

This is a section of [doi:10.7551/mitpress/11310.001.0001](https://doi.org/10.7551/mitpress/11310.001.0001)

Making & Doing

Activating STS through Knowledge Expression and Travel

Edited by: Gary Lee Downey, Teun Zuiderent-Jerak

Citation:

Making & Doing: Activating STS through Knowledge Expression and Travel

Edited by: Gary Lee Downey, Teun Zuiderent-Jerak

DOI: 10.7551/mitpress/11310.001.0001

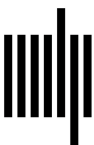
ISBN (electronic): 9780262366052

Publisher: The MIT Press

Published: 2021

OA Funding Provided By:

The open access edition of this book was made possible by generous funding from Arcadia—a charitable fund of Lisbet Rausing and Peter Baldwin.



The MIT Press

7

THE ART OF STAYING WITH MAKING & DOING

Exnovating Video-Reflexive Ethnography

Jessica Mesman and Katherine Carroll

Very cool, very nice! I am impressed by what we do every day. It's pretty complex and it's amazing that we do not make more mistakes. It is like Grand Central. There is so much going on. The Breast Specialty Council is working on trying to standardize all aspects of breast cancer care from screening through treatment for metastatic disease and I am just struck by how much of this work is already standardized. It is almost like a symphony where you have these people with this intense concentration doing their expert job in the midst of thirty people doing something with a different part of the symphony. So, it's fascinating to me, the degree to which it is already standardized and the degree to which it may not be standardizable, because it depends so much on these intensely personal communications about the individual patient.

These comments are spoken by a breast cancer surgeon during a video-reflexivity meeting where she and her clinical colleagues gathered to review video footage of their own practice as part of a study on interprofessional collaboration. The surgeon is "impressed" by what she sees and finds it "fascinating," and she uses the similes "Grand Central" Station and "symphony" orchestra to capture the clinical dynamics that the footage reveals. The event she describes arose from one of our projects in which we combine research with practice improvement in close collaboration with practitioners.¹ A growing number of STS scholars use various methods, captured under the conceptual umbrella of making & doing, to make a difference in the practices they study. In this chapter we discuss the method of video-reflexive ethnography (VRE) as one approach to STS making & doing in the midst of others that are presented in this volume.

By using VRE we aim to make and do with a lasting effect on practice. Yet to leave a sustainable mark on the ecology of practices requires methodological rigor. Traditionally this rigor is externally defined, inflexible, and applied before arrival in the field. Our rigor, however, comes over time and is generated on location from within the field. Whereas practice optimization acts as our end goal, navigating toward it

produces “collateral realities” (Law 2012) that require our attention as well. Methodological rigor, it turns out, comes with mess and vulnerabilities for all involved. In this chapter we discuss the methodological rigor that making & doing through VRE requires.

Before we dive into the matter, let us briefly introduce ourselves. We, the authors of this chapter, are (if we may say so) highly experienced hospital ethnographers in different kinds of critical care units, such as intensive care units, emergency departments (EDs), and operating rooms (ORs). We both work in the area of safety. Jessica’s work has a strong focus on why things go well despite the complexity of practices. She is fascinated by the importance of the mundane in stabilizing health care practices. She considers the ordinary to be an expression of a successful career of things and processes as because it proves their high level of integration in the fabric of practices. Katherine’s work promotes the vital relationships, emotions, materials, and practices that constitute perinatal women’s health care. By highlighting these aspects, Katherine seeks to attribute greater value to these gendered blind spots that are critical to medical care delivery and research. For more than a decade we have “made our hands dirty” (Bijker 2009, 11) and used VRE as an interventionist and collaborative method to make a difference in health care delivery. Together, despite residing on different continents, we have practiced VRE in Australia and the United States as a research team. Through our engagement with health care practices we have learned a great deal about the clinical spaces we study, and we have also learned a lot about how our professional biographies affect our ways of doing research (Carroll and Mesman 2011).

Before turning our focus to methodological rigor, we first elaborate on our main instrument for making & doing: VRE. Although aiming to make a difference and using the VRE method is not the exclusive domain of any field, the STS approach brings in specific features in doing so. Therefore, we also explicate how STS contributes to our way of making & doing practices. Conversely, making & doing projects can also contribute to the field of STS. Such contributions deserve our attention as well.

VISUALIZING MAKING & DOING

An STS approach to interventionist research positions practices at the center of its attention and articulates, among other things, their complexity, nonlinearity, and coconstructive hybrid and dynamic characteristics. Furthermore, the counterintuitive reasoning embedded in STS thinking acknowledges the importance of what is traditionally neglected, diminished, or ignored in more traditional practice improvement projects. For example, in the STS framework the mundane is not ignored but instead considered worthy of unpacking and learning from. The ordinary can be considered an extraordinary accomplishment. Ordinary daily work, as it turns out, is not a simple routine but rich and resourceful. Likewise, informal practices require

our attention because they are the glue that holds practices together. The counterintuitive way of reasoning also makes us aware of the potential of ambivalence and inconsistency in preventing practices from stalling. In other words, framing interventionist research in an STS way makes us ask different questions; it empowers us to switch lenses and see things differently. As a consequence, it articulates that “what is” has the—again, counterintuitive—potential to turn into “becoming.” Becoming harbors an openness with the potential for improvement.

The act of foregrounding what is already there to improve practices is captured in the concept of exnovation (de Wilde 2000). “Exnovation” is an aggregation of “excavation” and “innovation” (Iedema, Mesman, and Carroll 2013, 10). Excavation refers to “exposure of what is already there” and to “digging out” (10). As a product of counterintuitive reasoning, exnovation aims to excavate and articulate the existing strengths within practices. In this way exnovation sheds light on the resourcefulness and creativity of professionals in their effort to produce an up-to-standards performance in the complex dynamic of their work environment. It offers insights into their specific modes of ordering day-to-day practices (Law 1994). Exnovation, in other words, explicates competencies of coordination and alignment of modes of ordering that professionals are not always aware of (Mesman 2008). Explications of hidden constituents of practices exposes not only the complexity of practices and creativity of professionals but also the limited power of technology and formal protocols to ensure the continuity of practices (Mesman 2008). Opening up ordering processes of practices as well as studies on invisible work are well-established research topics within STS.

By exposing what is already there, exnovation acknowledges that these unarticulated actions are not only a crucial resource for the accomplishment of work but also opportunities for improvement. In its counterintuitive way, exnovation explicitly aims to improve practices by paying attention to what is *already* in place (Mesman 2011). Thus, an exnovative approach challenges (locally) dominant images of practice improvement that tend to ignore existing practices as vital resources for optimization (de Wilde 2000). Exnovation, in other words, is “innovation from within” that does not deny complexity (Iedema, Mesman, and Carroll 2013).

Our conceptualization of exnovation focuses on hidden or forgotten resources. This positive direction sets it apart from the negative version of this concept, which refers to scaling back or even taking out procedures and practices that hamper innovation. Exnovation as abandonment of existing practices to support performance improvement can be found in, for example, environmental science (e.g., Hermwille 2017; Heyen 2017), studies on innovation management (e.g., de Hoop, Pols, and Romijn 2016; Frost and McHann 2015), or health science (e.g., Rodriguez et al. 2016). We, in contrast, have adopted the version of Rein de Wilde (2000), a philosopher of science, which fits the counterintuitive way of reasoning. Compared with management and environmental literature, our use of exnovation is not aimed at taking

away but has its focus on the potential of existing practices in order to maintain, elaborate, and learn from these practices.

