursing education/practice into being.

Storytelling and the science of nursing practice and education

Law (2016) writes about how "the baroque has often been the object of a bad press" (p. 40). The same might be said about 'the folktales of nursing practice' if Jacobson (2000) and Watson (Rolfe & Watson, 2008) are to be believed. However, there is a great deal of evidence in the nursing literature that supports the usefulness of storytelling in nursing practice and education. In many of these examples, storytelling is positioned in opposition to the advancement of adopting new technologies in nursing practice. As long ago as 1995, Bowles (1995) advocated for a turn away from a nursing context "increasingly dominated by technology" and the "rhetoric-laden notion of 'reflexive practice"' (p. 104) and back towards storytelling as a professional learning tool. Bowles (1995) argues that rejecting storytelling creates an environment that "alienates nurses from each other, and from their patients, leaving them emotionally impoverished and distanced from the basic humanity of their craft" (p. 365), and suggests that storytelling facilitates a deeper understanding of the human element of their practices. He suggests that storytelling is a powerful tool, as "tales memorably told will leave indelible impressions, students will remember the ideas as they remember the stories and the people in them" (Bowles, 1995, p. 368, citing Attig, 1992). This same effectiveness of telling memorable stories was emphasised by both George and John in their discussions about their teaching practices and was described as a powerful mode of knowing:

> I meet staff nurses now that were here five, ten years ago, and they still – they don't remember the lecture theatres, but they remember SimMan™.
>
> (John, Interview 2)

> That's where the point of learning is … in the debrief: "We'll never forget that."
>
> (George, Interview 2)

Others have advocated storytelling practices in mobilising knowledge about the patient experience (Charon, 2006; Foyle, 2009; Schwartz & Abbott, 2007), describing how digital storytelling can help nursing students prepare for the "shock of reality" in moving into clinical practice after they qualify (Stacey & Hardy, 2011, p. 159), and how storytelling can promote the development of empathy (Foyle, 2009; Hardy, 2007). In medical education, the "seductive lure" (Watson, 2011, p. 397) of 'narrative medicine' has been introduced to enrol storytelling to improve practice (Charon, 2006; Ironside, 2015; Robertson & Clegg, 2017), another professional development tool from the field of medicine that has been mobilised and translated for nursing practice (Fitzpatrick, 2017; Wang & Geale, 2015). Sochacki's (2010) doctoral thesis explored how nurse educators can use "true stories to add authenticity to a learning objective" (p. ii) by employing storytelling pedagogies in provoking students' capability for empathy and compassion, a skillset that she describes as being "difficult to accomplish with other traditional teaching methods" (p. 110). Another doctoral thesis explored how nurse educators used storytelling as a "metaphorical construct of shape-shifting as an active process in teaching for social change" (McEldowney, 2002, p. ii). In her thesis, McEldowney (2002) adopted a storytelling approach to her research to reveal how the nurse educators used shape-shifter stories to allow them to be "authentic and … true to one's beliefs and values about social change" (p. 182). Hunter (2008) describes how the storytelling of nursing students can be used to integrate "the art and science of nursing" (p. 1) to teach them to learn to be caring nurses. Each of these examples illustrate the same tensions and challenges faced by the participants in this thesis as they negotiate worlds dominated by the authority of science while at the same time navigating through them with creative and artistic pedagogies.

Abrandt Dahlgren, Dahlgren, and Dahlberg (2012), in their discussion about the use of scenarios about the practice-based, everyday events that healthcare professionals might encounter as they go about their professional practice, describe how these 'stories' of caring for human patients can be used as a tool to resist the dominant discourse of the "voice of medicine" (p. 188):

> If the intention is to really give primacy to practice, scenarios need to be viewed as a 'growing web' of understanding, in which there is no predetermined right or wrong answer and which can change depending on what questions are asked and actions taken, just as in health-care practice itself. (p. 188)

Rather than rely on a pre-determined set of potential actions that must be addressed systematically by following a rigid script, they advocate for embodying the unexpected complexity of healthcare practice in conceptualising the scenarios. This caveat is also acknowledged by the participants in my research, obvious in the way in which they insist that it is imperative that they must often wander "off-piste" (George, Interview 1), and that they rely on "no script", because "life in the hospital is not scripted" (John, Interview 2).

Fitzpatrick (2018) argues that professional learning mobilised by 'narrative nursing' is nothing new; it has borrowed from 'narrative medicine' in its name only, and, as a nursing education pedagogy, storytelling has always helped to educate nurses about "the complexity of the human experience of health and illness" (p. 60). However, at first, the participants in my research, particularly John, seemed to liken "storytelling" as being akin to telling lies:

> I've never seen it as storytelling, because they're all real patients. I suppose it's storytelling to the nurses [students], but it's not made up.
>
> (John, Interview 2)

This example suggests that John, while he draws very heavily on the performativity of storytelling, is adamant that these stories of nursing practice are not fictitious – "they're based on real patients" (Interview 2).

This tension between being a good storyteller and being a good clinician is evident in the ways in which both educators defended their adherence to wanting to "produce nurses with good clinical skills" (George, Interview 2) while at the same time insisting that the "real learning" would only take place after they had qualified and were working in a "real" clinical setting (John, Interview 2). They appeared to want to be seen to be telling 'true' stories about nursing practice to mobilise the knowledge that was rooted in the actual experiences of nursing.

Despite both educators not wishing to be seen to be replicating unreliable fictitious 'tale-telling', they both acknowledged the value of creativity in their craft:

> Most teaching is storytelling. Simple as. I mean, how did education start? It was sitting around a fire, telling stories. And you know, if all else fails, telling a story to illustrate a point is often more effective than going into some elaborate theory. You can then see the learning start to come – that's why we do that! So, then the theory comes smacking back up towards it again, and we can reduce that theory/practice gap, hopefully, which is still painfully wide.
>
> (George, Interview 2)

Here, George confirms that his teaching practices are embodied within traditional storytelling practices. However, he also makes a clear link between storytelling and the supposed purpose of simulation education – to narrow the theory/practice gap, as outlined in Chapter 1.

Despite being resistant to his practices being described as storytelling, John also makes a direct distinction between the modes of knowing enacted in telling anecdotes in classroom settings performed by educators with "real clinical experience" and those who just "present the facts" of nursing practice:

> I suppose we tell stories in class, because if you just presented the information, that would be the equivalent of putting ten PowerPoint slides up with bullet points. So, I suppose we are storytelling, because when we do a forty-minute lecture, I tend to wander off on all sorts of

> things, and eventually I come back to where I am, but it's all relevant to the thing I'm teaching about.
>
> (John, Interview 2)

In his second interview, John supports the insights gained in Chapter 6 – that the nomadic qualities of these storytelling practices distribute the modes of knowing fluidly, contributing further to the erosion of the boundaries between nursing practice learning and nursing theory learning.

In exploring the practices of nurse educators, I enrolled the storytelling sensitivity of allegory. In telling the stories of their practices, I also employed the technique of gathering anecdotes (Adams & Thompson, 2016). Herein lies another tension: in the academy, an account that is 'anecdotal' is considered to be unreliable or of little value, arising out of its definition as a story that is "not necessarily true or reliable, because [it is] based on personal accounts rather than facts or research" (OED, 2019). Etymologically, the word 'anecdote' originates from the Greek, ἀνέκδοτα; "things unpublished" (OED, 2019), suggesting, perhaps, that anecdotal research might somehow be 'unpublishable'. However, the word can also signify "secret, private, or hitherto unpublished narratives or details of history" (OED, 2019). This alternative significance might suggest instead that the sensibility of gathering the stories of nursing education allowed these hitherto unnoticed stories of the nurse educators' practices to be uncovered; the fact that they were previously ignored does not detract from their importance.

Theatricality and performance: The educator and the double of teaching in simulation

> "An actor is what is *made to* act by many others." (Latour, 2005, p. 46)

Law (2016) describes how the baroque works as *theatre*. As an example, he describes how the Cornaro Chapel, which houses Bernini's *Ecstasy of Santa Teresa d'Ávila* (c. 1650), has been assembled to resemble a stage in a theatre – its "effects, its dialogues, its scenery, and the multiplication of its artifices are *theatrical*" (p. 29, emphasis in original). Further, Law (2016) describes how the theatricality of baroque artworks also enrol the technique of *boundlessness* by illustrating how the baroque "deliberately sought to destabilise the distinction between audience and actor" (p. 31). The

simulation lab in John's teaching and learning space continuously breaks down the boundaries by permitting the individual facets of the theatre to be mobilised and distributed: sometimes the observation room is the audience space, sometimes it is the stage. Sometimes the actors (here, distinct from *actants*, but nevertheless enacting practices) move off-stage to the audience space, and sometimes the director moves to take centre stage. For George, the boundaries of the spectacle are completely invisible – actors, director, audience, stage, props; each of the effects occupy the same space at the same time.

This sense of boundlessness is also apparent in the central positioning of the mannequin in the simulation scenarios. SimMan™-becoming-patient always takes centre stage. Just as the statue of Santa Teresa is central to the stage set by the theatricality of the chapel, the mannequin's form draws the gaze of the audience towards it. Yet, the mannequin is often completely ignored or rendered invisible as the action ebbs and flows and overflows unpredictably around him. Sometimes the audience joins the mannequin and the cast on-stage. Sometimes the cast move backstage with the audience, leaving the mannequin and its quiet practices alone in the theatre space, just as Santa Teresa is after the tourists, pilgrims, and worshippers have left. Here the mannequin is situated in an uncanny boundless position of being both "part of the spectacle, too close to detach [him]self, and is being included in the exchange of gazes the spectacle affords" (Law, 2016, p. 32). John also notices this uncanny boundlessness of the mannequin when we discussed how SimMan™ embodies patient-centred care: "It's almost like he's there and he's not there at the same time" (George, Interview 2). Here the educators enrol the practices of theatricality to negotiate the contradictions, tensions, and challenges that emerge in the simulated clinical practice space to effect modes of knowing despite these interferences.

Also encompassed in the theatricality is the element of drag. This performativity emerges in the nurse educator's enrolment of the gendered voice when having to voice a patient who is cast as a woman: "I'm not very good at doing women. I sound like Mrs Doubtfire" (John, 15 September, Session 1) (ironically, in the film, *Mrs Doubtfire* (Williams & Williams, 1993) is portrayed as someone who is very good at "doing women"). The mannequin-as-patient is also enrolled in drag performances. The manufacturer supplies the mannequin in an almost androgynous form, but one that is

decidedly more akin to a masculine body. However, the mannequin can be assigned any gender by the appending of appropriate genitalia and by installing various modular body parts; breasts, for example, to represent a woman. Additionally, the educators each kept a supply of numerous costume props –wigs, glasses, hats, scarves, bras, and other articles of clothing that were used to allow the mannequin to take on a role of any gender. While these props were often used to assign the mannequin-becoming-patient a familiar identity, they were sometimes used to mobilise dramatic effects, for example, for comedy, or to shock. These diverse theatrical practices also work allegorically – these props, enactments of drag, ventriloquism, and pantomime, are not just about telling theatrical stories, but they also tell about something else: "something that may be hard to tell directly" (Law & Mol, 2002, p. 15). As such, the baroque technique of theatricality works to mediate the complexity of nursing practice and to allow its modes of knowing to be made manifest in the simulation education space. As I suggest in Chapter 2, Law and Mol (2002), describe how this performativity is implicit in allowing these multiple versions of nursing practice to be enacted in the simulated ward space:

> Performativity, then, is another crucial complexity-relevant trope. The argument is that knowing, the words of knowing, and texts do not describe a pre-existing world. They are rather part of a practice of handling, intervening in, the world and thereby of enacting one of its versions – up to bringing it into being. (p. 19)

These theatrical practices, then, also serve to perform *other* additional realities into being. The uncanny space of simulation in nursing education becomes a reality where knowledge is mobilised by the distribution of nursing practice through multiple spaces that are then transformed, through mediation by the objects-as-practice, by being sensitive to the otherness – or the lack of otherness – to strange, new realities. In this way, the theatricality of these simulation education assemblages are enacting what Law (2016) describes as a form of "the baroque knowing" (p. 39): that, through these movements of *mediation*, the human actants acknowledge that "understanding is about being seized and transported somewhere else that we cannot really know" (p. 39). Somewhere strange, yet familiar. Therefore, the actants, while embodying theatrical practices in the simulation teaching and learning space, also enact practices that enrol the uncanny to bring the multiple realities of nursing education/practice into being.

Rescuing the students from the uncanny valley of the dolls

Royle (2003) describes how the uncanny "involves feelings of uncertainty, in particular regarding the reality of who one is and what is being experienced" (p. 1). The uncanny is a "crisis of the proper: it entails a critical disturbance of what is proper" (p. 1). These feelings of uncertainty and disturbance are common when most nursing students encounter the mannequin for the first time; particularly as they are unsure about who they are *allowed* to be and how this encounter should be experienced. This is apparent when the students hesitate when the educators ask them to perform tasks that they are, technically, not yet qualified to do (see Chapter 5). The nurse educators enrol multiple objects-as-practice to mediate and deflect these emotional responses, but they do so in such a way that these forays into the uncanny valley (Mori, 1970/2012) also become powerful modes of knowing.

For example, when George first introduces the students to the mannequin, he oscillates rapidly between making satirical comments about the uncanny "lump of plastic" (Chapter 4) and drawing attention to how a real patient *should* look. When a student suggests they should check the patient's colour to assess circulation, George first draws attention to the limitations of the physical abilities of the mannequin: "His colour? What about it? He's not very good at changing colour, I'm afraid, he's just – kind of beige" (George, 5 December, Session 1). Immediately, he then shifts the focus back on the imaginary, describing how a patient *should* appear in this situation, and thereby inviting the student to suspend their disbelief to imagine the physical characteristics that SimMan™ is not able to simulate; "Okay, he does look a bit grey, and when you touch his skin, he's a bit clammy" (George, 5 December, Session 1).

