A transactional approach to patient safety

Citation for published version (APA):

Zinck Pedersen, K., & Mesman, J. (2021). A transactional approach to patient safety: Understanding safe care as a collaborative accomplishment. *Journal of Interprofessional Care*, 35(4), 503-513. <https://doi.org/10.1080/13561820.2021.1874317>

Document status and date:

Published: 04/07/2021

DOI:

[10.1080/13561820.2021.1874317](https://doi.org/10.1080/13561820.2021.1874317)

Document Version:

Publisher's PDF, also known as Version of record

Document license:

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To cite this article: Kirstine Z. Pedersen & Jessica Mesman (2021): A transactional approach to patient safety: understanding safe care as a collaborative accomplishment, Journal of Interprofessional Care, DOI: [10.1080/13561820.2021.1874317](https://doi.org/10.1080/13561820.2021.1874317)

To link to this article: <https://doi.org/10.1080/13561820.2021.1874317>

Published online: 02 Mar 2021.

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ARTICLE

A transactional approach to patient safety: understanding safe care as a collaborative accomplishment

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ABSTRACT

Within the last two decades, it has been commonly agreed that patient safety and error management in healthcare organizations can best be attained by adopting a systems approach via re-engineering efforts and the introduction of industrial safety technologies and methodologies. This strategy has not delivered the expected result. Based on John Dewey's pragmatism, we propose another vocabulary for understanding, inquiring into and learning from safety situations in healthcare. Drawing especially on Dewey's understanding of transaction as the inseparability between human and environment, we develop an analytical approach to patient safety understood as a transactional accomplishment thoroughly dependent on the quality of situated and shared habits and collaborative practices in healthcare. We further illustrate methodologically how a transactional attitude can be situationally practised through video-reflexive ethnography, a method that allows for inquiry into mundane safety practices by letting inter-professional teams see, reflect upon and possibly modify their shared practices and safety habits.

ARTICLE HISTORY

Received 19 December 2019
Revised 27 October 2020
Accepted 19 December 2020

KEYWORDS

Transaction; patient safety;
systems approach; video-
reflexive ethnography;
collaborative practices;
pragmatism

Introduction

Lack of safety in healthcare was traditionally considered the result of sub-standard care, often with a focus on the performance of individual clinicians (e.g., Bosk, 1979/2003; Rosenthal, 1995), but in the late 1990s the locus of errors shifted to the wider context in which clinical teams provide care (Kohn et al., 1999; Leape, 1997). Thus, within the last two decades it has generally been agreed that patient safety requires what James Reason (2000) famously announced as a shift from a 'person' to a 'systems approach': to identify, understand and eliminate errors, one needs to understand and optimize the wider system of care. The systems approach as promoted in influential policy reports (Department of Health, 2000; Kohn et al., 1999; World Health Organization, 2009) is based on disciplines such as safety science, systems engineering and human factors research that collectively suggest that in order to improve patient safety we must shift from focusing on the performance of the healthcare professional to optimizing healthcare systems. Thus, safety science experts, human factors researchers and systems engineers have become accepted as experts in a field otherwise under the jurisdiction of healthcare professionals (Bosk & Pedersen, 2019; Waring et al., 2016). Since its initiation, the systems approach to patient safety has prioritized large-scale reorganizations, centralized management solutions and the importing of safety technologies and methodologies from other industries, such as aviation and manufacturing (including incident-reporting systems, checklists and error-analysis tools). The goal is optimized healthcare systems where safety design makes it increasingly difficult – or indeed impossible – for healthcare professionals to make mistakes.

The systems approach to patient safety and its plethora of improvement initiatives has changed how patient safety is conceptualized and attended to in healthcare organizations. Improvement initiatives have largely been geared toward standardization and 'rule-based solutions' (Béguin et al., 2009; McDonald et al., 2006; Vincent & Amalberti, 2016) such as checklists, guidelines, targeted safety systems, failsafe procedures and incident-reporting and analysis systems. Local gains have been reported, especially when efforts are focused on particular risk areas such as infections or medication error (National Patient Safety Foundation, 2015; Vincent & Amalberti, 2016). However, after almost two decades of systems thinking in healthcare, it has proved difficult to demonstrate increased safety as a general outcome of the massive-coordinated efforts (e.g. Landrigan et al., 2010; Langelan et al., 2017). This slow and spotty improvement is increasingly acknowledged by academics, practitioners and policymakers alike (Baker & Black, 2015; Bates & Singh, 2018; Hollnagel et al., 2013; National Patient Safety Foundation, 2015; Pronovost et al., 2015; Wears et al., 2015; Wears & Sutcliffe, 2019).