Paying attention to the local routines that have become invisible, hidden, or simply forgotten raises the question of how to identify these potential resources. This, we argue, requires not only insider knowledge to recognize them but also a distance to defamiliarize the usual and be able to see them in the first place. It requires a “situated distance” in which the familiar and the unfamiliar coincide (Carroll and Mesman 2018, 1152). It is here that VRE comes into play, because it enables practitioners and researchers to recognize how their everyday routine activities are an extraordinary achievement that culminate in the delivery of complex, dynamic practices.

VRE is a collaborative visual method used by researchers and professionals to understand, interpret, and optimize professionals’ work practices (Iedema, Mesman, and Carroll 2013).² VRE is both a research method that seeks new knowledge conveyed through standard scholarly outputs and an intervention in local work practices in order to create new learning and even optimize work.³ The VRE method achieves research and intervention aims through involving either researchers or professionals in filming day-to-day work and showing select footage to the professionals during video-reflexive sessions. A video-reflexive session provides participants the opportunity to view video recordings of their work (the taken for granted) in a way that offers them a new perspective (Iedema et al. 2009b). Maintaining the twin goals of scholarly research and local intervention, video-reflexive sessions generate a (re)awareness and (re)appreciation of daily routines by all involved—that is, both the professional participants and the researcher participants (Carroll et al. 2018). Thus, an important aspect of VRE is its exnovative capability: foregrounding what is already there but forgotten. For professionals, such (re)awareness and (re)appreciation of daily routines gives rise to an impetus to change, to invest or to optimize in ways of doing (e.g., Carroll, Iedema, and Kerridge 2008; Iedema and Carroll 2013). During video-reflexive sessions the researchers and professionals coanalyze the video clips in group discussions. These discussions are recorded, and the outcome of the discussions acts as further research data in addition to providing fodder for new insights and practical suggestions (Iedema, Mesman, and Carroll 2013). In other words, we consider VRE as making & doing par excellence because it combines a genuine engagement of the field of study with reflexive learning. Thus, in this casting of VRE as a possible means for making & doing, we see it as an approach to making a difference that encompasses three interrelated and often iterative phases (filming, reflexive discussions using video footage, and data collection and analysis and optimization), which seek to achieve the two aims: improvement and research. In this way VRE distinguishes itself from other visual methods, such as ethnographic film that aims to transmit anthropological insights (Ruby 2005). These films are clearly not produced to generate reflections and discussions among participants as in the case of VRE. Likewise, ethnomethodological video analysis (Sormani et al. 2017)

shares the focus on the mundane resources hidden in everyday life, but its ambitions are motivated solely by research, whereas VRE also includes practice improvement. Although visual anthropology (Pink 2013) includes video reflexivity as part of its method, it misses the parallel development of research *and* practice optimization. It is the specific configuration of characteristics like footage generated for the purpose of reflexive learning, participants acting as coresearchers, and the interrelated aims of academic research and practice optimization that differentiates VRE from other visual methods (Carroll and Mesman 2018).

VRE can be approached by the researcher in a number of ways.⁴ First, as a “clinalyst.” This notion, coined by Iedema and Carroll, is shorthand for “outsider-analyst catalyst” (2011, 176). The clinalyst catalyzes insiders’ knowledge by asking outsider questions while collaboratively recording and viewing video footage with professionals. The clinalyst is in an excellent position to question dominant understandings and generate reawareness and redefinition of the daily experience of professionals by bringing in the counterintuitive way of reasoning that characterizes STS. The second approach can be described as engaging affect as method, which foregrounds the value of VRE researchers’ precognitive affective engagement with professionals and highlights the crucial role that the affective enrollment of the researcher in the team plays in achieving VRE’s twin goals (Carroll and Mesman 2018). Third is a planned obsolescence approach, in which the researcher facilitates but ultimately leaves professionals as independent users of VRE as an established infrastructure in their daily practices (Carroll and Mesman 2018). Regardless of the researcher’s approach to VRE, VRE turns professionals into coanalysts by blurring the boundary between the researcher and professional participants. In VRE, professionals act as coresearchers from the very start because they are involved in the research agenda, the collection of video data by selecting the situations to film and where and when to film, and the analysis of the footage during the reflexive sessions.

As indicated earlier, STS frames the way we can make & do.⁵ Although one can try to make a difference in many ways, STS framing in our case has contributed considerably to our video-reflexive way of making & doing. For example, by infusing VRE with the counterintuitive notion of exnovation, our interventionist research has a strong focus on the here and now and on the positive and informal aspects of practices as potential resources for improvement. In effect, we make practitioners aware of the importance of their mundane practices and therefore suggest that some of their daily routines, such as putting on sterile gloves, be filmed and analyzed collectively. The STS tendency of counterintuitive reasoning makes us turn and again turn to capabilities instead of inadequacies and ask the question “Why do things go well, despite a complex work environment, shortage of staff, and sometimes-fallible technologies with incompatible procedures or unrealistic demands?”

STS enriches the VRE method with new ways of understanding and acting, but VRE also has much to offer STS. For one, exnovation has been adopted and further

developed by the VRE community into its methodological program (Iedema, Mesman, and Carroll 2013). Nowadays, exnovation is one of the four guiding principles of VRE (Iedema et al. 2019, 12).⁶ This indicates how the travels of STS knowledge inflect knowledge formations and knowledge making in another field and how STS knowledge itself gets transformed in the process. Let us take a closer look at what our VRE way of making & doing has on offer for STS.

MAKING & DOING AS A PASSAGEWAY FOR STS

Making & doing projects can act as very effective passageways for STS knowledge to travel on. Downey and Zuiderent-Jerak (2017) stress the importance of alternative images, infrastructures, and identity as important building blocks of the passageway on which knowledge can travel. Making & doing projects can provide these building blocks and make STS knowledge travel to new settings. In our case, the locales are as diverse as operating theaters in world-leading clinics, control rooms of railroad companies, or midwifery practices in little villages. Such a passageway is important for bringing about basic STS tenets, like the situatedness of everything somewhere and sometime, going beyond the binaries and boundaries, taking into account materiality and its agency or the importance of articulating and questioning dominant ways of understanding while being open to alternative conceptualizations of the world in which we live. Here, to elucidate a possible path that STS knowledge can travel on, we use our study on interprofessional collaboration.

We used VRE to study interprofessional collaboration between a team of breast surgeons and a team of surgical pathologists in order to identify and further enhance their already successful interprofessional practices that contribute to their timely and accurate intraoperative evaluation of breast cancer specimens (Carroll et al. 2018). We focused on their communication styles and strategies in particular. Jessica positioned herself in the OR with a handheld camera and followed staff members carrying a resected breast specimen to the Frozen Section Laboratory of the Pathology Department. Here Katherine was waiting with her handheld camera and filmed the handover of the specimen from surgical staff, the communications associated with its movement through the evaluative stages in the lab, and the moment when the final result was called back to the OR. Meanwhile, Jessica returned the OR to film the moment the surgeons were informed via the intercom by the pathologist about the results. By using two researchers and two cameras across both spatial locales, we were able to capture the intra- and interteam communications associated with each team's contribution to the successful interteam evaluation of the breast cancer specimen.