In shifting this focus back and forth between the very literal limitations of the simulation and the imaginary conditions of the patient's skin in "real" practice, George reinforces the acceptability of unruly practices in this particularly uncanny space. In addition, however, the humour evoked in the satirical remarks is also enrolled in a valuable mode of knowing. As Watson (2011) suggests, satire works as "a mode of challenging accepted notions by making them seem ridiculous" (p. 405, citing Bronowski & Mazlish (1933/1960). By ridiculing SimMan™'s shortcomings in terms of being able to simulate the colour-changing abilities of human flesh, George enrols satire to challenge the notion of uncanniness embodied in the mannequin-becoming-

patient. However, as he does so, he oscillates between highlighting the mannequin's physiological limits and emphasising what a human patient's skin should be doing in the practice of undulating between realities to mobilise learning. Ferri (2007) suggests that this "theatric reverie" of the suspension of disbelief, which "consists in a rapid alteration (as if it were a kind of vibration) between belief and unbelief" (p. 9, citing Schneider, 1996), has a powerful and multiple effect in a theatrical assemblage:

> Dramatic art has, therefore, a double function – first to still the preoccupied mind, to empty it of triviality, to make it receptive and meditative; then to impregnate it. Illusion is the impregnating power. It is that spiritual force in dramatic art which impregnates the silences of the spectator, enabling him to imagine, to perceive, even to become, what he could not of himself become or perceive or imagine. (Ferri, 2007, p. 10, citing Morgan, 1961, p. 97)

George's practices also serve a double function in enabling the students to imagine, *even to become*, what they cannot yet imagine what being a qualified nurse in nursing practice will entail. At the same time, however, the educator's sociomaterial practices work to deflect the interferences of the uncanny on the reactions of the students and thus on his teaching practices (as described in Chapter 4). In his enactments of becoming-Malcolm, John, recognising the discomfort that the students are feeling in the uncanny simulated ward, picks up the threads of the story that the interference of the uncanny have disrupted, and, with satire, weaves them back into the patient's narrative. In his multiple performances, the huge cast of characters John plays (those on the other end of the telephone, and those who make brief cameos in the simulated ward) become familiar to the students over the semester: the hospital receptionist, the phlebotomist in the lab, the cardiologist, the busybody neighbour calling to ask whether Malcolm has his theatre tickets in his pocket and can he retrieve them, as well as all of the many enactments of the voice of the mannequin-becoming-Malcolm. This practice acts to make familiar the disturbances that the educator/mannequin-becoming-Malcolm embodies in its creepy performance of imitating a human being.

Enrolling the objects-as-practice of satire and storytelling, the nurse educators thus mobilise a mode of entropy to degrade the intensity of the reluctance of the students to engage with the uncanny lump of plastic (see Chapter 4). They encounter its

strangeness, but with the shape-shifting trickster mediation of the educators-becoming-patient, this effect gradually fades away, never to regain its power in the assemblage. The distribution of entropy in this teaching and learning encounter can also be regarded as a powerful act of resistance; in subverting the effectiveness of the mannequin to then retrieve the students from the uncanny valley, the educator/mannequin-becoming-patient assemblage distributes an *emotional mode of knowing* that allows the simulation teaching and learning assemblage to hang together.

Resistance to theatricality and dramatic creativity

Although the participants in my research project embraced the theatricality and performativity of their practices, there is a great resistance to acknowledge these in the literature. When the theatricality of simulation education is acknowledged in the literature, it is often fragmented by being separated into different categories or reduced to a measurement of student satisfaction. For example, a recent 'integrative' literature review examined the use of drama in nursing education (Arveklev, Wigert, Berg, Burton, & Lepp, 2015). Despite the aim of their study being "to review empirical and theoretical articles on the use and application of drama in nursing education" (p. e13), the authors chose to completely separate "non-dramatic role plays and simulations" and "drama", citing Bolton (1992), who influenced their decision by purportedly implying that:

> role play and simulations without the artistic underpinnings, often performed mainly for skill training, are to drama as diagrams are to visual art. These kinds of activities can surely have their place in education and training, but should not be equated with the art of drama. (p. e13)

Ironically, however, their justification for excluding such simulation pedagogies in their literature search, again drawing on Bolton (1992) and denouncing the possibility that simulation education might be classified as a dramatic art form, seems to describe quite exactly the aim of simulation, as described by the participants in my thesis:

> The dramatic context is crucial and drama always includes content, theme, substance, subject matter and curriculum. The art of drama is used in order to illuminate some truth about the world, not just for

> retrieving facts or practicing skills. The existence of drama as an art form depends on the participants' engagement in both the real and fictional contexts at the same time. … To hold both the real world and the world of dramatic fiction in mind simultaneously is the source of dramatic tension, and the meaning and value of drama lie in the dialogue between these two worlds. (Arveklev et al., 2015, p. e12)

In fact, in each of the various themes that emerged in the synthesis of their review, the authors provide examples of what the students learned in engaging in dramatic activities, and almost all of the benefits revealed in the review for the professional development of student nurses included skills specific to nursing, which is the very category that they cited in justifying their exclusion of role play in simulation learning in the first place. When does drama stop being an art form and deteriorate into being mere role play and simulation?

The most recently published best-practice nursing simulation guide suggests that "ad-libbing or delivering simulations on-the-fly with no explicit design can evoke learner anxiety, diminish engagement and active learning, and fail to meet the intended learning outcomes" (Moran et al., 2018, p. 21). However, in my observations, impromptu changes to the pre-determined scenarios often enhanced the students' learning experiences and ad-libbing was a very valuable and powerful practice in the educators' repertoire of skills. Not only was it useful for the educators to go 'off-piste', it was often also necessary. The educators had to respond quickly and adapt to the constantly shifting landscape of each scenario, the trajectory of which was often outwith their control. Although each was scrupulously planned, once the scenarios had started, the educators had very little influence on how each new group of students might react. In addition, it was not only the human actants who navigated into improvised off-script practices – the mannequin, in enacting its numerous breakdowns (the compressor leak described in Chapter 4, for example), also performed a sort of ad-libbing and going off-piste. Of course, planning the scenarios is crucial; however, the ad-libbing of the mannequins is something that cannot be planned for, per se – as a very powerful actant in this assemblage, SimMan™ cannot be guaranteed to follow any pre-determined script. Moreover, as soon as the scenario started running, each iteration of the plan was performed differently by each new group of students, forcing the educators to change

tack throughout, steering the action as close to the learning objectives as possible, but, in so doing, necessitating their dexterity in ad-libbed, impromptu performances. These theatrical practices of improvisation are enrolled as powerful actants in embodying the teaching practices that work to address the tensions that emerge in the complex unpredictability of even the most well-planned simulation scenarios.

In addition, the nurse educators, by both opposing and insisting on the creative practices of storytelling and theatricality, are resisting the binary dualisms enforced upon them by 'evidence-based practice' and 'standardized teaching'. They are implicit in both denying and embracing creativity at the same time. If we consider this tension in terms of a baroque sensibility, their artifices "elide the division between inside and outside" (Law, 2016, p. 33): they can never pretend that they can stand outside of the teaching encounter and observe – they are entangled with their art – they are *required* to surrender to it and to participate. Trickster storytelling practices share similar characteristics. As Frank (2009) writes, "one of the trickster's primary qualities is the ability to slip out of definitions that seek to limit whatever is defined" (p. 192). The nurse educators, then, in being entangled in these storytelling practices, while at the same time evading them, manage to participate in them but remain 'true' to the more scripted models of nursing education. This is a further example of how the nurse educators contend with the contradictions and tensions that emerge in the simulation teaching and learning space.

Roberts and Greene (2011) describe the "analogy of simulation as theatre" (p. 695) by making the same obvious links between the theatre and the high-fidelity simulation space. They relate this particular pedagogy to various theories of learning, but, in contrast to Arveklev et al. (2015), they do endorse "the art as well as the science within its curriculum" (Roberts & Greene, 2011, p. 696, citing Jones, 2001). This positioning creates a conflict between the opposing ideologies of the 'positivist' philosophical underpinnings they propose to be the foundation of simulation education and the usefulness of its fundamental theatrical technique in enacting the mobilisation of learning. If the practices of the nurse educators and the students in the assemblage are theatrical and performative, how can they be denied their dramatic artistry and craftsmanship?

The language that Roberts and Greene (2011) use in describing theatrical practices in high-fidelity simulation reflects the performativity of simulation learning: "Performing in front of people in a safe environment, repeated practice and taking on a new role teaches students to act, think and be like a nurse. This in turn supports student learning and enhances self confidence" (p. 694). But they also miss one important and key element: this performativity also teaches them how to *pretend* to be a nurse. And it is therein, in the assemblage of the educators' storytelling practices, entangled with the theatricality of the mannequin-becoming-patient and their theatrical willingness to suspend disbelief, that their knowledge of *becoming-nurse* is mobilised.

Roberts and Greene (2011) purport that "positivism provides the philosophical underpinning for simulation education" (p. 695), writing that:

> Learners are taught the theory behind and fundamental principles of anatomy and physiology, they then experience the application of these principles through practical experience in clinical skills labs. (p. 695)

As we can clearly see in Figure 10 (Chapter 6), the fundamental principles of anatomy and physiology of a human body are certainly not authentically replicated in the physical materials assembled as the mannequin-becoming-patient. The theory behind these principles in the simulation lab is embodied not by the practical experience in the lab, nor by the mannequin – it is the entanglements of both the scientific knowledge and the creativity of the educators and the practices that are distributed and mediated within the simulation lab that allow the theoretical nursing knowledge to be mobilised in simulation education.

What is missing in the literature is the separate, hidden, and perhaps more significant mode of knowing that emerges in this assemblage. While the nurse educators might enrol simulation to teach nursing students to act, think and be like nurses, the way in which *performativity* is entangled in this assemblage also teaches them about the *practice* of *drama* – it also teaches students to *pretend* to act, think and be like nurses. This is a particular assemblage of multiple practices that are a prominent feature of simulation education – the educators are teaching more than one set of skills at the same time – their distribution of modes of knowing are thus doubled. As such, we might wish to heed McLuhan's (1964) advice about being critical of assuming that technology

always diminishes people's depth of involvement in their work: sometimes it doubles it.

Distribution and movement: The educator as nomad

Although the sensibilities of ANT seek to resist the hegemonic binary dualisms that a reductionist approach to knowledge mobilisation produces, the same sensibilities can be enrolled to make visible the multiple doubles within the simulation teaching assemblage. It is important, however, to note that these uncanny doubles are not binary oppositions, they are not dualisms, and they do not enact a dichotomy, as there is no divide between them. It is important to emphasise that the doubles that interfere in simulation education are always in a constant enactment of presence, manifest absence and othering, and that they can be considered being "*outside and inside at the same time*" (Law, 2016, p. 36, emphasis in original).

Law (2004), drawing on the works of Verran (1998) and her exploration of the "ontonic/epistemic imaginary of Aboriginal knowledge systems" (p. 242), provides a fruitful way of disrupting the Euro-American ontological assumptions that promote binary oppositions. Their proposal for interfering with a single ontology borrows heavily from the strength of Aboriginal understandings of reality-making as being *boundless*. They also emphasise that realities come into being in the enactments of imagination, narrative, and multiplicity.

> Aboriginal method assemblage gathers and generates a rich plethora of actors of all kinds. Shape shifter, the Tjukurpa narratives are filled with them. The ancestral beings are part human, part animal, part natural, part social, part spiritual and part geographical. Expressed so, perhaps it is tempting to think of them as hybrids, but this isn't right either. It isn't right because these method assemblages simply don't discriminate in terms of Euro-American ontological categories in the first instance – so neither do they make hybrids between them. (Law, 2004, p. 133)

Similarly, the actors, part human, part mannequin, part folktale, of simulation in nursing education are exemplified in the storytelling trickster practices of the educator/mannequin-becoming-patient. By acknowledging these multiple actants and

understanding them as being performative, an understanding of the uncanny nature of simulation education is mobilised. This is perhaps why the trickster method assemblage is so useful in telling the stories of this assemblage of simulation in nursing education – it allows us to understand how the educators' practices are doubled, but in an uncanny and multiple way – they are modes of knowing that are "*more than one but less than many*" (Mol, 2002, p. 82, emphasis in original).

Breakdowns and disruptions: Toggling between the tech and the reality

Although each of the nurse educators who participated in this research enrolled very different approaches to simulation pedagogy in their teaching practices, their practices of storytelling, theatricality, and knowledge mobilisation were very similar. This congruency was exemplified in the way in which they encountered and overcame disruptions to their teaching practices from breakdowns in the technological actants. John did not like being in the same room while the students were performing the scenario, preferring to stage-manage from behind the one-way mirror in the control room. John suggested that this preference arose out of a desire to make the simulated space as realistic as possible; "they would be alone on a real ward" (John, Interview 1), but the isolation of the teaching practices served a second, perhaps more significant purpose. Because the rest of the students were observing the students performing in the simulation scenario *and* John's performance in manipulating the mannequin-becoming-Malcolm, they were privy to certain modes of knowing that the ones taking part in the scenario were not. George described how the students who were observing his practices in the control room had an advantage over the ones who were performing the scenario, suggesting that they were "probably learning more than the two that are actually in there" (John, Interview 2). During the running of the scenarios, John must also toggle between two realities – performing as multiple actors within the scenario (see Chapter 5), while continuing to teach the students who are observing. In this sense, John's teaching practices were again doubled – he was physically absent from the simulated ward, yet mobilising knowledge there by enacting these multiple performances, while at the same time teaching the observing students when his microphone was turned off.

While George preferred to control the scenarios from the laptop situated in the same room as the mannequin and to have the observing students gathered around the action, including them in asking questions, allowing them to make suggestions, and bringing

them in and out of the scenarios more flexibly, he also enacted similar practices of isolating certain points in his teaching as John did. For example, he often directed information in the form of what might be considered an 'aside', so that the observing students were 'in' on part of the lesson while the ones performing the scenario had their attention focused on the mannequin. These practices are reminiscent of a technique used in pantomime theatre, where the audience is privy to information that the main characters are not, while the trickster character keeps them informed. Not having the barrier of the observation room wall made this practice a bit more difficult for George, but, for both George and John, these theatrical practices were powerful ways to mobilise two modes of knowing at the same time.

On each occasion when the breakdown of the materials disrupted their teaching, the educators enrolled further theatrical practices that enabled them to continue to oscillate between the actual and the imaginary, and between relying on the mannequin-becoming-patient and their own resourcefulness in drawing from their past experiences of nursing practice.

> It's just what I do, it's become second nature to toggle between the tech and the reality, and it's become second nature to accept that there will be deficiencies in the technology to an extent …
>
> (George, Interview 1)

Indeed, John also enrolled similar theatrical practices when having to contend with disruptions in the technology breaking down. The barrier of the observation room wall between John and the simulated ward was often removed, particularly when the mannequin stopped working properly and he had to take on the role of performing as a character in the scenario to deflect the students' attention away from the breakdown, just as George did. Furthermore, despite the barrier of the observation room mirror, he was always present during the scenario; his presence mediated by the Smots™ cameras, the telephone, and as the voice of the mannequin-becoming-patient.

These practices of *toggling between the tech and the reality* illustrate how simulation education fluidly distributes the modes of knowing between actual and virtual, simulation and simulacra, and real and hyperreal.