A few days later, and after our careful selection of footage that displays moments of interteam collaboration, the surgical and pathology teams were invited to view and discuss video data of their own intrateam collaboration and communication practices. Then, a few days later again, the surgical and pathology teams were

invited to view footage of interteam collaborations that depicted both the surgical and the pathology staff. Acting as chair allowed us to support participants in shifting their focus from the more traditional problem-based perspective to a strengths-based perspective and asking outsider questions. These discussions were video recorded and transcribed verbatim. These transcripts were deductively and thematically analyzed by us. In this way, our mode of doing VRE in this project involved two levels of analysis: the first is that performed by participants during the reflexive sessions, and the second is that performed by researchers when viewing the recordings of these sessions.

As part of the improvement trajectory embedded in VRE, participants were given the opportunity to identify what worked well. These reflexive moments made them aware how complex their work is (“like Grand Central” Station) and how they managed despite this complexity (“like a symphony” orchestra). A breast surgeon, observing a video of the work completed by pathology to provide a rapid intra-operative diagnosis to surgery, said, “And the other thing is how much more you guys are juggling in the lab, it’s not just the [breast surgery] specimen it’s all these other specimens coming and going and colorectal cases and gyn, and you know it’s amazing that we do as well as we do” (Carroll et al. 2018). This statement displays a realization of complexity and also includes appreciation. Building on this interteam focus, watching the footage provoked each team to realize how much the work of the other team assisted their own team’s workflow. To put it differently, a substantial part of the work of each team was intended to accommodate the tasks and responsibilities of the other team. Moreover, it turned out that their workflows were much more entangled than they had realized before. Pathology staff expeditiously call back diagnostic results to surgery. The lab team highlighted the efficiency of call backs as one way they facilitate successful collaboration with the breast surgeon team: “Communicating critical information back as soon as possible helps the surgical team know what to do. They know whether they need to re-excite the case, they know whether they are good, they can close or have plastics come in to do their thing” (Carroll et al. 2018).

In addition, the footage illuminated the value of everyone involved in specimen evaluation. All roles within the teams, regardless of hierarchy or prestige, were recognized as important for keeping the surgical practices moving (Carroll et al. 2018). As already shown, besides a reappraisal of each other’s contribution, the participants also reconceptualized parts of their practice. For example, everyone had well-defined responsibilities within each team and clearly explained them to us during our orientation to the field. However, during the video-reflexivity sessions, they began to see that their collaboration has a highly valuable imprecise structure—a realization that opposed the linear and highly mechanized way in which they had previously characterized both the structure and the workflow of their work (Carroll et al. 2018). A pathologist told us, “So even though the specimen flows linearly, actually I think the

[spatial] design is so that we can cross those lines anytime that we want and this lab in particular lends itself very well for that" (6). Although they had previously conceptualized their work as a linear flow, watching the video footage caused them to realize that pathology's achievement of a rapid and accurate intraoperative evaluation of the surgical specimens was actually based on their flexible, interdisciplinary, and cross-hierarchical web of communication and the specific material layout of their workspace (Carroll et al. 2018). Their exnovation in these reflexive sessions of what they already do so well instigated several initiatives by the surgical staff and pathology staff to further improve their interprofessional team communication. Pathologists and surgeons evidenced their redefined notion of success, shifting from primarily technology-based (high-tech lab instruments) to sociotechnical-based (lab instruments plus their own web of interprofessional communication) through the optimized changes they devised and implemented. We describe these changes in the next section.

This example demonstrates the potential to yield a reappraisal and a reconceptualization of participants, their interrelationship, and their work. The reflexive learning that is at the core of both making & doing and VRE provides a strong incentive for redefinition of practice.⁷ Viewing one's own practices from a situated distance in the reflexive sessions provides participants a space for rephrasing dominant conceptualizations of their daily practice. It is during moments of reflexive learning that participants, like our clinicians, act as coanalysts and become aware of the situatedness of their work and how, for example, quality and safety of health care are iterative doings and not outcomes of standardized behavior. As a result of this awareness, VRE provides a platform for exnovating invisible work and questioning the solidity of facts and their construction in a way similar to an STS scholar. With this we do not mean that our VRE participants become akin to STS theorists. Instead, we mean that VRE enables them to see their practice beyond the dominant dichotomized images and question this taken-for-granted view. Thus, their reflexive sessions made possible knowledge transfer—that is, the STS project helped participants in seeing knowledge content in moments that they had previously ignored or not valued sufficiently, such as their informal interteam communication.

In sum, just as STS contributes to VRE, VRE has the potential to offer STS a fertile ground that allows notions, like exnovation, to develop into a methodology to open up practices in a counterintuitive way. Furthermore, VRE acts as a passageway that STS knowledge can travel on. What's more, our making & doing project provided us, as STS scholars, a way into day-to-day practices to reflexively learn about others and ourselves. STS scholars in their making and doing are, we argue, open to transformation—not just of the methodology and what that may do for the field site but also as scholars and coresearchers who have to do and redo practices in response to and as a result of their embeddedness in the methodology. Thus, our making & doing is more than the analysis of knowledge practices or practice optimization. It is also STS in action: as STS scholars, we are actively redefining practices, skillfully

sensitizing practitioners, and emancipating by collaborating and working from the bottom up. In other words, making & doing is for us a way to open up the black box of doing STS. What kinds of insights does this yield? Where are the fault lines and frictions when being STS-ish? While making and doing we were forced to look carefully at what happens when our STS research and intervention practices met with the practices of those who would not necessarily characterize their work through the lens of STS, and then we had to subsequently deal with emergent situations or understandings. Reflecting on these moments therefore can yield insights relevant for the wider STS community.

MAKING A DIFFERENCE: NOW AND IN THE FUTURE

Practices of STS making & doing not only blur the boundary between researcher and participant but, as our example of interprofessional collaboration shows, also can dissolve the distinction between knowledge generation for the purpose of academic research and practice optimization (Carroll and Mesman 2018). Making & doing, we argue, offers us as STS scholars a *means* to enable professionals to engage with their own practices in new forms that provide ways of redefining problems, problem spaces, and timely solutions. In this section, we outline three interrelated aspects of making & doing through VRE: a fast track, a track into the future, and a solid track.

REFLEXIVE LEARNING IN THE NOW MAKES A DIFFERENCE

In terms of making a difference in the now, the surgeons and pathologists in our study made use of the video data depicting their daily routines and then their reflexive discussions that led to their new insights to further improve their collaborative practices. The counterintuitive turn of their focus toward the strength of their ordinary day-to-day practice shaped the intervention measures that the pathology and surgery teams derived for themselves and then implemented. These measures were based on reflexive learning, and as a result the teams decided to make adjustments to clarify their interteam communication practices. First, they sought to more clearly and consistently communicate the orientation of the breast specimen (once removed from the body) in relation to its origin (the patient's breast) by developing a written template to accompany the specimen. Second, they improved the call-back protocol by designing a standardized confirmation and validation procedure that applies for both teams (Carroll et al. 2018). Importantly, these improvements were implemented within a few months of engaging in VRE.