The spectre of SimMan™

Hopwood (2017) provides a very useful way of thinking about how the "imaginary work" of simulation education helps to enrol "real" practices in the simulated ward:

> Despite the appeal of simulation because it keeps 'real' patients from harm, the practice architectures of clinical practice only come into being through practices that proceed as if harm could indeed happen to the 'patient'. Deliberate moves away from the 'real' (real pain, real harm) rely on further diving into the realm of the imaginary. This imaginary work simultaneously produces the fiction of the manikin as a patient with real demands, and needs. It is as much *what if* as *as if*. But, the sayings, doings, and relatings that ensue are no less real than those in any ward. (Hopwood, 2017, p. 73)

Fine (1993), in his essay on 'fictionalism', reiterates that there is "no realm of human activities, even the most serious of them, into which play and imagination fail to enter" (p. 16), and even cites computer simulation as a significant post-war example of calling on the imagination "to create a useful fiction" (p. 16) in our various scientific activities and practices. This sense that stories, narrative, fiction, and imagination are implicit in performing reality into being is something that Mol (1999) also proposes:

> Talking about reality as multiple depends on another set of metaphors. Not those of perspective and construction, but rather those of intervention and performance. These suggest a reality that is done and enacted rather than observed. (p. 77)

Dunnington (2014) writes about how high-fidelity human patient simulation "disburdens the nurse from the tensional problematic normally present in the reality of human patient encounters" (p. 20). However, in removing this "burden", she suggests, this pedagogy might also be "mis-educative" because it lacks the necessary power to provoke a sense of "responsibility, accountability, and clinical agency" (p. 20). In this sense, regardless of how faithful the mannequin is to an embodiment of a human patient, the uncanniness of the experience of simulation may render the consequences of their actions in actual nursing practice invisible. However, as Dunnington (2014) suggests, as the simulation scenario unfolds, a new "reality is made manifest" (p. 20),

and, as Baudrillard (1994) suggests, this becoming-real, as a new world of the *hyperreal*, brings with it something else – something other than the original world that the scenario seeks to duplicate.

Zombie practices and the distribution of nursing knowledges

These oscillations between the imagined and the actual are often made durable because of the zombie-like, a-mortal tendencies embodied in SimMan™. Like the un-dead, he is situated in the uncanny space between life and not-life; he can die multiple times, but the magical hidden forces of the theatricality of simulation education render him un-killable. However, it is not only the practices enacted by the mannequin-becoming-patient cyborg that are zombie-like. For example, the sternum rub described in Chapter 6 is an example of a zombie *practice*. Such practices have long since died in terms of being regarded as 'best practice' or 'gold standard' or 'evidence-based' practices, but they cannot be killed off – they endure and move relentlessly from one world to the next, haunting the practices of medics, nurses, nurse mentors, and nursing students. Each time the students return these practices to the simulated ward, they are modified, 'killed off', if you will, only to return again, like the 'undead' with the next cohort of students. The nurse educator/mannequin cyborg, as the protagonist, zombie-fighting hero, must continuously battle these zombie nursing practices that seem to continue to circulate endlessly, aimlessly, around the clinical practice network. Again, it is the enactments of the trickster storytelling and performative practices embodied by the educator/mannequin assemblages that work to resist the challenges that emerge in these encounters with outdated and undesirable zombie practices. This tendency for practices to become durable in the network reminds us of the Evidence-Based Medicine Working Group's conception of evidence-based practice – after being enlisted in the healthcare practice network, after being given purchase in the medical science discourse, it refused to die. Despite constant bombardment from opposing views, evidence-based practice continues to be re-animated multiple times, becoming a very powerful actant in mobilising others: it has become a zombie practice.

In their exploration of how the enrolment of mobile digital technology might enhance nurses' professional learning, Mather, Cummings, and Gale (2018) gathered narrative "tales from the profession" (p. 112) to demonstrate the complexity of adopting mobile technology to mobilise learning. Their study revealed that, while the nurses

acknowledged the usefulness of mobile technology, they were bound by a perceived reluctance to adopt it in their practices, as the use of mobile technologies was seen to be unprofessional and fell outside "the boundaries of appropriate digitally professional behaviour" (p. 117). The authors concluded that the perpetuation of the myth that nurses should refrain from accessing mobile technology presented a paradox in that both Registered Nurses and nursing students recognised the value of mobile technology learning in the workplace, but their professional code denied them access to it. This "missed opportunity for learning at point of care" (p. 117) seemed to arise mainly out of these "tales from the profession" that worked to maintain the perception that mobile technologies were unprofessional. As such, the nurses were reluctant to adopt mobile technologies that might disrupt the boundaries of professional practice. This illustrates a how narrative tales can also be enrolled in continuing to allow zombie practices to circulate, particularly in worlds that lack a contradicting and critical protagonist to attempt to dissolve their durability.

Emotional modes of knowing

In the analysis presented in Chapters 4 to 6, the elusive emotional knowing skills of nursing practice were also seen as being examples of nomadic practices. The concept of empathy is often positioned as one of the essential *moral attributes* (Blomberg, Griffiths, Wengström, May, & Bridges, 2016) that must be 'developed' by healthcare professionals to allow them to perform compassionate and person-centred healthcare practices. However, the definition of empathy in the healthcare literature is contested, and whether empathy can be taught is a matter that divides nursing educators into two opposing positions. It has been suggested that this controversy arises in part from the debate about whether empathy is predominantly an inherent intellectual ability to understand the emotions of others in an objective process of "seeing the world as others see it" (Wiseman, 1996, p. 1165), or whether it is an affective process of "having a matching or corresponding emotional reaction to the emotions of another individual" (van Berkhout & Malouff, 2016, p. 1) that must be acquired.

However, empathy is intrinsically entangled within nursing ideologies, and, rather than polarisation, there is paradox. According to a recent systematic review of the concept of compassion in nursing literature (Perez-Bret, Altisent, & Rocafort, 2016), the conceptualisation of empathy lacks clarity in the literature as a whole. It also seems to

be conflated with other aspects of compassion and sympathy (Sinclair et al., 2016). The sensibility of empathy is often described as being difficult to teach, however, this seems to be mostly because nurse educators have yet to find ways in which they can measure it or measure how it is learned. As Curtis and Jensen (2010) write, "the practice of teaching empathy and the techniques utilized by nursing faculty are difficult to describe and the outcomes are difficult to measure" (p. 49).

In the NMC's (2018c) professional standards, this key characteristic of competent nurses is conspicuous by its absence – hidden in the definition of 'professionalism' as a component of 'patient-centred practice', brought about by practising 'autonomous evidence-based decision-making' to ensure that nurses are 'emotionally competent, resilient, impartial, and compassionate'. Kyle et al. (2017) explore the concept of dignity and whether nursing students perceive that it is amenable to nursing education. Significantly, the students in Kyle et al.'s (2017) study suggested that learning about promoting the patient's dignity could best be mobilised by listening to patient stories about their experiences of care where they had perceived that their care was both dignified and undignified. While the nurse educators' practices in my research were very effective for mobilising empathy, in contrast, the students often avoided certain elements of providing compassionate person-centred care to SimMan™, such as never having offered the mannequin/patient a mouthwash (see Chapter 6).

Together, these observations suggest that, while it may take many years of practice to 'consolidate' the skill of emotional work, the simulation education assemblage, and the practices of those actants as they *perform* the modes of knowing, allow the object-as-practice of emotions, such as empathy, to manifest and become powerful in the simulation space. However, they also allow these emotional objects-as-practice to become distributed and mobile – in acknowledging the otherness and "*unrepresentable* absences and gaps" (Law, 2016, p. 26) embodied in the enactments of empathy, they become a resource for reflecting on "*emotional* modes of knowing and learning" (Law, 2016, p. 27). It is not only the mannequin, in embodying the human, that enacts a mode of knowing to mobilise learning about the emotional work of nursing practice; it is the nurse educators' storytelling, theatricality and the ways in which these practices are distributed in their relations with the mannequin-becoming-patient, that brings this reality into being.

Simulacra and facsimiles: The uncanny false double of simulated human patients

> *Doubles may appear to come from outside, as a form of possession, or from inside, as a form of projection. Doubles are both, and we see them as both when, as we sometimes do, we see them as devils or as dolls.*
>
> (Miller, 2008, p. 416)

All dolls are uncanny. Ironically, the more realistic the mannequin is made to seem, the further we venture into the uncanny valley, and the creepier it becomes (Mori, 1970/2012). Even as simulation education strives to make the mannequins appear to be as real-looking as possible, with props, and costumes, and moulage, they remain creepy (MacDorman, 2006; Roberts & Roberts, 2014). Just as film, "because it uses real objects in the world to create a false double" (Kingwell, 2013, p. 122) is an uncanny medium, simulated human patients, by embodying and reanimating the human corpse, also become a false double; the inanimate body come to life – a zombie object. However, because the practices enrolled in nursing simulation education are theatrical, they might be considered multiply double; to borrow an expression from Derrida, they play "a *double scene* upon a double stage" (Derrida, 1996, p. 221, emphasis in original) in that, in considering it as a narrative text, simulation education "operates in two absolutely different places at once, even if these are only separated by a veil, which is both traversed and not traversed" (Derrida, 1996, p. 221). As Mol (2002) suggests, these scenes are being enacted in two absolutely different places at once, but parallel to each other.

Many nurse educators are concerned with reductionist ideologies of 'validating' the 'fidelity' and 'authenticity' of simulators in healthcare education. Some advocate that "We need to find better ways to develop the evidence proving that simulators mimic reality, and are concerned that in the absence of proper validation we could introduce the risk of reinforcing negative learning" (Gilpin, Pybus, & Vuylsteke, 2012, p. 705). However, others argue, as the participants in this thesis do, that the realism comes from 'what they do with it', not how uncannily human the mannequin might be designed to be. As Hopwood (2017) notes:

> A realistic simulator guarantees nothing. It must be enacted into being, touched, spoken to, responded to by people who constitute each other as practitioners in their social relations and modes of discourse. (p. 67)

Implicit in allowing these multiple realities to be enacted in simulation education are the storytelling practices, and, as George pointed out in his interview, replicating nursing practice authentically is not the be-all and end-all. Part of its effectiveness as a pedagogy is particularly because it weaves fictional narratives with the threads gathered from real nursing practice. Any re-production of these narratives within a simulation scenario is a form of textual narrative, and, as Watson (2011) suggests, "In a sense, all narratives are made up" (p. 396).

This might be particularly true in virtual reality simulation learning, where the pedagogy is embodied within a "serious game" (Pelletier & Kneebone, 2016). There may be a danger, perhaps, in effectively reducing nursing care to a video game by enrolling these performative resources in simulation nursing education. That very "necessary distance" (Dunnington, 2014, p. 20) that is required to keep human patients safe while nursing students practise their skills may also be the very thing that propagates the simulacrum. This distance might radically change the nursing student's "moral proximity" (Lisle, 2013, p. 163) to the consequences of their actions. If, whenever a digital human patient, such as SimMan™, dies, you can just re-set the scenario and start over again, what is the student learning? It may be that they are learning to care, but not to take responsibility for it (Lisle, 2013).

However, the nurse educators in my research, the opposite seemed to occur, and it was the very characteristic of repetition and facsimile, and the simulacra of being able to re-start the scenario and revive SimMan™, that allowed knowledge of nursing practice to be mobilised. Colebrook (2002) describes how, for Deleuze (2005), there is an 'original' process of simulation:

> Beings or things emerge from processes of copying, doubling, imaging and simulation. Each unique work of art or each human individual is a simulation: genes copy and repeat, with deviation, while art works become singular not by being the world but by

> transforming it through images that are at once actual and virtual. (Colebrook, 2002, pp. 98–99)

Through this process of simulating nursing practice, then, the nurse educators, in enacting practices that are "at once actual and virtual", allow new "beings or things" to emerge. Here, the educators enrol these uncanny processes of transformation to open up possibilities for modes of knowing to emerge in the in-between-ness of simulation education. As John describes when he is introducing his students to the mannequin and the simulation lab, the educator-as-patient/mannequin assemblage allows the students to understand the simulacra as something between the real and the pretend, but which also allows the modes of knowing to hang together:

> The first week, you'll phone up, and you won't have done his obs. And you'll lie to Dr Carter – you'll make things up. He'll politely put the phone down … Don't lie! You haven't done his obs, but his heart rate's showing 108 [on the monitor] – that's his heart rate, that might not be his pulse. Pulse and heart rate are two different things … So, don't lie. They'll lie about the patient's name, they haven't taken a note of it, so they just make it up. So, what does that prove? You've forgotten that the cameras are watching you. There's two cameras on you, and two microphones, and eight people next door, and you've just told lies! Because you've forgotten that you're being watched. Because, as the weeks go on, this [indicates the mannequin] turns from being a plastic dummy – not into a real patient – but something in-between.
>
> (John, 15 September, Session 3)

In simulated human patient education pedagogies, there seems to be something particularly disconcerting about attempting to make the simulated human as real as possible. The rush to achieve the ultimate attainment of fidelity – or authenticity – of the embodiment of the human element in simulation seems to be a fruitless effort. Human beings are full of uncertainty and complexity – a chaotic messiness that is difficult to replicate and to embody. Kneebone, a professor of surgical education at University College London (Kneebone, 2005, 2009; Kneebone et al., 2006, 2010; Kneebone & Baillie, 2008; Nestel & Kneebone, 2010), advocates instead for adopting

hybrid practices of simulation and the real. Kneebone (2016) proposes a "democratisation of simulation, casting it as an educational resource … where imagination rather than technology becomes the determining factor" (p. 2). Kneebone and his colleagues suggest that, by combining some elements of simulation with human actors playing simulated patients, medical students will benefit by offering "a more authentic experience, tapping into many elements of actual clinical practice by requiring each learner to communicate with a human being" (Kneebone & Baillie, 2008, p. 597). This hybrid and distributed approach offers a paradoxical bridge between the 'authentic' context of the simulated ward and the 'simulated' context of the performativity of the human actors. However, what they advocate is precisely what the nurse educators in my research already practise in their simulation pedagogies; these are practices that they have been enacting intuitively all along.

Tun et al. (2015) also challenge the goal of simulation education as being to provide "complete and faithful replication of reality" (p. 159), and instead advocate for Dieckmann, Manser, Wehner, and Rall's (2007) notion of deception in simulation education, proposing that an element of "benevolent deception or 'make believe' can be introduced" (p. 164), where the student will benefit from being deceived. Thus, while the participants in my research were reluctant to be seen as 'tricking' their students, this notion of benevolent deception, evident in their theatrical practices, clearly enacted a powerful mode of knowing in their simulation pedagogies. These theatrical, trickster enactments of performativity are examples of how the baroque techniques of boundlessness and folding in the educators' teaching practices allowed the enactments of the real to be mobilised in the composite and partially connected world of the simulated ward, and thus the simulation teaching and learning assemblage to hang together.