The study on interprofessional collaboration between surgeons and pathologists shows how exnovation and reflexive learning can provide new directions and practical suggestions for practice optimization in the here and now, because suggestions for improvement are generated in the reflexive sessions and can be followed up instantly

(Carroll et al. 2018; see also Iedema and Carroll 2013). This immediate effect debunks the idea that scholarly intervention can contribute only somewhere down the line, following research reports that are supposed to have impact after the scholar has long left the scene (Grol et al. 2013). Fortunately, there is no need to wait for research evidence to make its way through peer review, publication, dissemination, and then implementation and change, because making & doing with the help of VRE provides a fast track.

VRE, as one example of making & doing, decreases the waiting time for impact because it removes the detour via research reports, policy notes, and implementation guidelines along which improvement initiatives have to travel. If successful, the impact of our way of making & doing happens while we speak in reflexive discussions that generate learning. Our VRE experience has demonstrated that concrete practice improvement can be implemented within a few months (Carroll et al. 2018; Iedema et al. 2019). In this way, making & doing projects can offer a fast-track intervention that enables us to make a difference in the here and now, instead of the estimated “17 years” from now (Morris, Wooding, and Grant 2011).

The idea of recasting intervention as something other than a linear process of design, data collection, analysis, and implication strongly resonates with STS sensibilities about the nonlinearity of knowledge and technology development. Expressed by Zuiderent-Jerak’s (2007) notion “preventing implementation,” making a difference is considered a form of ongoing reflection with a focus on the specific conceptualization and framing of everyday practice. Such reflections require a space in which the taken for granted can be questioned. Video-reflexive sessions are such a space. Here, in the dynamic and unpredictable flow of coproduced knowledge, new initiatives for change arise. Casting knowledge development as nonlinear implies that impact can’t be scheduled into the future. Instead, it is scheduled in the present. Yet, making an impact in the present is one thing; making a permanent mark in the ecology of practices is another. We therefore describe the art of staying as it relates to planned obsolescence, one of the modes of doing VRE. Planned obsolescence has the potential to affect further travels of STS knowledge beyond the immediate moment. A significant detail here is that “change is in the first instance about exploring the soil from which innovations need to grow, more so than the innovations themselves” (Iedema, Mesman, and Carroll 2013, x). In other words, for STS knowledge to travel and have an effect in the present as well as beyond requires, first and foremost, a strong foundation. To underline the relevancy of the explorations of the soil we describe our groundwork (Phase 0) in detail at the end of this section.

THE ART OF STAYING BY LEAVING THE SITE

The dominant approach to practice improvement is based on the position of an external proposal by a change agent. However, in our VRE example, making & doing generates bottom-up improvement measures tailor-made to the local situation, and those involved are highly motivated to implement them. Thus, this form of making &

doing contributes to self-governance through its reflexive learning. Self-monitoring through collaborative, structural reflection and the VRE mode of planned obsolescence provides the best option to empower professionals (Mesman 2015). Interestingly, planned obsolescence was never *planned* to be. Instead, it is the spontaneous outcome of our making & doing by clinician participants themselves.

Vignette: The Birth of Planned Obsolescence

Jessica was filming doctors and nurses for a study on patient safety in a Dutch neonatal intensive care unit (NICU). Together with a small team of clinicians (the video team), she selected the footage, organized and chaired the reflexivity sessions, and taped their discussions, thus making visible the unintended and unplanned patterns of backstage processes of “doing safety,” which subsequently the clinicians could explicitly articulate. The discussions during the reflexive sessions proved to be relevant for her research project and provided the NICU staff an opportunity to improve their practice on a tailor-made basis. However, because of teaching obligations Jessica was not able to be present on the ward for several months in a row. During these months the reflexivity sessions were canceled because she was not there to prepare them. The reflexivity sessions were clearly dependent on her time and presence in the NICU. Everyone was frustrated that there were no reflexivity sessions while she was away. And so, during her absence, the members of the video team had taken action and made the method theirs. Jessica’s absence, it turned out, had created room for a redistribution of roles and responsibilities that, in hindsight, has benefited the development of VRE method in an important way, because a new mode of doing VRE was born. (Adapted from Mesman 2015, 188)

The premise of planned obsolescence—that VRE ultimately becomes a structural element of the professional’s teamwork—is that the presence of a researcher is ultimately obsolete. One may be concerned that without the presence of a researcher the scope and practice of VRE may be laid down only along normative lines as defined by those in positions of power. This is not the case. VRE is more than a bundle of audiovisual technologies. Not only is the locus of control and ownership of the project relocated from the researcher to the professionals themselves but so too is the mode of doing VRE—that is, the transformation of professionals into clinicians who maintain a constant tension between critique, interpretation, analysis, questioning, and concluding (Iedema and Carroll 2011).

Planned obsolescence is permeated by the ideology of empowerment (Pink 2013) because it positions the participant at the center of knowledge production. To realize this ambition the researcher will facilitate professionals implementing VRE in a way that ensures the method becomes theirs. For planned obsolescence to be successful, training of professionals and structural resources, like time and thus money, are needed to secure methodological durability. Planned obsolescence results in a small number of professionals who form a team and come together at regular intervals to

meet, evaluate, and organize their reflexive learning sessions and take the responsibility for videoing, facilitating the reflexivity sessions, and following up on practice optimization. Importantly, for STS knowledge to travel into the future, this team needs not only to master techniques of videoing and editing but also be able to prepare and chair the reflexivity sessions. This includes having the ability of a clinicalist to ask outsider questions and provide a counterintuitive focus that allows a questioning and redefining of the day-to-day practice. By turning professionals into clinicalists, we as STS researchers become obsolete and can leave the site. What stays behind as a structural mark is the attention for the untapped potential, for new ways of restructuring their working environment, and the act of constructively questioning dominant ways of working and reasoning about matters of fact and concern.

A FAST TRACK REQUIRES A SLOW ENTRY

Reflexive interventions, like our VRE studies, require a solid foundation to have a lasting impact. They require local adjustments and inclusion of professionals in the study design. Collectively, this means working with an evolving research project. Descriptions of this preparatory work remain a blind spot in the VRE literature.⁸ Although much attention is placed on the use of the camera, the happenings during reflexive sessions, and key facets arising from data analysis, VRE's extensive time line is only alluded to. Here we acknowledge the groundwork upon which VRE rests in order to be successful. Only after this groundwork is established can researchers enter the field with a camera—that is, only when professionals are prepared for the visual medium to be used by researchers in their place of work. Thus, VRE is not about the power of the visual but the power of the visual that rests on the care and collaboration ingrained within the supportive infrastructure. Our claim is that preparation of supportive infrastructure is foundational for the success of the VRE intervention and therefore may also deserve ample attention in other STS making & doing projects.

Building supportive infrastructure can be thought of as a Phase 0—that is, before one really starts. Yet the term “Phase 0” could also mislead because it gives the sense that the phase is complete upon entry into the field. Preparation is not simply a stage before the start; it continues throughout the whole project. For example, researchers need to do iterative preparatory work to ensure that both the researchers and professionals and their practices are kept open for negotiation. Furthermore, researchers have to be sensitive about the needs and requirements of the practices they study and maintain relations with participants such that there is acceptance of being talked to, willingness to be filmed, and openness to change things during the entire project.