Moreover, because the dramas that are enacted in these scenarios are constantly in a state of "folding, unfolding, refolding" (Deleuze, 1993, cited in Law, 2016, p. 43), the authenticity – or fidelity – of the simulation is not what makes it a real (re)presentation of nursing practice. Rather, as Latour and Lowe (2010) propose, by replaying each scenario multiple times, by continuing to replicate each enactment as a new iteration of the original, the real is preserved. As Hennion (2016) suggests – in the authenticity of music – "it is how music is played – and replayed – that is crucial" (p. 108). He

concludes that "performance is more relevant to music than truth" (p. 108). Similarly, in simulation education, performance is more relevant to simulation than 'truth', and it is the storytelling, theatrical practices of the nurse educators here that enact the authenticity of nursing practice into being – and it is this explicit performativity that makes this simulation pedagogy a powerful mode of knowing.

Watson (2008) provides a very useful way of linking baroque techniques to the ways in which the practices of allegory are implicit in strengthening the imaginary 'authenticity' of real nursing practice. While she relates these to academic texts, the same might be said of simulation pedagogies, particularly in relation to how 'reality' is replicated:

> As allegory, baroque realism paradoxically offers a reflexive understanding of the real, as that which is barred to us, the continuous play of signifiers constituting what we experience as reality. It is this quality of the experience of reality that is the aim for representation in a research text within the baroque. (Watson, 2008, p. 52)

Here, I suggest is where the practices of allegory are most valuable. In this thesis, the practices of the nurse educators suggest that it is the *quality of the experience of reality* that is the aim for representation in simulation in nursing education – it offers the students a reflexive understanding of the real, but one which is, as of yet, barred to them. As I suggest in Chapter 2, allegory is a story that is contrived by the author to make coherent sense of the literal – it is a fiction, but it narrates "one coherent set of circumstances which signify a second order of correlated meanings" (Abrams, 1999, p. 6). In this thesis, the nurse educators enact scenarios that are fiction, but their characters, settings, and actions are based on enactments of practices that can – and do – happen in nursing practice. Therefore, these stories always conceal a second, higher-order understanding, one that embodies a more significant message. This baroque mode of knowing allows the nurse educators to establish a 'fictitious' account of the reality of nursing practice, but one that is based on literal events, to enact an allegory of nursing practice that strengthens the mobilisation of knowledge, making it durable and allowing the experiences of reality to hang together.

Law (2009) describes how a fluid technology "changes shape", how objects might "reconfigure themselves" (p. 153) in their relations with other objects in different

spaces, and how these webs of relations are multiple. The mannequin, in reconfiguring itself, does so only by being mediated by the practices of others. Yet, in being implicit in reproducing the enactments of nursing practice, SimMan™-becoming-patient becomes a different kind of immortal – a-mortal, if you will – it has a *trajectory* (Latour & Lowe, 2010). And this trajectory, in simulation education, is entangled with enactments of performativity:

> No one will complain on hearing *King Lear*: 'But this is not the original, it is just a representation!' Quite right. That's the whole idea of what it is to *play King Lear*: it is to *replay* it. In the case of a performance, everyone is ready to take into account the whole trajectory going from the first presentations through the long successions of its 'revivals' all the way to the present. (Latour and Lowe, 2010, p. 6)

Latour and Lowe (2010) argue that all originals must be reproduced in order to survive – they must be repeatedly revived. The nurse educator/SimMan™-becoming-patient practices continually embody just that. It is through this performance of re-production that authenticity emerges: "if we stop interpreting, if we stop rehearsing, if we stop reproducing, the very existence of the original is at stake. It might stop having abundant copies and slowly disappear" (citing Péguy in Deleuze, 2005, pp. 6–7).

Because of the abundance of copies, like the reproductions of the Mona Lisa on tea towels, on coffee mugs, mouse mats, and posters, the reproductions of nursing practice embodied in the assemblage of nurse educator/SimMan™-becoming-patient are not situated in the virtual. The enactments of nursing education in the simulation lab are not facsimiles. Quite the reverse: as Latour proposes, it is the enactments of multiple reproductions of the original that make these pedagogies authentic (Latour & Lowe, 2010). Without repeated and multiple reproductions, the original ceases to exist. It is not the fidelity, or the closeness to the original, or the proximity to the actual that mobilises the knowledge of nursing practice, it is the very act of performing the (re)production of those nursing practices that endows simulation pedagogies their *authenticity*. It is in the enactments of simulating the reality of nursing practice, in the assemblage of storytelling, performance, and mobilisation that allow the *simulated* to become *real*. The *aura* of the original, as Latour might say, migrates from one parallel

world to the other. However, in the simulation education spaces of nursing education, it is the *performativity* of the enactments that exalts the creative practices of storytelling, performance, and movement to make these performances authentic. Moreover, the boundaries between the real and the simulated are not important – what is important is enacting the impression of reality. As Baudrillard (1994) writes:

> pretending, or dissimulating, leaves the principle of reality intact: the difference is always clear, it is simply masked, whereas simulation threatens the difference between the 'true' and the 'false,' the 'real' and the 'imaginary.' (p. 3)

Each of the practices enacted by the nurse educators in this thesis included some element of eroding the boundaries between the real and the simulated, the literal and the figurative, and the actual and the imaginary. Furthermore, demarcating these boundaries was not foregrounded in their teaching practices. Rather, the most powerful modes of knowing were mobilised when the practices of performativity, theatricality and distribution and movement were enacted.

Mol (2016) explores how baking a clafoutis can illustrate "*what it is to hang together* in empirical materials" (p. 242) when exploring the question of baroque coherence about how to "frame, articulate, and imagine the world" (p. 242).

> While there are many ways for clafoutis to disintegrate, then, there are also many ways for it to endure – and here endurance does not necessarily mean staying the same. A certain coherence may re-emerge in a quite different composite. (Mol, 2016, p. 256)

Here Mol (2016) highlights the durability of her clafoutis – it is made durable by being reproduced. As Latour and Lowe (2010) suggest, reproduction is the key to an object's endurance – paradoxically, for Mol (2016), while eating it causes the clafoutis to disintegrate, eating it also means that it endures:

> For the destruction implied in eating tells us that the *figure* of clafoutis only endures if new clafoutises are prepared again and again. (pp. 253–254)

As Mol (2002) suggests, good knowledge "does not draw its worth from *living up to* reality. What we should seek instead, are worthwhile ways of *living with* the real" (Mol 2002, p. 158, emphasis in original). In their storytelling assemblage in their enactments of simulations of nursing practice, I propose that the nurse educators do just that. And that these practices, while placing the educators in an uncanny paradoxical world, also tell the allegory of nursing practice. It is also, I would argue, this allegorical understanding of the reality of nursing practice, a real which is yet barred to the nursing students, that is the aim of the nurse educators' aim in (re)presenting the experience of nursing practice in simulation education. In addition, rather than the simulacrum of the simulation education assemblage distancing the students from actual nursing practice, the sleight-of-hand, "the *trompe l'oeil*, reflection, paradox", and trickster storytelling practices, drawing on what might be considered the baroque imagination, enacts an allegory '"to indicate an order of shimmering reality'" (Watson, 2008, p. 52, citing Turner, 1994).

Deleuze (2005) proposes that the filmmaker "becomes another" (p. 145) when practising the art of cinema. Deleuze's (2005) description here provides insight about why the tension between the actual and the virtual works in the nurse educators' engagement with computerised simulated human pedagogies. In being a heterogenous, baroque artwork, their entanglement with the mannequin allows the becoming of the real to manifest in the hyperreal of the simulated ward. By engaging in the making of nursing legends by 'making fiction', the scenario is inseparable from the virtual past and the actual present – by telling the stories of nursing practice, that parallel world becomes real.

This cinematic trope is also helpful in allowing us to understand the uncanny a-mortal assemblage of the mannequin-becoming-patient and how its repeated movement from life to death, to life again are bound up in the ghostly practices of suspending disbelief. Deleuze (2005) illustrates how, in a cinematic performance, this brief understanding of the fictional story enacts a new reality into being as the mobilisation of knowledge creates an additional space in telling stories of death and rebirth and death in a cinematic way. He writes:

> Between one death and the other, the absolute inside and the absolute outside enter into contact, an inside deeper than all the sheets of past,

> an outside more distant than all the layers of reality between the two, in the in-between, it is as if zombies peopled the brain-world for a moment. (Deleuze, 2005, p. 200)

This understanding of the cinematic performance as a layering of realities is helpful for us to understand how the practices of the nurse educators, as they enrol these simulation pedagogies, are occupying a space between two realities – the absolute outside of nursing practice and the deeper inside of the simulated ward, enter into contact and create a third reality – an in-between. Relating this enactment to the brain-world being occupied by zombies, however, adds further understanding to the effect of the students' willingness to suspend disbelief – because the mannequin oscillates between life and death, and because these oscillations occupy multiple realities, the students, in their engagement with the undead mannequin, allow the zombie-like practice of the suspension of disbelief to enact a powerful mode of knowing in simulated human education pedagogies.

Here is another practice in simulation education that occupies a contentious position within the evidence-based practice world. By asking the nursing students to take part in the act of suspending disbelief, the simulation learning pedagogies place them in a paradoxical space: they must engage in the theatrical tradition of suspending disbelief while at the same time relying on 'scientific rationality' to make sense of the scenario.

Many nursing academics dismiss the storytelling practices of nursing education as being 'unscientific' (Jacobson, 2000; Mick, 2000; White, 1997), proposing that they are a barrier to performing research-based practice (Hader, 2010; Hunt, 1981; Mick, 2000; Nolan et al., 1998). However, there are many who advocate its effectiveness (Berragan, 1998; Bowles, 1995; Haigh & Hardy, 2011; Mather et al., 2018; Stacey & Hardy, 2011), and others who recognise the importance of storytelling or narrative-based practice in professional practice (Brophy, 2016). Others acknowledge the complexities of professional practice and refute the reductionist ideologies that reduce 'good' practice to a hegemonic dualism of whether it is 'good' (evidence-based) or 'bad' (drawn from folklore and tradition) as a binary of 'folklore' versus 'fact' (e.g., Bleakely, 2014; Crawford, Brown, Baker, Tishchler, & Abrams, 2015; Rolfe, 1999; Rolfe & Gardner, 2005).

When I highlighted the prominence of these storytelling practices to the participants, at first, both were eager to refute this association; each was wary of being labelled a mere storyteller. This seemed to be linked to the assumption that stories are unreliable – that they are fictitious and not to be trusted, particularly in a Scottish context, where the notion of 'telling stories' is often construed as the equivalent of stretching the truth, or telling lies. This presented a tension between their trickster storytelling practices and their aim of wanting to perform high-quality, evidence-based teaching practices.

Another uncertainty that the participants described was that they were aware that they might be criticised for some of their practices, particularly trickster ones in which they incorporated humour to highlight unsafe or unethical practices. As educators with a long history of working as staff nurses, they seemed to be aware of a shift in the acceptable teaching practices of nurse educators, but they both stressed that "the way they had learned" was not unethical to them at the time, and that these practices were important and powerful moments where knowledge was mobilised and professional bonds were sealed. Significantly, both John and George included simulation scenarios where the patients had eventually died, which presented the nursing students with opportunities to consider how they might contend with these events and to imagine how they might cope with having to encounter and care for a dead person. In other contexts, for example, in Australia and Scandinavian countries, nursing students are somewhat protected from these occurrences – SimMan™ is never allowed to die, and all efforts are made to avoid upsetting the students. It is not clear whether allowing the mannequin to die is a practice that is unique to the Scottish nursing education context. While the decision to allow SimMan™ to die was sometimes planned in some scenarios (as in George's case) and sometimes this decision was made to draw attention to inappropriate or unsafe practices (as in John's case), the death of a patient is something that all qualified nurses must experience at some point, and caring for human beings does not stop at the point of death. It might therefore be suggested, then, that these often shocking and remarkable trickster practices enact multiple possibilities to mobilise knowledge, and, as such, can be considered powerful modes of knowing. Ironically, it is the most powerful practices that the educators are forced to reject, providing another example of the tension between these often-controversial trickster storytelling practices and the expectation that they must adhere to a rigid, pre-determined, and fully scripted simulation scenario.

Thus, in grappling with these hidden binaries embedded within their practice culture, the educators must contend with even further doubles within the dualist ideologies of nursing practice. It is their dexterity in oscillating between them to enrol each of the binaries together *at the same time* that resists the difficulties of contending with the precariousness of navigating these multiple worlds.

The participants in this study all regard this pedagogy as being most beneficial for learning *certain types* of skills. But they each insisted that simulation would never fully prepare the students for nursing practice. The purpose of simulation is to instil memories in the students that they can carry with them from one world to the next – to reinforce practices by repeating them in a *controlled environment* until they become automatic – like driving a car. This assumption also has its double – the students become hybrid practitioners of simulation learning and nursing practices. They must learn to pretend to practise while simultaneously learning to practise. They thereby become the uncanny double of the mannequin, then; in taking these practices forward, they engage in a cyborg activity of having learned to practise in assemblage with the false double of the patient – the mechanised patient. Much attention is drawn to the 'gap' between theory (learning to be a nurse) and practice (being a nurse) in nursing education. However;

> It may be that the experience of ontological disjunction associated with folding in that which resists resolution into familiar terms is a necessary consequence of encountering difference *as difference* – rather than as diversity, which, as we have seen, is where the new is dispersed within the familiar. The *gap*, which such an acknowledgement creates, interrupts what might otherwise appear to be a seamless translation into pre-given coordinates. Its resolution will not come through appeal to what is *already known* but only through the invention of new ways of going on. (I'Anson, 2009, p. 111, emphasis in original)

Therefore, this 'gap', while presenting as an uncanny rupture between what is known about the reality of nursing practice and the theory of what is being taught in simulation pedagogies, in being folded by the performativity of the nurse educators, is a necessary consequence of the difference between these two parallel worlds. The modes of

knowing cannot be enacted without the storytelling and theatrical inventions enacted by the nurse educators. Instead of this mythical 'gap' that divides nursing education (theory) and practice, the unboundedness of the nurse educators' practices works to draw these two worlds together, to *suture* them, in a sense, by "pleating insides and outsides together" (Law, 2016, p. 34). Here the notion of *suture* might be understood in its literal sense, but it is also often used in reference to the cinematic, a way in which film can be understood to enact the "taking-the-place-of" (Miller, 1978, p. 25) the worlds that it depicts. As "the conjunction of the imaginary and the symbolic" (Miller, 1978, p. 25), *suture* in film refers to the drawing together of what is revealed as being absent, but also to what is made manifest in the narrative.

Writing about the 'gap' that divides scientific practices and the prose of scientific reporting, Latour (1999b) warns that "We never detect the rupture between things and signs" (p. 56). This thesis, in exploring the entanglement of the more-than-human with the practices enacted in simulation education, reveals that the teaching practices embodied by the actants in this space both enrol and deflect this rupture to erode this false binary between absent nursing practice and the narratives of simulation education.

But it is the *suture* that is enacted by the nurse educators that forms the catalyst – the conduit, perhaps, for these hybrid assemblages – that allows the rupture to be folded together and repaired, and for simulation in nursing education to hang together. And they do so by engaging in enactments of storytelling, performance, and nomadic practices between multiple worlds. This mythical 'gap', therefore, is often a productive space – a space in which to "provide opportunities to think and imagine differently" (I'Anson, 2009, p. 111) – a space where room is made for knowledge to be mobilised. Wherever there are trickster practices, and particularly in the stories of human patient simulation described here, a situation arises that "suggests that we give up mastery but keep searching for fidelity, knowing all the while that we will be hoodwinked" (Haraway, 2007, p. 125). By actively engaging in practices that enact a form of *suture* between the binary distinctions of evidence-based practice and nursing folklore, the nurse educators in this thesis challenge and overturn the hegemonic forces that circulate and pervade nursing practice/education in an act of resistance that is revealed as a very powerful mode of knowing.

The patient becoming-non-human

Braidotti (2013) introduces the idea of becoming-animal in *The posthuman*: she promotes an "ethics of becoming", defining the critical posthuman subject as "an eco-philosophy of multiple belongings, as a relational subject constituted in and by multiplicity, that is to say, a subject that works across differences and is also internally differentiated, but still grounded and accountable" (2013, p. 49). She argues that, if we challenge the central positioning of the human as the measure of all things, a gap opens in our ontological understandings, allowing 'other' species to "come galloping in" (Braidotti, 2013, p. 67). With ANT, these others are not limited to species, but include objects, material or otherwise, such as SimMan™, that are constituted in and by their multiple relations between each other. In a posthuman understanding, SimMan™ occupies a position in the network that wholeheartedly endorses the post-anthropocentric turn: by practising the becoming-object of the human–mannequin relations, SimMan™, effectively also does the complete opposite. The practices of the mannequin are reversed – SimMan™ is a non-human object that embodies the becoming-human.

While the mannequin-becoming-patient might enact the posthuman assemblage insofar as the mannequin is a non-human hybrid of human and non-human practices, the same is also true of a human patient in an actual situation such as the ones that both George and John were simulating throughout. When the mannequin is programmed to go into cardiac arrest, although SimMan™ is central to the activities of the students and the educators in the room, it is mostly the extensions of the symptoms and signs of life – on the monitor, in the AED machine's voice, in the conversation between the students and educators – that become prioritised. Again, it is almost as though the mannequin is "there and not there at the same time" (George, Interview 2). In a sense, the mannequin-becoming-human retreats, and, instead, the non-human materials become more durable in the assemblage. George describes that this de-centring of the mannequin-becoming-patient is a realistic replication of what happens in real practice:

> … you know it's a person, you're trying to resuscitate them, but, at the same time, there is a – and this is the danger of it, it can be seen as being a very raw, mechanical non-human interaction … but at the

> same time, you've got to re-connect every now and again, to realise, well, this is a person.
>
> (George, Interview 2)

This de-centring of the human drives the relations between the non-human objects-as-practice into the centre in what is a paradoxical entanglement: the very act of de-centring the human patient, rendering them non-human by pushing its significance to the periphery is, ultimately, an act of practising person-centred care. Instead of centring the human, during cardiac arrest the patient is reduced to "mechanical non-human interaction" – a set of "procedural elements" engaged in a "protective mechanism", in a surprising reversal of the mannequin-becoming-patient to the patient-becoming-non-human. This reversal can often embody a powerful mode of knowing.

The fluid ways in which the educators oscillate between multiple enactments in their teaching practices address much of what Dunnington (2014) proposes about the dangers of high-fidelity human-patient simulation: that students who learn simulation may respond in "rote and mechanical ways" or may "fail to recognize variable or unique human responses upon transfer to real human encounters" (p. 20). In his interview, George suggested, instead, that, by including more of the complexities of the reality of performing these practices – the "arms, legs, face, voice" (Interview 2) of a human patient – that this "mis-educative" (Dunnington, 2014, p. 20) potential embodied in simulation education can be overcome.

Reflections on manipulating the reality of nursing practice

Each of the teaching practices that are enacted in this space – trickster storytelling, performativity, and nomadic distribution – entail some relation with performativity; between and among objects and actants, both figuratively and literally. But each is also bound up in the interferences from powerful actants that disrupt the tendency for nursing education to migrate towards dualist notions of what is real/simulated, fake/authentic, fiction/truth, and actual/virtual. The stories of nursing practice, as allegories for nursing practice, become the myths of nursing education, and particularly so for simulation education. And allegory is the tool that is enrolled in the simulation education assemblage for "arresting history and recuperating that which has been erased by the storm of progress" (Law, 2016, pp. 41–42). However unwittingly, the nurse educators who participated in this research, in their hybrid assemblage with simulated

human patients in their teaching practices, were participating in an act of resistance. By enrolling the objects-as-practice of performativity, theatricality, myth-making, and diaspora in an assemblage of allegory and storytelling, they were cultivating a baroque sensibility to give voice to the fragmented and scattered ontologies of nursing practice that have been silenced by the conventional academic ways of knowing that have bracketed, concealed, and othered them. As such, these practices are revealed to be implicit in embodying the teaching practices in nursing education.

The art and science of nursing – or the baroque modes of knowing

Pelletier and Kneebone (2016) acknowledge how the creative practices of theatricality are implicated in "enhancing or disturbing belief" (p. 385) when healthcare educators enrol simulation in their pedagogies, and make a very important point about how the art of evoking the imaginary serves to resist the danger of enrolling a simulacrum in simulation education:

> Studying medical simulation as a cultural practice demonstrates the significance of imagination and fantasy in maintaining the credibility of simulation. What turns a plastic manikin into a patient on the verge of death, or body trauma into a justification for medical intervention, is not fidelity to a hypothesized real, but rather fidelity to a set of values and cultural imaginaries. (Pelletier & Kneebone, 2016, p. 385)

As Pelletier and Kneebone (2016) suggest, "[m]aintaining a dichotomy between the real/the embodied and the virtual/the disembodied, overlooks simulation's productivity: the way in which it brings new realities into being. This is a primary concern, we would argue, in cultural studies of games and play, which focus on them as genres in their own right, rather than in relation to a presumed authenticity" (p. 368).

Throughout the analysis, I was taken by the abundance and ubiquity of creativity in the teaching practices I was observing. However, the creative practices that seemed prominent to me were also often concealed and dismissed, or unacknowledged. In my interviews with the participants, while they continuously described their practices in artistic and theatrical terms, when I drew attention to this, they quickly retreated into the rhetoric of scientific language and seemed to want to be seen to be practising reliable, trustworthy and faithful pedagogies – in other words, they wanted to be seen to have

high-fidelity teaching practices that were authentic (re)presentations of nursing practice. This placed them in the uncanny realm between having to rely heavily on the creative storytelling practices of nursing education while at the same time having to be seen to reject the same practices as being untrustworthy, unreliable, and, above all, unscientific.

This contentious positioning of their professional practices creates a tension that haunts their teaching practices: the storytelling, theatricality, and emotional modes of knowing are prominent features of the simulation education landscape, yet, at the same time, they must remain hidden and unacknowledged. The expectation is that the imaginary of practising in a simulated ward setting should replicate the known reality of the actual ward setting, and it should do so in a scientific way. Is nursing, and, by extension, nursing education, an art or a science? This question becomes irrelevant when we think of how nursing education is *performed*. The 'fidelity' of the simulations; the proximity of the scenarios, the mannequin, the props, the actors, the acting, to an idealised reality is not important. What is important is *how* it is *performed*.

In enrolling ANT sensibilities, this thesis draws attention to the creative practices of nurse educators, and, instead of pushing them to the periphery, this thesis opens up the possibility of "seeing, hearing, sensing and then analysing the social life" of these hidden and eschewed practices, – and thus "caring about, rather than neglecting them" (Mol, 2010, p. 255). In this chapter, remembering Mol's clafoutis, the story of my understanding of the practices of nurse educators in simulation education is a tale in its own right. But, as Mol (2016) says of her clafoutis, at the same time, it is possible to "draw out some of the lessons about *coherence*" that my story provides, to "partially disentangle lessons from the specificities of this case and articulate these in a way that might inspire analysis in other cases" (p. 257).

Chapter 8

Conclusion: Performance is more relevant to simulation than truth

> *Maybe this story-making quality of being is the principle magic as well as the principle illusion of our lives.*
>
> From *The Mystery Feast*, by Ben Okri, 2015

This thesis has explored how two nurse educators negotiate simulated human pedagogies in teaching how to care for human beings in clinical nursing practice. It has considered the teaching practices that are being enacted in these spaces, and has explored how nursing practice is embodied by each of the actants in this assemblage. By telling the stories of the enactments of practices that mobilise powerful modes of knowing, I have explored the challenges and tensions that disrupt these teaching and learning encounters and have revealed how the educators contend with them. I have also revealed how the dichotomies between the real/the embodied and the virtual/the disembodied (Pelletier & Kneebone, 2016) mirror the binary oppositions that continue to circulate in nursing practice and education in particular, and in many of the wider ontological and epistemological positionings that serve to other different modes of knowing, rather than acknowledge and celebrate their unique complexity.

In exploring the practices of the nurse educators, the sensibilities of ANT allowed me to perform a critical examination, challenging the reductionist tendencies of traditional research methodologies by making visible the particularly powerful enactments in the teaching and learning assemblage. The conditions that allow for these practices to come into being, however, are often hidden, denied, and unacknowledged. Nevertheless, the performative practices of storytelling and theatricality that assemble together in these spaces allow the uncanny and complex uniqueness of nursing practice to emerge, to interfere with these powerful hegemonic assumptions, and to become durable. My own conceptualisation of these ANT sensibilities also contributes to the wider field of ANT literature by illustrating how these sensibilities can be extended beyond ANT's often

rigid boundaries by being combined with concepts outwith traditional educational research methodologies to enhance our understanding of the uncanny nature of the simulation teaching and learning assemblage.

Storyteller, teacher, enchanter

Although both of the participants in this research study situated themselves in different physical positions relative to the mannequin, both of them enacted very similar performative practices. Each of them negotiated breakdowns and disruptions by oscillating between enhancing and disturbing the suspension of disbelief by seamlessly folding the real/the embodied and the virtual/the disembodied to enact a composite (Mol, 2016) of the parallel, but partially connected, worlds of nursing practice, nursing education, and student nurse practice. Each participant enrolled these practices while having to contend with the double demands of simulation teaching: to teach the students how to practise person-centred clinical skills, while teaching them how to negotiate the simulated ward learning space. But it was the sociomaterial assemblages between the educators and the other actants that also circulated within that space that allowed these uncanny teaching practices to emerge as powerful modes of knowing.

While it is important to acknowledge the sometimes-unsettling nature of the practices of the educators, it is also important to recognise how these trickster storytelling moments enacted very powerful modes of knowing by punctuating the mobilising of knowledge with strong links between nursing education and nursing practice. These events served to capitalise on the gap between these two parallel worlds, translating the interferences between them into a positive force by producing conduits between them that also acted as a rite of passage. This thesis illustrates how the uncanny disturbances, mediated by the practices of the educators/simulated patient assemblages, are productive ways of disentangling the strangely familiar messiness of nursing practice from which the students may have so far been somewhat protected – and it is the storytelling practices that address the complex uncertainty of the world that these students are about to enter.

Simulation as storytelling

There is a conflict between the embedded culture of nursing as a traditional, storytelling, performative craft, and the resistance to acknowledge the usefulness of this creative practice in its pedagogies. Despite insisting throughout the research, including

a reminder at the beginning of each new scenario with each new group of students, that I was not there to evaluate the effectiveness of the educators, or even the effectiveness of simulation education pedagogies, both participants continued, right to the end, to assume that the quality of their teaching was being evaluated. Both remarked how they had not been taught how to teach with this simulation technology specifically – that their training had mostly come from taking part in simulation education courses themselves and adopting what they perceived to be the most effective teaching methods of others. George had received formal training with Resuscitation UK, and John had made extensive use of simulation teaching models adopted in nursing and medical education, but both, independently, asked how their practices compared to the other, curious about whether they were "doing it right" (John, Interview 2). These insecurities reveal the tension between the messy and uncertain practices that they acknowledge are the most effective in mobilising knowledge of nursing practice and their perceived expectations of having to adhere to a systematic and rigidly structured pedagogy. The educators' resistance to be seen to be 'telling stories' illustrates how they are caught between the enduring binary dualisms of 'scientific truth' and practice folklore. Their reflections as they listened to the analysis of my engagement with their teaching practices strengthened the understanding of the difficulties of acknowledging nursing education as a storytelling practice.

Each participant also provided multiple examples, unprompted, of how they had observed (or proven) the effectiveness of their teaching methods; each told anecdotes of hearing afterwards, from past students, sometimes early into their nursing practice, sometimes years later, that the scenarios they had taught had been very powerful experiences in which knowledge was mobilised and how the skills that the students learned there had been made stable in the network by becoming established in the world of nursing practice. Both provided examples of how students they had taught in simulation scenarios had saved the lives of patients under their care very soon into their practice as qualified nurses because of something they had remembered vividly in these simulation scenarios, and each was related to the theatricality of the pedagogy. These examples, while perhaps offered to me as evidence of the effectiveness of simulation education, and of the educators' own teaching practices, also demonstrate the fluidity and movement of the sociomaterial practices that are enacted in the simulated ward space. The stories that they tell in teaching nursing students about nursing practice are

conveyed forward into multiple parallel worlds, but sometimes they return, as new stories, to make their teaching practices more durable and to allow the research/theory/practice network to hang together. It might also be suggested, then, in a mirroring of the practices of the nurse educators, that it is the composite of both the modes of knowing assembled in the partial connections between research-based practice and the folklore of nursing practice that allows simulation pedagogies in nursing education to traverse these multiple worlds.

This tension between the false polarisation of what counts as 'evidence-based' practice and the complexity and uncertainty that is enacted in the practices of nurse educators serves to dilute the strength of the uniqueness of nursing practice. This insistence on replicating the teaching methodologies of other professions without embracing its own unique practices thus presents a risk of perpetuating a simulacrum of nursing practice in simulation education. The insights in this research reveal the importance of allegorical modes of knowing in unifying/eroding the false binary between scientific approaches and storytelling. Because the educators' practices are inextricably linked to storytelling, their enactments in the teaching and learning assemblage present a radical challenge of the false dualisms of the understanding of scientific practice being 'pure' and 'true' that dismiss the trickster folklore practices of nursing education. By bringing together the powerful effects of evidence-based practice in a composite of these parallel worlds, the nurse educators manage to guide the students through the messy landscape of their future nursing practice. Therefore, the storytelling pedagogies of nursing education should be promoted and highlighted as the valuable and effective modes of knowing that they are, and they should be enrolled, wherever possible, as powerful ways of mobilising nursing research as well as nursing practice for nursing students.