The preparatory work involved in VRE is varied and depends on the existing relationships with those in the field site and the type of VRE format.⁹ However, preparatory work typically involves a myriad of practical tasks, education, and relationship building (see Iedema et al. 2019) as the following vignette reveals.

Vignette: How We Enact Preparatory Work as a Methodological Principle of Rigor

The groundwork undertaken by Katherine in preparation for a VRE study in a large hospital in the US Midwest spanned the months that preceded seeking human research ethics approval and continued after approval was gained. First, after expressing her wish to combine her interventionist strategy of VRE in a high-technology area of women's health, Katherine was introduced to the *senior clinicians* in the breast surgery unit and pathology laboratory through a mutual colleague. The mutual colleague set the scene by endorsing the researcher and VRE. A formal meeting was instigated where Katherine introduced herself and the VRE method. To assist in VRE's introduction, she brought along copies of published peer-reviewed VRE articles in the area of clinical application (pathology) and the topic of interest (communication).

The clinician-stakeholders expressed interest in being involved and suggested that Katherine as the researcher present the project and method to the *broader clinician surgical team*. Katherine put together a short presentation that included photographic and video footage depicting how VRE was typically used. The senior clinical stakeholders scheduled a time for her to make her presentation and introduced her to their team. This had the effect of supporting the researcher and endorsing both her and her research to the team. The process was repeated for the pathology team.

Here we see that the clinical stakeholders are already becoming part of the research team much before the camera enters the field or footage is watched for coanalysis in reflexive sessions.

After approval in concept by the surgical and pathology teams, it was decided by the clinician stakeholders that the researcher must report to their *senior surgical management* to have in-concept approval for video in the operating theater. The researcher and representatives from the stakeholders attended a meeting with senior hospital surgeons and management about the project and answered questions.

With blessings in hand from the clinical side, it was time to return to putting pen to paper and apply for *human research ethics approval* through a collaboratively designed research proposal with clinical partners. The researcher drafted a proposal and the logistics of when to film, where to film, how much to film, who was to film, and the time line for filming and reflexive sessions was carefully negotiated with the clinical stakeholders.

To inform the writing of the research proposal, the researcher observed in surgery and pathology for three days to understand the workflow and physical layout of the would-be research setting. She made sure that clinician stakeholders were consulted as decisions were being made that might influence the practice. Human research ethics approval was granted.

It may seem that this was many steps of administration and orientation. Yes, it was. However, equally importantly, these steps were about relationship building and providing collaboration, responsiveness, and trustworthiness on the part of the researcher, who was asking to be invited into the clinical space to film and engage clinicians' time in reflexive viewing of video footage.

Once human research ethics approval was granted, it was time to disseminate the study to the *broader team*. The clinical stakeholders continued to support the researcher in this endeavor by arranging information-sharing sessions with clinical staff in surgery and pathology and being present to introduce the researcher and the research to the clinical teams. They remained present while the researcher made the presentation, fielded questions, and asked for initial consent. Their presence enabled senior clinical stakeholders to gauge how their staff were receiving VRE as a method and the researcher as a person who would be working closely with them in their workspace.

After introductory meetings, numerous emails and presentations, discussions of drafts, five consent sessions across surgery and pathology, and researcher orientations to their clinical spaces, clinician stakeholders and clinical staff had already spent between sixty minutes and fifteen hours (depending on their role) in the presence of or having direct contact with the researcher before she even entered the field to begin the task of a VRE study.

This kind of information is usually left off the methodological detailing in published articles. We argue that in some making & doing projects, such as VRE, such infrastructure crucially supports the intervention. Downey and Zuiderent-Jerak (2017) stress that we need to take into account the "ecologies" that we encounter while making and doing. As the vignette clearly shows, the medical setting has a clear hierarchical ecology. Up, up, all the way up and down again, all levels have to be on board and require their own specific strategies and allies. Thus, the preparation is not a separate part—as in, before you start using XYZ, you have to do ABC—but a vital part of VRE as a making & doing project. Actually, Phase 0 is what turns professionals into coresearchers and, even more, develops a team of engaged coresearchers. For making & doing, this groundwork is both foundational and on location, and, as we argue in the next two sections, this local and immediate character of our way of making & doing comes with (un)expected opportunities and challenges.

COLLATERAL REALITIES

Having an impact, we argue, requires a solid foundation. Our previous account of the preparatory work done for the study on interprofessional collaboration suggests an orderly and methodological cleanliness. However, while actually doing research and the preparatory work that comes with it, we produce more than we are aware

of. Making & doing could be considered as performative in its own way, and being performative, it creates “collateral realities” (Law 2012). How can we find out about the realities that we produce and their implications? The majority of our projects are completed on location, where our ways of making & doing are laid bare, in real time, in front of the professionals. What are the politics of the realities that we produce? Which distinctions do we produce? These important questions imply a situated exploration of our own unintended consequences.

METHODOLOGICAL FOUNDATIONAL IS DEEPLY MESSY

The description of Phase 0 shows how the setting up of infrastructure was made quite visible to senior clinical stakeholders who themselves also contributed to the project infrastructure’s strength and form. Rather than being presented as a preformed, coherent, and fixed research method,¹⁰ Phase 0 of VRE could be considered as coherent and flexible—that is, a consultative and collaborative research method. In practice this implies that preparatory work involves an informal transitional process in which we need to learn the cues of professionals and get a sense of their practice: who is doing what, when, and where. During Phase 0 our work is not sanitized in the way published accounts convey (Law 2004; Plows 2018). All our moves—back and forth—are in the open and are on display. Take, for example, our filming—and being advised by participants of where and when to film—in a project on improving clinical handovers in an Australian emergency department (ED).

Vignette: Commencing Video Recording in the ED

In order to film handovers of patients, we first had to find out what time and location the handovers are usually done to be able to capture them on film. We were advised by the ED staff to stand in the middle of the ED’s workstation to be on the spot with our camera when handovers happen during the day. However, handover moments, as it turned out, are not always self-evident. In fact, many discreet and informal event-triggered handovers were happening, and we were not always able to recognize them. This resulted in filming colleagues in conversations that we incorrectly identified as handovers. Obviously, we then stopped filming and apologized the moment we realized what was going on. We found ourselves wondering if clinicians were doing a handover, just talking to each other about practical matters, discussing a patient, their Saturday evening plans, or a combination of all of the above. When we did recognize the right handover moment, we were often too late to capture the handover on video. (Adapted from Carroll and Mesman 2011, 162)

Our vignette details how as researchers we were required to learn how to recognize both formal and informal handovers, which was not easy! As we tried to get a sense of their communication practice, they could see us quite literally running around

with a camera, filming, interrupting, and then quickly apologizing for filming the wrong conversation or missing the right one or being too late. Despite this, we argue that our collaborative production of an infrastructure created through action actually produces solid ground for this type of making & doing research: relationship building comes with a cost—that is, both an exposure of and an inclusion in, our Phase 0 orientation practices of VRE.