Simulation as theatre

The resistance to the more creative aspects of nursing practice, and indeed, nursing education, have long been debated in the literature, but the trope of the 'softness' of nursing practice, and its perception as a feminine activity seem to be entangled with these powerful symbols of professional identity. However, such narratives seem to also be a metaphor for the constant friction between the educators' resistance to these assumptions and their enrolment of these elements in their teaching practices. Ironically, despite dismissing the theatricality of scenario-based simulation education,

Arveklev et al. (2015) acknowledge that "to hold both the real world and the world of dramatic fiction in mind simultaneously is the source of dramatic tension, and the meaning and value of drama lie in the dialogue between these two worlds" (Arveklev et al., 2015, p. e12). This concept is uncannily similar to the very practices that are enacted by the nurse educators in this research – the value of the theatricality of their practices lies in the folding of the partially connected parallel worlds of nursing practice and simulation education. And it is the dramatic fiction enacted by the educators in these spaces that allows these multiple worlds to hang together simultaneously. Categorizing these practices as being either truly dramatic or simulation and role play obscures the powerful and effective technique of theatricality enacted by the nurse educators in the simulation teaching and learning assemblages. Denying these practices their creative worth again perpetuates the binary oppositions of science/art, hard/soft, real/simulated within the professional practices of nurses and nurse educators and diminishes the importance that these practices have in the distribution and mediation of knowing within and across these assemblages.

Sometimes, the appeal to homogenise simulation scenarios in nursing education presents the unintended consequence of producing spaces that are simulacra of nursing practice – they simulate an original that does not exist. The paradox here is that, in attempting to perform the clinical realities into being by replicating an idealised version of nursing practice, the very purpose of producing realistic simulation scenarios is being suppressed. By refusing to acknowledge the uncanny uncertainties and complexities of nursing practice, simulation education risks distorting the expectations that students have in traversing into the clinical world after they have qualified. This thesis reveals how the assembling of creative techniques of performativity – of theatrical storytelling – allows the messiness of humans to be more authentically replicated. And it is the work of the cyborg educator-becoming-patient/mannequin assemblage that manages to achieve this desire to enact a facsimile of human patients in nursing practice. Therefore, instead of attempting to categorise and standardise these theatrical practices into reductionist categories that perpetuate the binary oppositions that continue to pervade nursing practice and education, the creativity embodied in the teaching practices in simulated human pedagogies should be acknowledged for their worth and incorporated into nursing education curricula. In addition, these practices should continue to be integrated, as the nomadic practices they are, alongside the shape-shifting

trickster storytelling practices, to assemble in embodying the folktale narratives of nursing practice.

Simulation as manifest absence and the uncanny Other

If teaching is uncanny, simulation in nursing education is doubly uncanny. Nursing itself is also a further extension of the uncanny because it is situated alongside medicine, but it is different. It is medicine's familiar yet unfamiliar uncanny other. "Something else besides" (Bhabha, 1994). Not different, but partially connected: "more than one, and less than many (Mol, 2002, p. 82). As such, although nursing might be an uncanny double of medicine, it is not othered in a reinforcement of the binary hegemonies that perpetuate scientific discourse. Instead, as the participants in this thesis have revealed, it is the storytelling practices of simulation-based nurse education that challenge the roles of the actors that work to strengthen these binaries, and to dissolve the boundaries between the mythical dualisms that circulate in the clinical practice network. The trickster practices promote the simulation teaching and learning assemblage as a "powerful mythic actor, both a hero and villain, but one whose activities are almost always activated in relationship to other figures" (Robbins, 2015, p. 93) to bend and fold the dualisms that persist to reveal and make manifest the connections between these uncanny others instead of foregrounding their differences.

There is a tension in nursing education between 'scientific' approaches, both to nursing practice and nursing education, and the folktale storytelling practices that are mobilised and distributed in these parallel worlds. If storytelling is central to human understanding (Lewis, 2011), why is it dismissed and distrusted in so-called scientific practices? Qualified nurses and nurse educators alike acknowledge that the folklore of nursing practice is where the 'real' knowledge resides. But the educators in this research, while professing 'scientific' approaches to teaching, were not able to teach without telling stories, again, indicating that the notions of evidence-based practice and storytelling are not in opposition. Stories are a crucial resource for mobilising the modes of knowing that are enacted in simulation pedagogies. In the distribution and movement of modes of knowing in nursing education, storytelling reinforces the parallel world of nursing practice and its culture, making it durable.

Interfering with the distributions between fiction and reality

> *Literature is invention. Fiction is fiction. To call a story a true story is an insult to both art and truth. Every great writer is a great deceiver, but so is that arch-cheat Nature. Nature always deceives.* (Nabokov, 1980, p. 5)

Medical simulation has been criticised for making the scenarios too clinical – too formulaic – and thus, not realistic at all (Tun et al., 2015; Kneebone, 2009). As Kneebone (2009) writes, "By making the procedure seem simpler than it actually is, task-focused simulation has left her unprepared for the complex realities of clinical care" (p. 956). By reducing the simulation of clinical practice to tick-boxes and checklists, the complexities of actual clinical practice are not encompassed in the education process. This lack of acknowledgement of the intricacies and contingencies inherent in professional practice is also seen in other professions, including teacher education, where newly qualified teachers often report that their education "did not prepare me for the uncertainty" (Britzman, 2007, p. 8).

Conversely, in simulation nursing education, at least with the participants in my research, it is the spontaneous, serendipitous, unscripted and ad-libbed creativity enacted by the nurse educators that mobilises knowledge of the uncertainty and complex realities of clinical practice. It is the creative practices of trickster storytelling, theatricality, and movement and distribution that become powerful modes of knowing in simulation education and which thus prepare the students for the complex and unpredictable uncertainties of professional nursing practice.

These practices can also be considered sets of partial connections, presenting themselves as "lying somewhere between reality and fiction" (Law, 2004, p. 69). Because they are enrolling the practices of the simulated human patient in doing so, these partial sets of connections can also be considered cyborg. As Law (2004) suggests, cyborgs are about interfering in the "distributions between reality and fiction". (p. 69). This interference is reflected in the educators' practices, in that their entanglement with the practices of the mannequin-becoming-patient are also cyborg. But they are cyborg on multiple levels. There is the more obvious, physical relationship between the educator and the mannequin, in that by performing each other's enactments of nursing practice, they become one being. However, the educators here go beyond

that – in their teaching practices these partial connections are multiple, and their entanglements with the performativity of the scenarios allow the teaching and learning assemblage to become something else – something more besides. As John said to his students, "You'll get to the stage when it's not a human, it's not a mannequin, it's somewhere in between" (John, 15 September, Session 3).

My analysis of their practices, however, reveal that the students' engagement with simulation learning provides a space in which these modes of knowing can emerge – that it is the assemblage of all of the actants in this convergence of practices that opens up possibilities for knowledge to be performed, distributed, to move, to be multiplied, to be folded, and mediated before being conveyed into the students' new realities as qualified nurses. In fact, then, simulation education goes beyond being a bridge, or a scaffold (Hopwood, 2017) between theory and practice, to engage in the performing of new realities into being by enacting the anticipation of future practice in the parallel world of nursing education. These insights show how the simulation teaching and learning space is saturated with the uncanny – but also, and more importantly, how vital it is in distributing the modes of knowing in simulated human patient pedagogies.

The skills that are most desired of qualified nurses are continually being imagined and re-imagined in concentric but dual models. For example, the importance of developing good communication skills is paramount in nursing practice, particularly in promoting patient-centred care. However, as Bleakley (2014) argues, it is worrying that such a highly complex facet of human relations is reduced to a series of "assessable 'skills'" (p. 12), arguing instead that what is necessary is "mindful presence" (p. 12). At the same time, however, he argues that such presence is not inherent, it does not lie dormant, as "a gift, waiting to unfold" (p. 12) and that it is possible to learn and develop these important professional *ways of being*.

These insights reveal that, while the educators' enactments are performative, and multiple, they also perform these enactments doubly. Not only must they contend with having to teach the students to learn about two partially connected realities simultaneously, but they must continually push back against the dualist tendencies of the hegemonic worlds within which nursing practice is situated. They must continually promote and make durable the traditional storytelling practices of nursing education

while at the same time concealing them within a reductionist, imperialist medical model of modes of knowing.

Kneebone et al. (2010) previously challenged the assumption that authenticity, or fidelity, should be the aim of the materials used in simulation education. More recently, Pelletier and Kneebone (2016) suggest that "realism is a function of the practitioner's concern, rather than the detailed reproduction of a setting" (p. 269). My analysis supports this critique, as it illustrates how it is the assemblage of the practices of the educator with the materials that should be foregrounded in promoting a sense of realism, rather than the realism of the materials on their own. However, my analysis also reveals that these storytelling practices are integral to teaching nursing students about the complexities of human bodies and professional practice – without their storytelling, the simple binary of real/simulated, facsimile/authenticity would prevail. The allegorical performances enacted in the nurse educators' teaching practices, while engaging the students in an assemblage that did not attempt to replicate 'realism' in the scenarios, *did* concern the reality of practice. Thus, simulation pedagogies in nursing education might be considered an allegory of nursing practice. The fictional tales and traditional folklore that the educators present in their performances in these simulation spaces are, nonetheless, literal (re)presentations of reality. However, the stories that these tricksters tell point to a higher-order, more significant, but imaginary, reality – that of providing competent, person-centred care to real patients in clinical practice. The simulated ward as a space of teaching and learning is saturated with the uncanny, and the uncanny is integral to making these allegorical practices hang together.

The educators themselves, while professing to enact 'scientific' approaches to teaching, are not able to engage in simulated human pedagogies without telling shape-shifter trickster stories, without theatrical performance, and without engaging with nomadic practices. This reveals how tentative and contentious the notions of evidence-based practice are within the nursing education and practice worlds. Again, this diminishes the authority that is placed on the 'scientific' approaches, indicating that the 'evidence-based practice'/'storytelling' binary is a myth. The great contribution that this thesis makes is that it shatters these mythical binary dualisms by revealing how the assumed chimera of replicating a 'true' and 'authentic' fidelity of nursing practice *can* be achieved in simulation education – but it is not achieved by attempting to (re)produce

an exact copy of ‘reality out there’, it can be accomplished instead by drawing on the uncanny, as an effect of the simulation teaching and learning assemblage, to enact the allegorical, performative, and even duplicitous practices to perform the reality of nursing practice into being.

Methodological considerations

In enrolling the ANT sensibilities of allegory, translation, and multiple worlds, I performed a praxiography of the enrolment of simulated human patients in the teaching of nursing students. These sensibilities were invaluable in allowing me to challenge the hegemonic binary dualisms that pervade and persist within nursing education and practice. These sensibilities also proved to be instrumental for opening up new possibilities for understanding the practices of nurse educators by providing me with appropriate means of allowing the hidden modes of knowing to emerge within the research assemblage. At the same time, however, the sensibilities were also invaluable pedagogical tools themselves, allowing for appropriate modes of knowing to emerge within my own research assemblages.

In telling the stories of the nurse educators, as storyteller, my research practices are also uncanny. However, enrolling the sensibilities of ANT was a particularly effective means of allowing these storytelling practices to be made manifest and become durable, strengthening the value of this research. ANT is often critiqued for not being a theory – that it does not provide a suitable framework on which we might ‘hang’ our ‘findings’ in order to ‘interpret’ them (Michael, 2017). However, the great advantage that ANT affords is that it is not necessary to draw on *a priori* theory to understand the network – the theory comes into being only by enacting the research itself (Law, 2004; Mol, 2002). For me, ANT offered a way to both immerse myself in the messiness and complexities of the simulation teaching and learning space while at the same time being very assiduous about documenting the sociomaterial relations in that space. This, itself, is an uncanny act – in my research practices, I was enacting a form of what Law et al. (2011) describe as the “*double* social life of method (p. 3). They describe how it is unhelpful to separate the theory, method, and materials of research practice, because the methods that we choose, while, they are fully of the world, they also act as a composite to constitute that world. As Law et al. (2011) suggest, “methods are fully of the world

that they are also active in constituting" (p. 5) – they are at the same time integral, yet only become real when they are enacted in research practice (Mol, 2002).

Authenticity and a truth that speaks for itself

One of the ways in which the suitability of ANT revealed itself was the ways in which my own research practices seemed to be transformed and mediated by the sensibilities I was developing under the direction of Latour (2005), Law (2004), and Mol (2002). In addition, some of the insights that emerged were also entangled with the ways in which I approached the research methods. For example, my desire to be as faithful as possible to the practices of the nurse educators, and to (re)present their practices here in this thesis, is entangled completely with the same implications that the objects-as-practice of authenticity and storytelling that the participants must constantly negotiate. This became apparent in my consideration of the practices the enrolment of empathy. In an exploration of "the uses and abuses of empathy in qualitative research", Watson (2009) writes:

> The qualitative research text also employs techniques to arouse empathetic responses in order to convince us of its authenticity. As Crapanzano says (1986, p. 52) 'the ethnographer must make use of all the persuasive devices at this disposal to convince his readers of the truth of his message, but, as though these rhetorical strategies were cunning tricks, he gives them scant recognition. His texts assume *a truth that speaks for itself* – a whole truth that needs no rhetorical support. His words are transparent." (p. 115, emphasis mine)

The same "cunning tricks" enrolled by the nurse educators in their teaching practices to mobilise knowledge of the practices of empathy are similar to those that I employed to analyse and present the insights that were revealed throughout the course of my research. In the same way that the educators enrolled trickster storytelling practices, the ANT sensibilities of allegory and translation allowed me to make visible the unverbalizable multiple worlds of simulation education, and to present them in a persuasive narrative to arouse an empathic response in the reader. As Watson (2009) suggests, "the narrative imagination is what makes empathy imaginably possible" (p. 105). Thus, in gathering the materials, analysing them, and presenting them, these ANT

sensibilities were appropriate in allowing me to make the stories of the nurse educators visible.

ANT and its limitations

An amateur in reality

Despite acknowledging the great benefits of ANT, I also found that it hindered my natural research skills – sometimes, flattening the folds of the research only served to produce analysis that was "banal" and which "pummelled" the reader into the ground at points (supervisors' feedback) instead of the eloquent analysis and writing that I usually seem to produce. Ironically, ANT's boundaries seemed almost too rigid. Its "democracy/equality" at first appealed to me, but, as I progressed along in my research, the helpful parts of ANT were that it kept forcing me to think about what the materials were doing, not simply what the humans were doing with them. In addition, it also allowed me to see how things hang together – how the reality of nursing practice is enacted in the simulation of nursing education. However, it was Mol (2002) who took this mode of knowing further to allow me to understand how the simulation of nursing practice is enacted as a parallel performance of a multiple world.