Preparatory work for building robustness in VRE research is both methodologically foundational and deeply messy. Given that context and social history define “mess,” is mess always messy? Following Douglas (1966), isn’t mess just “method-out-of-place”? Or take one more step and follow John Law’s (2007) adage of “let’s not repress mess.” Instead, Law argues, method should be messy, because that is what research is, that is what the world is: complex and messy. Although embarrassment and joyful laughter took turn in our responses to our own trials and errors through mess, it was through these actions that we made ourselves open and ready for unpacking the slippery, non-coherent, fuzzy (medical) world of communication *with* our clinician participants. Yet as we continued to find our way, we dragged more mud onto the carpet (Geary 2018). Let’s return to the Australian ED.

Vignette: Donned in Scrubs

We anticipated that we would wear smart-casual street clothes to the hospital. However, one of the key gatekeepers of the operating theater suggested that we should wear the blue theater scrubs that all theater staff wear. This was suggested so that we could easily film the handovers as we followed patient trajectories from the ED to surgery without having to change into theater attire. Indeed, this was a very practical suggestion. So from the first until the last day of videoing, we donned theater scrubs at the start of each shift and entered the ED. The key gatekeeper was correct. We found that wearing theater scrubs assisted our access to the ED. For instance, without scrubs, if we left the ED and then wanted to later return, we had to wait for staff to note and then approve our reentry into the ED. Our scrubs assisted our access because wearing the scrubs alone was reason enough for the ED staff to open the door! By wearing scrubs, we transited from being “outsider” researchers to being legitimate entrants into the ED, therefore diminishing an “us-versus-them” appearance. We also became less “visible” and more official to patients and their families. Our scrubs made patients think we belonged to the hospital staff, and this meant that we made a seamless transition as we joined other staff behind the curtains to hear patients recount their injuries or ills to the ED staff. Thus, in the absence of a video camera or a written or verbal statement of our research project, for the patients we were just one of the many ED staff.

However, we felt that our outer appearance of being insiders was not working at all with our inner selves as ethnographers.¹¹ We had angst over our not

having enough time to form genuine relationships with people to begin to be considered as insiders. Although our wearing scrubs assisted us with insider status, we also felt they were a Band-Aid for our lack of time to gain access and build genuine and honest relationships.

Method comes with mess, argues Law (2004, 2007), and we agree happily and, as he does, do not equate a mess with poor research. Producing mess comes in different forms, such as confusion and discomfort that affects everyone involved, including us. But our maneuvering with mess also had the effect of ironing things out and building up trust, which contributed to robustness. For example, our wearing of scrubs also became an opportunity to rearticulate our researcher identity to clinicians who did not know otherwise. Messes, in other words, are ruptures in the organization that offer opportunities for relationship building. When staff from the surgery department, also wearing scrubs, entered the ED they noticed two “colleagues” in scrubs and often gave us a “Hi, you are one of us” look, smile, or nod, but in a split second we moved from being “one of us” to “one of us?” This facilitated the opportune moment to talk about the video handover project and ask for consent in videoing handover moments involving these clinicians. Thus, the simplicity of a full insider or a full outsider status is too great to capture the changing relationships we had with different staff.¹² For us the turbulence created by mess is part of directing a study toward a state of all’s well and a state of bonding and embedding but not there yet. Even when we get there and establish trust and a collaboratively built infrastructure on which to begin filming, it continues to be messy, because reality itself is “overwhelming, excessive, energetic, a set of undecided potentialities, and an ultimately undecidable flux” (Law 2004, 144). Our production of robustness suggests that mess may not be disorderly in an ontological and epistemological sense. As method-out-of-place it lives at the same time in relationship with some kind of ordered directionalities that can yield robust ways of doing. Thus, reawareness and reconceptualization could be considered outcomes of making & doing projects that are not limited to participant professionals. We as researcher participants reflexively learn in VRE as a form of making & doing as well. This might seem to be a clear methodological principle, but as we have detailed of our time in the ED, acting as researcher participants can be very confusing and confronting.¹³

MAKING A DIFFERENCE PRODUCES EQUALITY

While producing mess *and* robustness, making & doing may also be accompanied by vulnerability. First, the transparency of foundational activities enables clinicians to see attempts, successes, and mistakes. Yet more importantly, being on location means we are available for direct criticism, praise, and advice from participants (Carroll 2009). The collaborative character on which intervention is based transforms our project

beyond recognition. Although intervention comes with these kinds of vulnerabilities, they also provide opportunities and gains.

A successful Phase 0 is crucial in order to explain (and explain through doing) VRE's epistemology to stakeholders so that expectations can be managed and VRE can be allotted space within their research traditions or improvement traditions. We have found clinical staff to be very receptive to what they see as qualitative research and understanding that it has a different foundation. This is in part because of the preparatory work that we do in Phase 0, which involves formal meetings and informal talks, presenting to and educating people about what VRE is and what it offers. They quickly learn that you are operating in a different paradigm. In conjunction with building genuine and respectful relationships throughout Phase 0, we have experienced genuine respect for our expertise as professional researchers and have been able to convey our professional respect for participants. In our experience, we have always been taken seriously when doing interventionist research within the realist paradigm of clinical space. The intense collaboration that characterizes making & doing projects like ours provides participants an understanding that bridges differences between paradigms of understanding and reasoning. As participants are slowly turned into coresearchers, messiness becomes constructive adjustment and required flexibility for all involved. It turns out that our professional credibility not so much jeopardizes our making and doing in the open but establishes it as we go about doing our mess in a relationally driven, collaborative, transparent, humble, and therefore trustworthy way.

As we transition from filming to facilitating reflexive sessions, we are not so much outsiders or insiders but alongsiders (Carroll 2009). Our presence is of course no news for STS scholars and colleagues from other fields such as critical anthropology and feminist studies. But the implication of this situation is that participants can hold us accountable right on the spot during reflexive sessions (Carroll 2009). Presenting our findings directly to those we study instead of via a research paper or policy note is explication of our researcher's gaze (Carroll 2009). The researcher's gaze is about framing. This brings in the issue of control of the representation of the practice. In other words, producing images and representing practice is not innocent but an act of power. Participating clinicians sometimes criticize or compliment us on footage we filmed, although that is not an explicit item on the agenda. Reflexive sessions can act as "a period of contemporaneous formal accountability for both clinicians' work practices and also for the researcher's own analysis and framing of clinicians' work" (Carroll 2009, 258).

In our way of making & doing, the professional's practice is discussed and evaluated, and the researcher's work as well. The researcher can be held formally accountable—a process that arguably is more likely to happen when the researcher is present. Thus, such researcher vulnerability that we have described includes the way we make & do. Collaborative research puts us not only in the position of receiving

critical questions, critique, and compliments but also involves vulnerabilities for our research agenda: When does giving in and being flexible become a threat to one's ambitions? How to keep one's research project from being co-opted by managerial or medical agendas (Mesman 2007; Timmermans 2013)? In other words, how much involvement can VRE as one type of making & doing handle? In our experience, collaboration is not a matter of being submerged or being in full control. It is the common ground that should be the focus of attention.