> The strength of ANT, then, is not that it is solid, but rather that it is adaptable. (Mol, 2010, p. 265)

But, importantly, ANT was a most useful research *pedagogy*! Ironic then, that in researching pedagogies with this particular set of tools, the tool I chose was an appropriate pedagogy to teach me about being a researcher. Mol (2002) illustrates how ANT can be compared to a theoretical repertoire. How ANT, instead of merely repeating what has gone before, allowed me to articulate the untold stories of these two nurse educators, to "gently shift" (p. 261) the theoretical repertoire. But the great contribution of ANT is not to seek patterns until one 'true' mode of knowing is revealed. Instead, with ANT, there is always an element of newness and of discovery as a researcher. She writes:

> One might say that, in analogy with amateurs of music, drugs or wine, researchers involved in ANT are *amateurs of reality*. Their theoretical repertoires allow them to attune themselves to the world, to learn to be affected by it. Thus, ANT resembles the props, equipment,

> knowledge and skills assembled by other amateurs. It helps to train researchers' perceptions and perceptiveness, senses and sensitivity. (Mol, 2002, p. 261, emphasis mine)

Thus, in choosing ANT, I found a way in which I might take my existing ways of seeing the world and enhancing my modes of knowing; augmenting my skills by expanding my research repertoire to improve my sense of perception, perceptiveness, senses and sensitivity as a researcher so that I am no longer an amateur in reality, but am able to attune to all of the complexities, subtleties, and multiplicities of the realities in which we engage. Further, it allowed me to perform my reality as a researcher into being. As Mol (2010) writes, "If ANT is a theory, then being an amateur of reality is not merely being an amateur. Instead, and in contrast, it is a great good" (p. 262).

Shifting my enactment of ANT sensibilities

Looking back on my own doctoral journey, I recognise that there are certain parallels between the unfolding of my own understanding of sociomaterial/posthuman inquiry and the ways in which ANT has developed and evolved over time. Drawn at first by Callon's (1986b) resistance to "imposing a pre-established grid of analysis" (p. 201) on the research 'data', and seduced by Callon and Latour's (1981) insistence that adopting the principle of symmetry makes room for challenging assumptions about how some knowledges are privileged over others, at first aligned so well with my background in postcolonial critical theory.

Adhering to the tenets of ANT also othered the very ideology that attracted me to it – the postcolonial/anti-colonial critical theoretical perspective that acknowledges and embraces difference, without marginalising the Other. Of course, objects are not our slaves; they are not being oppressed in the same way, but I found great usefulness in the idea that they and their enactments are marginalised in their importance in the research that we do. And I could see links between the ways in which the imperialist, rationalist, reductionist thought pervades educational practices – that the creative, 'soft', and folk practices of nursing education were being othered in exactly the same way that the practices of First Nations trickster ontologies are – the mobilisation of knowledge embodied within their stories has also been made invisible by the colonist/settler ideologies of the European colonisers who arrived on Turtle Island with their Enlightenment rationalist ontologies intact; ironically, however, their own folklore

hidden in exaggerated replications that persist as quaint reminders of an intrepid settler history (for example, the Scottish traditions that are considered to be more authentically Scottish than ones situated in Scotland – highland games and pipe band competitions being a case in point).

During the analysis of the participant interviews, I also realised that I was performing a simulation, of sorts, of the educators' practices, and replicating the performativity that ANT had allowed me to reveal. Making the video recordings and playing them back to the research participants was a very similar method to the de-brief sessions in the simulation scenarios. In a similar way, I was bringing the actors in the scenarios back to specific moments in their performance, to consider what they had been doing – they offered me the same information that they would expect their students to consider: What went well? What didn't go well? What did you learn and will do differently next time? This was not a deliberate attempt to imitate their teaching practices, but it revealed to me, serendipitously or not, how the sensibilities I had chosen, and the methods that I had chosen to enrol them, were keenly appropriate for exploring this particular teaching and learning assemblage.

In the past, ANT has been critiqued for placing *too much* emphasis on the non-human. and for attributing too much importance to the materials and not enough on the human (Collins & Yearley, 1992). However, this critique merely strengthens the false binary dualism of human/non-human, and ignores the co-constructive nature of the more-than-human assemblages in this teaching and learning space. In nursing simulation education research, it is the practices of a human actant, the educators, that are marginalised. That these actants are marginalised should be enough to warrant a closer understanding of how knowing is embedded in their practices. That they happen to be human actants should not preclude their importance in the mobilisation of knowledge in nursing education. By drawing on the sensibilities of allegory, translation, and multiple worlds, I opened up possibilities for their practices to be acknowledged and celebrated. By re-telling the stories of their enactments in practice of their assemblages with the materials of simulation education, the hidden and taken-for-granted relations that they enact with the materials were allowed to emerge. Furthermore, by allowing them to respond to my own narratives of their practices, they made visible further stories that

were allegorical – they allowed a deeper, hidden, more significant understanding of their enactments to emerge.

So, these ANT sensibilities provided a most useful way of becoming attuned to the practices of sociomaterial and posthuman inquiry. During the analysis, these sensibilities moved away from the symmetry advocated by early ANT writings towards Mol's (2002) challenging of the notion of symmetry, which instead pushed the logic of the enactment or performance of objects as effects of the network further – suggesting that each practice enacts its own reality into being, and that these realities are multiple rather than singular. During my analysis, Mol's (2002) proposal that these realities are enactments in practice was most helpful in allowing me to understand how the practices of the nurse educators were implicit in generating multiple realities. Here, however, I began to challenge the rigidity of ANT and often perceived its insistence on symmetry to also be an enactment of *trahison*. That to flatten is not an enactment of equity, but that things – practices – sometimes need to be prioritised to give them a 'voice' and make them visible. I realised then, however, that even the architects of ANT had responded to criticism of its seemingly totalizing determinist scheme, 'pursuing to the limit a total critique' (Lee & Brown 1994, p. 783), by discarding some elements and developing others further in practices that might be described as fluid and nomadic. This movement and distribution of the ANT-ish modes of knowing has allowed some of ANT's sensibilities to dissolve, while others became more prominent and thus more durable. This is why, perhaps, the techniques afforded in baroque sensibilities (Law & Ruppert, 2016) were so appealing to me – they gave me permission to seek a theoretical understanding that allowed me to draw on the same sensibilities as ANT, but one that could also be understood as abstract, performative, and, above all, creative.

Implications for nursing education practice

Nurse educators face a great challenge in having to perform a duplicate layer of teaching – not only do they have to enact nursing practice in order to teach students how to be professional nurses, but they also have to teach them how to be proficient *simulants* – to know how to learn to be a nurse by being good at pretending.

Mol (2002) eloquently presents how no object (no mannequin, no scenario, no simulation) is singular. That these are instead material practices; enactments that are sustained by the practices of the objects to form multiple realities. However, in

simulation education, these multiple worlds are also doubled. Not binary, but multiple, and double. What is important about this observation is the challenge that it presents to educators – they accept that they must traverse multiple worlds, but it is not widely acknowledged that these practices are also doubled. This has implications for nurse educators because, in effect, the multiplicity of their work already works on multiple levels simultaneously – but that complexity is also doubled. This means that the ontological and emotional labour – all of the labour, in fact – is also doubled. This may contribute to the reluctance of many nurse educators to want to engage in simulation – it is double the work. Nursing schools should acknowledge and appreciate the value that this labour brings to the enhancement of simulation learning and should support the funding of appropriate resources to allow for the complex demands of such a beneficial pedagogy.

While clinical educators may find some of the examples presented in the thesis shocking – and even inappropriate – the findings of this thesis suggest that protecting the students from these uncertainties and complexities may be counter-productive. The implication here is that troubling the standardised, formulaic, and pre-scripted approach to simulation education to encompass the unpredictable and messy enactments of clinical practice is a powerful means of mobilising knowledge of clinical practice. Including these surprising and impromptu events in their teaching practices is a radical move, but it has great potential for enrolling the simulation/practice gap to enhance learning. Importantly, these disturbing interferences are what allows this mobilisation of knowledge to become durable in the assemblage – by enrolling and exploiting the powerful effect of the uncanny in simulation education, these interferences enact a composite of how students learn to simulate nursing practice and what it means to practise as a nurse in the parallel world of clinical practice. Crucially, it is this enrolment of the uncanny within the simulation education assemblage that allows these powerful effects to become durable.

Implications for nursing curricula and professional education

Many of the insights presented in this thesis will be helpful for the education programmes of other professions that include simulation in their pedagogies, for example, in other healthcare professions' education. More widely, however, the findings speak to teaching itself, and contribute significantly to thinking in new ways

about the particular material entanglements in different spaces constituting professional education in any field, including teacher education, and how these influence what is learned, what is possible to learn, and what pedagogies are most effective.

Schools of nursing might consider the importance of acknowledging the hidden enactments of nursing folklore that are so integral to the mobilisation of knowledge in nursing practice. Nurse educators might try to deny the significance of these storytelling and theatrical practices, but my research reveals that simulated human pedagogies in nursing education cannot be mobilised without enacting these crucial performative practices. Those engaged in considering pre-registration nursing standards should consult with nurse educators who enrol simulated human patients in their teaching practices to make visible the mostly othered and marginalised challenges that they face in teaching nursing students to care for human beings.

Implications for further research

Similarly, more research is needed that considers the challenges and tensions faced by nurse educators in enrolling simulated human patients in their teaching practices. My early reviews of the literature revealed a great lack in empirical research that considered the unique difficulties that nurse educators face in engaging with these complex and contentious pedagogies. Most of the literature considers the implications of these pedagogies from the perspective of the students. Because the students feature so prominently in the simulation education assemblage, it would have been useful, perhaps, to interview them about how the educators' practices influenced their learning and which modes of knowing had become powerful actants in allowing their multiple worlds of nursing practice to hang together. In fact, even within the wealth of literature relating to simulation in nursing education that is centred on the students' experiences, the bulk of the literature relies on survey questionnaires and very few have explored the students' experiences in ethnographic-inspired observation studies. Even fewer have taken a sociomaterial approach.

The appropriateness and effectiveness of the ANT sensibilities that I enrolled here are indicative of their usefulness in exploring teaching and learning activities involving simulation. However, some of the insights here indicate that these research methodologies can inform about educational practice more generally. The research that I have presented here highlights that there is a need to consider more closely the

practices of nurse educators as integral objects-as-practice – to examine their unique contribution to the simulation teaching and learning assemblage in order to understand how important their enactments are in mobilising the knowledge of practice nursing. In addition, it is important to acknowledge and celebrate the performativity of nursing practice and education – further research in this area will advance our understanding of the practices of nurse educators and how they enact the powerful modes of knowing in nursing education.

Unique additions to the theatrical repertoire of nursing education

Since the introduction of high-fidelity simulated human patients in nursing education, the body of research relating to this particular pedagogy is mostly concerned with its appeal to students as a learning method, its effectiveness in reaching pre-defined learning objectives, the best way to integrate simulation into the nursing curriculum, and the effect of simulation on nursing practice (Blum, Hickman, Parcells, & Locsin, 2010). With few exceptions, not much has changed in the literature over the past decade. The emphasis continues to be placed on students' satisfaction with their learning experiences and how high-fidelity simulation scenarios increase self-confidence and communication skills. The assumption that promoting a "realistic, authentic learning environment" (Dunnington, 2014, p. 15) is the gold-standard in mobilising knowledge in nursing education is not often challenged. Very few researchers have considered the implications of assuming that the students will learn better in a technology-mediated pedagogy where the reality of a clinical situation is being (re)presented. Even fewer have considered how these assemblages of a "simulated yet authentic reality" (Dunnington, 2014, p. 15) might be influencing the ways in which nurse educators' practices are being mediated.

The insights provided in this thesis open important new questions about the spaces, relations, and modes of knowing that are generated through simulation education practices. Some of these insights apply to many learning situations, not only those that include simulation. This makes the findings of importance beyond the world of simulation education and makes a genuinely significant contribution to the literature on health professions' education. The thesis also makes an important contribution to thinking in new ways about the particular material entanglements in different spaces

constituting professional education in any field, and how these influence what is learned, what is possible to learn, and what pedagogies are most effective.

However, in undertaking this research, I have also shifted the repertoire of ANT – by refining and developing the use of allegory in and beyond ANT-inspired approaches, I have moved these sensibilities further into thinking in terms of the baroque and the concept of folds. This has implications for conceptualisations of research beyond nursing education, and indeed simulation pedagogies, in other education and practice settings, particularly when thinking about the stories being told by both humans and objects, and the allegorical significance they may perform.

Overall, the thesis makes a significant conceptual contribution to the field of professional education. The potential impact for policy makers is the critical questions it raises about the assumed effectiveness of simulation equipment in producing practice-ready professionals, and the pedagogical issues it points to that require closer examination. For professional educators, the potential impact here is to encourage recognition and pedagogical dialogue about the performative effects – the enactments of storytelling, theatricality, and distribution and movement – that are actually presented in simulation education, but rarely discussed. In addition, the revelation of the importance of exploiting the uncanny as a powerful effect in the simulation education assemblage is hugely significant and has the potential to present a radical approach to the ways in which educators enrol simulated human pedagogies in their practices.

Coda

Throughout the performance of this thesis, many materials were co-produced in the research process that are not included in this particular story. Despite this abundance, I was haunted by Latour's (2005) words: "Have I assembled enough?" (p. 136, n. 192). However, I have found solace in the words of other storytellers, reminding me of the importance of storytelling in research practices.

> *A story is not a thing – it is a perpetual potentiality.* (Okri, 2015)

Storytelling is uncanny. Teaching is uncanny. Simulated human patient teaching is therefore doubly uncanny. In this thesis, I have told some of the stories of how nurse educators navigate the multiple worlds of simulated human patient pedagogies. I have

done so by enrolling ANT sensibilities, I have enacted these co-ordination devices to sharpen my own sensitivities, attuning myself and my reader to what is going on. I have uncovered both the nodes and the links (Law, 2004) in the simulation nursing education network to make visible the performativity in the material heterogeneities of knowing (Law, 2016) that are often denied. I have intervened, not from a privileged vista, but, instead, have become assembled as *acteur-réseau* in my own "doctoring mode" (Mol, 2010, p. 266), perhaps quite literally! And I have treasured each and every *acteur-reseau* along the way.

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Appendices

Appendix 1: Participant Information Sheet – Nurse Educators

PhD Research Project

Participant Information Sheet

UNIVERSITY of STIRLING

Understanding nurse educators' practices in simulation education: a sociomaterial examination

My name is Aileen Ireland and I am currently a PhD student in Professional Education at the University of Stirling in the Faculty of Social Sciences. I have received funding to carry out this project.