CONCLUSION

The preceding describes VRE as making & doing that contributes to a reawareness, reappraisal, and reconceptualization of daily practices and can initiate new insights and change for both the professionals and the involved researchers. We also explain how making & doing projects using VRE benefit from STS by opening up practices in a counterintuitive way. In return, making & doing VRE projects offer opportunities for STS knowledge to travel and further develop. VRE, as our way of making & doing, is a passageway for STS knowledge and will continue to be in the future through training of professionals in planned obsolescence and the HELiCS¹⁴ resource (Iedema et al. 2009a). Moreover, instead of pursuing a long trajectory via policy and education, copresent researchers using VRE in making & doing projects can affect practice immediately instead of being distant figures who stand behind reports that contain lists of recommendations. To have an effect requires a robust foundation. Because such rigor emerges and is coproduced on location, mess in method is on full display as "all of us in action." The local character of making & doing VRE projects enables participants to not only see but contribute to our adjustments, successes, and failures. Through this gaze we are rendered just as vulnerable as those we study. The transparency that making & doing brings through the use of VRE has the potential to create discomfort or even suspicion about the quality of the project or our research credentials. Yet, as we discuss, messy collaboration is time intensive *and* relationship building, and it results in the robust foundation that making & doing through VRE not only acts upon but also requires. It contributes to trust as we proceed on the path that "all of us in action" have to walk. Participants intervene in our way of doing, as we do in theirs. This equalizes our vulnerability and is the interventionist principle of symmetry that making & doing VRE projects harbor. In making & doing, it is possible that everyone and everything is made and done.

While opening, pushing, and turning, we are all contaminated. This "artful contamination" (Zuiderent-Jerak and Jensen 2007, 232) has consequences beyond the walls of the practice. For example, although at first sight planned obsolescence seemed a lost cause because VRE is completely taken over by others, we—and for the very same reason—consider it the ultimate success of making a difference, because it leaves a structural mark in the ecology of health care practice. This example indicates

that we have to be cautious before defining outcomes of collaboration as risks or as success. Moreover, because planned obsolescence does not require the presence of a researcher, there is the rare possibility of a scaling up. Through VRE, making & doing can now travel to other wards in the hospital or to another hospital or even to another kind of practice, like the control room of a railroad company. As VRE becomes widespread, it amplifies our making & doing.

Making & doing through VRE opens up existing practices for both the researcher and the professionals to look at their daily work differently, assisting them in asking new questions, and looking for answers in other corners. Not only practitioners learn. Our engagement with practices also gives us the possibility to learn about and from these practices. While doing this we also learn about ourselves and how our professional biographies affect our ways of doing research (Carroll and Mesman 2011). Writing this chapter caused us to exnovate our Phase 0 practices, which are mundane and have been overlooked and taken for granted. Thus, using VRE as one mode of making & doing provides STS scholars a way into day-to-day practices to reflexively learn about others *and* themselves.

NOTES

1. Several research approaches are aimed at practice optimization while including participants actively in the knowledge production—for example, community-based participatory research, participatory research, participatory action research, and collaborative ethnography.
2. Using “professional” for everyone except the researcher has no normative connotation.
3. For more discussion on these twin goals, see Carroll and Mesman (2018) and Iedema et al. (2019).
4. For an analysis of the implications of the researcher’s position for knowledge production, see Carroll and Mesman (2018).
5. Acknowledging the STS contribution to our interventionist research, and to VRE in particular, does not deny the fact that it is hard to define exactly which and to what extent contributions are made. Therefore, we are cautious in attributing aspects solely to STS.
6. The other guiding principles are care, collaboration, and reflexivity (see Iedema et al. 2019).
7. As such, VRE comes close to the method of “situated intervention” as defined by Zuiderent-Jerak (2015, 23).
8. Iedema et al. (2019) is a clear exception to this trend.
9. One may choose clinacyst, affect as method, or planned obsolescence as VRE format.
10. This has been debunked by Law (2012) and Zuiderent-Jerak (2007), among others.
11. For an elaboration of the tension of our ethnographer identity with a rapid VRE project, see Carroll and Mesman (2011).
12. See Mesman (2007) for more on the fluidity of the insider-outsider dichotomy.
13. VRE researchers have explored the importance of the researchers’ role in shaping how VRE is used, how relationships with participants are formed, and the type of knowledge that may be generated as a result of certain researcher orientations to the doing of VRE (Carroll 2009; Carroll and Mesman 2011, 2018; Collier and Wyer 2016; Wyer et al. 2017).

14. HELiCS (Handover—Enabling Learning in Communication for Safety) is a toolkit freely available to health professionals and was developed by VRE researchers in Australia to independently teach VRE for the purposes of learning handover communication. For more information, see Iedema et al. (2009a).

REFERENCES

- Bijker, Wiebe. 2009. "Vulnerability in Technological Cultures: Address at the Occasion of the 33rd Anniversary of Maastricht University." <https://cris.maastrichtuniversity.nl/en/publications/vulnerability-in-technological-cultures-address-at-the-occasion-o>.
- Carroll, Katherine. 2009. "Outsider, Insider, Alongsider: Examining Reflexivity in Hospital-Based Video." *International Journal of Multiple Research Approaches* 3(3): 246–263.
- Carroll, Katherine, Rick Iedema, and Ross Kerridge. 2008. "Reshaping ICU Ward Round Practices." *Qualitative Health Research* 18(3): 380–390.
- Carroll, Katherine, and Jessica Mesman. 2011. "Ethnographic Context Meets Ethnographic Biography: A Challenge for the Mores of Doing Fieldwork." *International Journal of Multiple Research Approaches* 5(2): 155–168.
- Carroll, Katherine, and Jessica Mesman. 2018. "Multiple Researcher Roles in Video-Reflexive Ethnography." *Qualitative Health Research* 28(7): 1145–1156.
- Carroll, Katherine, Jessica Mesman, Heidi McLeod, Judy Boughey, Gary Keeney, and Elizabeth Habermann. 2018. "Seeing What Works: Identifying and Enhancing Successful Interprofessional Collaboration between Pathology and Surgery." *Journal of Interprofessional Care*. doi:10.1080/13561820.2018.1536041.
- Collier, Aileen, and Mary Wyer. 2016. "Researching Reflexively with Patients and Families: Two Studies Using Video-Reflexive Ethnography to Collaborate with Patients and Families in Patient Safety Research." *Qualitative Health Research* 26(7): 979–993.
- de Hoop, Evelien, Auke Pols, and Hennie Romijn. 2016. "Limits to Responsible Innovation." *Journal of Responsible Innovation* 3(2): 110–134.
- de Wilde, Rein. 2000. "Innovating Innovation: A Contribution to the Philosophy of the Future." Paper presented at the Policy Agendas for Sustainable Technology Innovation (POSTI) Conference, London, December 1–3.
- Douglas, Mary. 1966. *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. New York: Routledge.
- Downey, Gary Lee, and Teun Zuiderent-Jerak. 2017. "Making and Doing: Engagement and Reflexive Learning in STS." In *The Handbook of Science and Technology Studies*, 4th ed., edited by Ulrike Felt, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr, 223–251. Cambridge, MA: MIT Press.
- Frost, Laura, and James McHann. 2015. "Cleaning the Closet of Management Innovation: The Forgotten Stage of Exnovation." *Global Business & Economics Anthology* 2: 15–31.
- Geary, Mary. 2018. "Mud on the Carpet: Messy Reflexive Practices with Older Environmental Activists—Bringing the Outside In." In *Messy Ethnographies in Action*, edited by Alexandra Plows, 3–13. Malaga, Spain: Vernon Press.
- Grol, Richard, Michael Wensing, Martin Eccles, and David Davis, eds. 2013. *Improving Patient Care: The Implementation of Change in Health Care*. Chichester, UK: Wiley-Blackwell.