I would like to invite you to take part in a project that will explore the ways in which nursing educators deliver practice-based clinical skills using high-fidelity simulation (SimMan®). This information sheet will explain what I am doing and should answer any questions that you might have about the project. If there is anything at all that you are unsure of or if you want to find out more, please do ask me for more information.

What is the purpose of the project?

This project aims to explore how nursing educators engage with high-fidelity simulated patients (such as SimMan®) to teach clinical skills in preparation for practice. This study will use a theoretical framework that is relatively new to nursing, called 'actor-network theory'. This method uses observations combined with interviews to help to show how various actors – such as students, lecturers, curriculum and technology – become connected and change one another in learning activities. You have been invited to participate because you have been identified as a nursing educator who is closely involved with the delivery of practice-based nursing skills with the use of high-fidelity simulation equipment (such as SimMan®).

Do you have to take part?

No, you do not have to take part in this project, and no one but myself, the researcher, will know if you decide not to take part. If you do decide to participate, you will be given this information sheet to keep and will be asked to complete the Consent Form and return it to me in person, or you can either post it to me or send me a scanned copy via email.

What will you have to do?

If you are interested in taking part in this project, I will be conducting observations of your clinical skills classes in which you use high-fidelity mannequins to teach clinical skills to your nursing students, as well as any de-briefing sessions that you might have afterwards. The number of observations will depend on how often you use SimMan® in your clinical skills teaching, but I hope to observe up to four classes during the 2016-17 academic year. As part of this process, I would also like to invite you to wear digital glasses to record your own audio-visual observations as you teach the classes. I will also invite you to take part in two or three interview discussions to explore interesting issues that might arise during the observations and digital glasses recordings, for example, to explore specific elements of your teaching practices that might be hidden or taken for granted. These interviews should not last longer than an hour each, and will be spread out over the academic year. I will transcribe all of the

recordings and hand-written notes myself, and the hard copies will be anonymised at the transcription stage so that you, your institution and your students cannot be identified. Any audio or visual recordings will be encrypted and securely stored on a password-protected server at the University of Stirling. Manual notes and any printed transcriptions will be kept in a locked filing cabinet. If you do agree to participate, you can withdraw at any time without giving a reason.

Has this project been reviewed by an ethics committee?

Yes, this project has been reviewed and approved by the Ethics Committee for Education at the Faculty of Social Sciences at the University of Stirling.

What will happen to the results of the project?

The findings of this project, including anonymised excerpts of data, will be reported in a thesis that will be reviewed by my supervisors, Professor Cate Watson and Dr Terrie-Lynn Thompson, and by two examiners who have been appointed by the University. The thesis will be made publicly available within the Research Depository at the University of Stirling. In addition, the findings of the project may be presented in academic journals or at conferences. A summary of the findings of the study will also be sent to all of the participants at the end of writing up the findings. However, great care will be taken to make the reported data as anonymous as possible so that no individual can be identified by others in the writings of the findings.

What happens next?

If you agree to take part, I will contact you to find a suitable time to meet with you to discuss the study in detail and to arrange for dates when it will be suitable for me to observe.

Who can you contact if you would like to speak to an independent advisor about the project?

If you have any questions about the project that I have not been able to answer, please contact my supervisor, Professor Cate Watson at cate.watson@stir.ac.uk, or Professor Mark Priestley, Deputy Dean of the Faculty of Social Sciences, at m.r.priestley@stir.ac.uk.

Thank you for taking the time to read this information.

Aileen Ireland
PhD Research Student
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email: a.v.ireland@stir.ac.uk

Appendix 2: Consent Form – Nurse Educators

UNIVERSITY of STIRLING

An exploration of knowing-in-practice: Actor-network theory and simulated patient pedagogies in nursing education

Consent Form: Nursing Lecturers

Name of Researcher: _____

	Please initial box
1. I confirm that I have read and understood the **Participant Information Sheet** for '**An exploration of knowing-in-practice: Actor-network theory and simulated patient pedagogies in nursing education**'. I have had the opportunity to consider the information and ask questions, and have had these answered satisfactorily.	
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason, without any of my rights being affected.	
3. The information I provide will be treated confidentially and will be stored securely in electronic and paper form.	
4. I give permission for the information I provide to be used in reports, publications and presentations with preservation of anonymity.	
5. I agree to take part in this project.	

_____	_____	_____
Name of Student	Date	Signature
_____	_____	_____
Name of Person taking consent	Date	Signature

Please complete two copies: 1 for participant; 1 for researcher's site file.

Please return this **Consent Form** to me, or sign and scan it and return it to a.v.ireland@stir.ac.uk

Aileen Ireland
School of Social Sciences
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Tel: 01786 466392
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Appendix 3: Information Sheet – Students

PhD Research Project

Student Information Sheet

UNIVERSITY of STIRLING

Understanding nurse educators' practices in simulation education: a sociomaterial examination

My name is Aileen Ireland and I am currently a PhD student at the University of Stirling in the Faculty of Social Sciences. Your lecturer is taking part in a research project that will explore the ways in which nursing educators teach practice-based clinical skills using high-fidelity simulation mannequins such as SimMan®.

What is the purpose of the project?

The purpose of this project is to look at how your lecturers use high-fidelity technology mannequins to teach clinical skills in preparation for practice.

Why has your class been chosen?

Your class has been chosen because your lecturers are closely involved in the teaching of clinical skills and have agreed to be observed over the course of this academic year.

What will you have to do?

You do not have to do anything – I am simply asking for your permission to use the information about the activities that I observe in writing about the research. During my observations I will be taking notes and audio-visual recordings will be made of the teaching activities in the classes. It is possible that you may be seen and heard in the audio-visual recordings, and that details of what you say and do will appear in the observation notes that I take. However, the recordings will only be viewed by me and your lecturer and will be used to help me to understand how the lecturers use the technology to teach. The notes will only be seen by me. The videos, audio-recordings and my notes will not be reproduced in any form, but I will transcribe descriptions of what happens and what people say. These written transcriptions might appear in my final thesis and any publications about the research. It is important that you know that anything that you say or do will not be considered as an evaluation of your performance and that none of the research I am doing will affect your grades or your progress through the course in any way.

All of this written information will be made anonymous while I am transcribing – no real names will be used – so that nothing can be attributed to any individual person who was present in the class. The name and location of the University and the names of the lecturers will also be anonymised. The recordings will be stored securely on a password-protected server at the University of Stirling that automatically encrypts the data. Any notes that I take and any printed transcriptions of my observations will be kept in a locked filing cabinet that only I have access to. The digital recordings will be kept safe until after the study has finished, and then they will be deleted. If you do not want anonymised descriptions of your activities to be reported, I will make sure that they are not included in any of the writing that is made public.

Has this project been reviewed by an ethics committee?

Yes, this project has been reviewed and approved by the Ethics Committee of the Faculty of Social Sciences at the University of Stirling. The Committee has approved the study and is happy for the research to go ahead.

What will happen to the results of the project?

The findings of this project will be reported in a thesis that will be reviewed by my supervisor, Professor Cate Watson, and by two expert examiners who have been appointed by the University. The findings of the research may also be presented in academic journals or at conferences, and the thesis will be available publicly on the University research depository. A summary of the findings of the study will also be sent to your lecturers at the end of writing up the findings. However, great care will be taken to make sure that no individual can be identified in any presentations or papers about the findings.

What happens next?

If you agree to anonymised descriptions of your activities being included in the reporting of this research project, please read each statement on the consent form and initial each box, then sign at the bottom that you agree.

Who can I contact if I would like to speak to an independent advisor about the project?

If you have any questions about the project that I have not been able to answer, please contact my supervisor, Professor Cate Watson at cate.watson@stir.ac.uk, or Professor Mark Priestley, Deputy Head of the Faculty of Social Sciences, at m.r.priestley@stir.ac.uk .

If you have any questions or concerns about the information in this leaflet, or if you have any questions about my research, please contact me at a.v.ireland@stir.ac.uk or call 01786 466392 and I will be very happy to speak to you.

Thank you for taking the time to read this information.

Aileen Ireland
PhD Research Student
Faculty of Social Sciences
University of Stirling
FK9 4LA
Tel: 01786 466392
email: a.v.ireland@stir.ac.uk

Appendix 4: Consent Form – Students

UNIVERSITY of STIRLING

Understanding nurse educators' practices in simulation education: a sociomaterial examination

Consent Form: Nursing Students

Please read the statements below and initial the box for each one, then sign below to indicate that you have read and understood each statement and that you agree for transcripts of your activities to be anonymised and included in the analysis and reporting of this research project. If you do not agree, please fill in the slip at the bottom of the form.	Please initial box
1. I confirm that I have read and understood the **Student Information Sheet** for **'Understanding nurse educators' practices in simulation education: a sociomaterial examination'**. I have had the opportunity to consider the information and ask questions, and have had these answered satisfactorily.	
2. I understand that my activities will be treated confidentially and that they will be anonymised so that nothing that I say or do can be attributed to me.	
3. I understand that the transcripts of the classroom activities will be anonymised during transcription and will be treated confidentially and stored securely in both electronic and paper form.	
4. I give permission for anonymised written representations (transcripts) of my activities to be used in reports, publications, presentations and teaching related to the research project.	
5. I understand that anything that I say or do will not be considered as an evaluation of my performance and that none of the information that is gathered as part of this research project will affect my grades or my progress through the course in any way.	

Alternatively, please leave the top section blank, and complete this section:

I **do not** give permission for anonymised written representations (transcripts) of my speech to be used in reports, publications, presentations and teaching related to the research project. I understand that not taking part will have no impact on my assessments or evaluations in this programme.	

_____	_____	_____
Name of Student	Date	Signature
_____	_____	_____
Name of Person taking consent	Date	Signature

Thank you!

Contact Details:

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Appendix 5: Contextual Questionnaire

UNIVERSITY of STIRLING

Participant ID:

An exploration of knowing-in-practice: Actor-Network Theory and the authenticity of simulated patient pedagogies in nursing education

Introductory Questionnaire: Nursing Lecturers

This information will only be used to provide descriptions about the study participants and the context in which the study takes place. All of your responses will be kept confidential and none of the information that you provide will be attributed directly to you.

		Please write your response in the boxes below – use the back of the page if you need more space.
1.	What role(s) do you currently hold in your institution(s)?	
2.	How long have you worked in each of your current role(s)?	
3.	How long have you been using high-fidelity simulated human patients (such as SimMan®) in teaching clinical skills?	
4.	How many high-fidelity simulated human patients (such as SimMan®) does your institution currently have in use?	

5.	How often do you use high-fidelity simulated human patients (such as SimMan®) in your lectures?	
6.	What clinical skills are taught using high-fidelity simulated human patients (such as SimMan®) in your lectures?	
7.	What qualifications do you have and when did you receive them?	
8.	Do you belong to any professional organisations? If so, which ones?	
9.	How would you describe your gender?	
10.	Please can you provide your age?	20 – 29 years ☐ 30 – 39 years ☐ 40 – 49 years ☐ 50 – 59 years ☐ 60 – 69 years ☐ Over 69 years ☐

Please return this **Introductory Questionnaire** to me in the envelope provided, or scan it and return it by email to a.v.ireland@stir.ac.uk

Thank you for taking the time to provide this information.

Appendix 6: Interview Schedule

P1 Elicitation Interview 1 – Monday 31 July 2017

[P1 2016 December 05 am video]

Start at 1:00 – Stop at 2:10

[1:56] P1 provides the voice of Bill. What is he doing here?

Question: Can you describe to me here what you are doing with your voice in your teaching practice? You do not seem to need to explain to them that you are going to do this – do you need to? Where did you learn this practice?

[2:10] P1 is silent for several seconds, and this time it is he who ignores the queries of the students in the periphery – he waits for S1 to come up with the answer to his question, "So what does that tell you about Bill's airway?" (P1), and continues to focus on the activities of the three students who have the task of making an assessment of the patient's condition.

Question: How do you choose which questions to respond to and which to ignore in the scenario? This exclusion of the observers is interesting – is it an intentional act? Is it tactical?

Start at 2:10 – Stop at 3:19

Question: Can you talk a bit more about how you use the mannequin in the scenarios? How do you decide when to emphasise its limitations and its strengths?

Question: Can you explain what facet of nursing practice is being simulated here?

Start at 3:30 – Stop at 4:07

I am interested here in how you cope with the element of uncanniness with the mannequin. Can you talk a bit here about how you cope with students who are disturbed by the uncanniness of the mannequin?

Start at 5:20 - Stop at 6:54

Question: Can you talk a bit here about how you have used the mannequin to simulate practice?

How do you make the students understand the difference between the simulation and what will happen in real practice? You shift very expertly between what is real in practice and what is being simulated. Can you talk me through how the technology helps you to navigate these spaces? How does it help you move between practice and teaching through simulation?

Start again at 6:55 – Stop at 8:07

Here P1 is shifting back and forth between teaching about what the mannequin can do and what they would do in 'real' practice.

Question: Here again you describe the difference between the physical capabilities of the mannequin and what would happen with a 'real' person. Can you talk a bit about your own teaching practices and how the mannequin helps or hinders you to teach about what they nurses might encounter in the 'real' world?

Start again at 8:08 – Stop at 9:22

Question: Can you talk a bit here about how the mannequin might disrupt your teaching practices? Can you tell me about another time where you have had to overcome difficulties such as these? What happened? What did you do?

Start again at 9:22 – Stop at 11:32

Question: Can you talk a bit here about what is happening? How do you decide when to draw on the knowledge of the observers? Can you talk a bit about how the mannequin might be affecting your teaching practices here? Can you talk a bit more about how you use your voice in this segment?

Start at 16:44 – Stop at 18:19

Question: Can you talk a bit about the laptop – how does it contribute to your teaching practice?

What about the mannequin in this segment? Can you talk about what is going on here?

Start again at 18:20 – Stop at 20:38

Question: Can you tell me a bit about how you use humour in teaching simulation scenarios?

[P1 2016 December 05 am 2 video]

Start at 6:59 – Stop at 7:50

Question: Can you talk a bit about what is happening here? What practices are you teaching about here? Can this only be taught in this simulation space?

[P1 2017 March 6 am 1B video]w

Start at 08:00 – Stop at 9:48

Question: Can you tell me a bit more about what is going on here? Why do most of the students suggest the sternum rub? Where are they learning this?

Can you think of other examples of when simulation helps you to link research and new practices? How does the mannequin help/hinder you to integrate evidence into your teaching practices?

[P1 March 7 pm 4B video]

Start at 0:00 – Stop at 7:35

Question: Each day involves at least one scenario where the patient dies. Can you talk about what is going on here?

Question: How does the mannequin help/hinder you to teach nurses to be 'kinder'? To have empathy?