Hermwille, Lukas. 2017. *En Route to a Just Global Energy Transformation? The Formative Power of the SDGs and the Paris Agreement*. Berlin: Friedrich-Ebert-Stiftung.

Heyen, Dirk Arne. 2017. "Governance of Exnovation: Phasing Out Non-sustainable Structures." Oeko-Institute Working Paper 2/2017. Freiburg, Germany.

Iedema, Rick, and Katherine Carroll. 2011. "The 'Clinalyst': Institutionalizing Reflexive Space to Realize Safety and Flexible Systematization in Health Care." *Journal of Organizational Change Management* 24: 175–190.

Iedema, Rick, and Katherine Carroll. 2013. "Intervening in Health Care Communication Using Discourse Analysis." In *Discourse(s) and Context(s)*, edited by John Flowerdew, 185–204. London: Continuum.

Iedema, Rick, Katherine Carroll, Aileen Collier, Su-yin Hor, Jessica Mesman, and Mary Wyr. 2019. *A Video-Reflexive Ethnography in Health Research and Healthcare Improvement: Theory and Application*. Boca Raton, FL: CRC Press.

Iedema, Rick, Eamon Merrick, Ross Kerridge, Robert Herkes, Bonne Lee, Mike Anscombe, Dorrilyn Rajbhandari, et al. 2009a. "Handover—Enabling Learning in Communication for Safety (HELiCS): A Report on Achievements at Two Hospital Sites." *Medical Journal of Australia* 190(11): S133–S136.

Iedema, Rick, Eamon Merrick, Dorrilyn Rajbhandari, Alan Gardo, Anne Stirling, and Robert Herkes. 2009b. "Viewing the Taken-for-Granted from Under a Different Aspect: A Video-Based Method in Pursuit of Patient Safety." *International Journal of Multiple Research Approaches* 3(3): 290–301.

Iedema, Rick, Jessica Mesman, and Katherine Carroll. 2013. *Visualising Health Care Practice Improvement: Innovation from Within*. London: CRC Press.

Law, John. 1994. *Organizing Modernity*. Oxford: Blackwell.

Law, John. 2004. *After Method: Mess in Social Science Research*. New York: Routledge.

Law, J. 2007. "Making a Mess with Methods." In *The Sage Handbook of Social Science Methodology*, edited by William Outhwaite and Stephen P. Turner, 595–606. London: Sage.

Law, John. 2012. "Collateral Realities." In *Politics of Knowledge*, edited by Patrick Baert and Fernando Domínguez Rubio, 156–178. London: Routledge.

Mesman, Jessica. 2007. "Disturbing Observations as a Basis for Collaborative Research." *Science as Culture* 16(3): 281–295.

Mesman, Jessica. 2008. *Uncertainty in Medical Innovation: Experienced Pioneers in Neonatal Care*. Hampshire, UK: Palgrave Macmillan.

Mesman, Jessica. 2011. "Resources of Strength: An Exnovation of Hidden Competences to Preserve Patient Safety." In *A Socio-cultural Perspective on Patient Safety*, edited by Emma Rowley and Justin Waring, 71–94. Aldershot, UK: Ashgate.

Mesman, Jessica. 2015. "Boundary-Spanning Engagements on a Neonatal Ward: A Collaborative Entanglement between Clinicians and Researchers." In *Collaboration across Health Research and Care*, edited by Bart Penders, Niki Vermeulen, and John Parker, 171–194. Aldershot, UK: Ashgate.

Morris, Zoë Slote, Steven Wooding, and Jonathan Grant. 2011. "The Answer Is 17 Years, What Is the Question: Understanding Time Lags in Translational Research." *Journal of the Royal Society of Medicine* 104(12): 510–520.

Pink, Sarah. 2013. *Doing Visual Ethnography*. London: Sage.

- Plows, Alexandra. 2018. "Introduction: Coming Clean about Messy Ethnographies." In *Messy Ethnographies in Action*, edited by Alexandra Plows, xiii–xxv. Malaga, Spain: Vernon Press.
- Rodriguez, Hector, Rachel Mosher Henke, Salma Bibi, Patricia Ramsay, and Stephen Shortell. 2016. "The Exnovation of Chronic Care Management Processes by Physician Organizations." *The Milbank Quarterly* 94(3): 626–653.
- Ruby, Jay. 2005. "The Last 25 Years of Visual Anthropology: A Critical Review." *Visual Studies* 20: 159–170.
- Sormani, Philippe, Morana Alac, Alain Bovet, and Christian Greiffenhagen. 2017. "Ethnomethodology, Video Analysis, and STS." In *The Handbook of Science and Technology Studies*, 4th ed., edited by Ulrike Felt, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr, 113–138. Cambridge MA: MIT Press.
- Timmermans, Stephan. 2013. "Seven Warrants for Qualitative Health Sociology." *Social Science & Medicine* 77: 1–8.
- Wyer, Mary, Rick Iedema, Su-yin Hor, Christine Jorm, Clair Hooker, and Lyn Gilbert. 2017. "Patient Involvement Can Affect Clinicians' Perspectives and Practices of Infection Prevention and Control: A "Post Qualitative" Study Using Video-Reflexive Ethnography." *International Journal of Qualitative Methods* 16: 1–10.
- Zuiderent-Jerak, Teun. 2007. "Preventing Implementation: Exploring Interventions with Standardization in Healthcare." *Science as Culture* 16(3): 311–329.
- Zuiderent-Jerak, Teun. 2015. *Situated Intervention: Sociological Experiments in Healthcare*. Cambridge, MA: MIT Press.
- Zuiderent-Jerak, Teun, and Casper Bruun Jensen. 2007. "Editorial Introduction: Unpacking 'Intervention' in Science and Technology Studies." *Science as Culture* 16(3): 227–235.

© 2021 Massachusetts Institute of Technology

This work is subject to a Creative Commons CC-BY-NC-ND license.



Subject to such license, all rights are reserved.

The open access edition of this book was made possible by generous funding from Arcadia—a charitable fund of Lisbet Rausing and Peter Baldwin.



The MIT Press would like to thank the anonymous peer reviewers who provided comments on drafts of this book. The generous work of academic experts is essential for establishing the authority and quality of our publications. We acknowledge with gratitude the contributions of these otherwise uncredited readers.

This book was set in Stone by Westchester Publishing Services, Danbury, CT.

Library of Congress Cataloging-in-Publication Data

Names: Downey, Gary Lee, editor. | Zuiderent-Jerak, Teun, editor.

Title: Making & doing : activating STS through knowledge expression and travel / edited by Gary Downey and Teun Zuiderent-Jerak.

Description: Cambridge, Massachusetts : The MIT Press, 2021. | Includes bibliographical references and index.

Identifiers: LCCN 2020044365 | ISBN 9780262539975 (paperback)

Subjects: LCSH: Communication in science. | Communication of technical information. | Science--Study and teaching--Research. | Technology--Study and teaching--Research.

Classification: LCC Q223 .M35 2021 | DDC 507.1--dc23

LC record available at <https://lccn.loc.gov/2020044365>