In response to the growing critique of current patient safety efforts and their lack of further progress, some argue that the problem is not the systems approach as such but either its inadequate implementation or a somehow flawed understanding of 'the system' in question (Dekker & Leveson, 2015; Lawton, 2018). Thus, it has been suggested, for instance, that our understanding of the system should be broadened to include the entire patient journey and the involvement of patients and their families (Institute for Healthcare Improvement, 2017; Vincent et al., 2017) and to take more seriously the role of organizational culture

and safety climate (Grant et al., 2014; Waterson, 2014). Moreover, there is a shift from focusing on incidents and standardization to foregrounding resilience and adaptation as system properties necessary to secure safety in healthcare (Braithwaite et al., 2015; Dekker, 2011; Hollnagel et al., 2013; Wears et al., 2015). This new 'Safety-II' approach contends that rather than understanding safety as reliability through preventing errors in relatively stable systems, safety must be understood as resilience or robustness; that is, as the ability of a complex system to adapt to constantly changing environments (Dekker, 2011; Hollnagel, 2014). This approach also comes with an interest in understanding how safety is positively attained rather than exclusively focusing on what goes wrong (Mesman, 2011; Wears et al., 2015). Thus, with Safety II thinking we have seen a welcomed appreciation of the performance variability of healthcare practices and of a more proactive view on safety.

By drawing the contours of a pragmatic approach to patient safety as a shared, often team-based accomplishment, we suggest however – together with other social-cultural perspectives on patient safety (see Rowley & Waring, 2011; Waring, 2015) – that there might be complementary and alternative routes toward understanding patient safety and approaching the current crisis of patient safety management (e.g., Braithwaite et al., 2005; Oxman et al., 2005). Because, notwithstanding the described developments in safety science, some of the conceptual and methodological foundations of the systems approach can be debated. Core concepts like 'system', 'culture' and 'context' have been described as impoverished, as neglecting the social, political and cultural complexity of healthcare organization (Waring et al., 2016, p. 204). This complexity is in part due to the fact that patient safety knowledge is equally 'slippery' and 'sticky' (Waring, 2015, pp. 43–44). It is slippery, because it is often neither objective, tangible nor classifiable. Rather, its meaning is constructed in particular settings as a consequence of certain ways of asking or types of attention. Furthermore, it is sticky because it is always connected to the situated norms, values and practices of healthcare professionals. Thus, 'it is deeply embedded within, not easily de-coupled from, closely connected groups of social actors' (p. 44). These characteristics make patient safety knowledge difficult to model as part of a systems approach, in which safety is expected to exhibit more neutral, scientific, and measurable characteristics. In alignment with this critique, the systems approach has been criticized for its privileging of a system-based understanding of reality (Caldwell, 2012). In promoting blame as 'the enemy of safety' (Dekker & Leveson, 2015), it is common for both old and new versions of the systems approach to separate human conduct and social agency from 'the system' to promote safety as a feature of system-design. Insofar as human conduct and agency are part of a systems-approach modelling of the healthcare system, it is often in the capacity as system-components (Dekker & Leveson, 2015) able to, for instance, trigger warnings or sense weak signals (Sheps & Cardiff, 2011). This technical, systemic understanding of the role of healthcare professionals in safety falls short of comprehending safety as an integrated, indeed inseparable, part of the habituated and socialized practices, norms and values of healthcare professionals (Bosk, 1979/2003; Bosk & Pedersen, 2019; Pedersen, 2018; Waring, 2015).

Having these dominant traits of systems thinking in mind, it might not come as a surprise that although Safety II has much to offer, newer systems-based solutions are not so different from earlier ones (Pedersen, 2016). Thus, while current reports argue for an optimized 'whole systems approach' and a more 'holistic' view on systems change, they still emphasize the need for, for instance, more importing of technologies from high-reliability industries, more measuring in terms of uniform safety metrics, more centralized oversight and a greater focus on leadership capabilities (Baker & Black, 2015; National Patient Safety Foundation, 2015; Pronovost et al., 2015).

In this paper, we suggest that the systems approach to patient safety must not stand-alone. Because given the characteristics of this approach – its 'techno-scientific approach' (Waring, 2015, p. 46) to safety knowledge, its privileging of a systems-based understanding of reality and its preference for centralized redesign efforts – it risks undermining situated healthcare practices as the locus of safe care. Thus, it risks neglecting not only the role of agency (Furniss et al., 2019, p. 699) but also the importance of norms, habits, training, and situated learning and, in particular, interprofessional teamwork and collaborative practices for safety (Bosk & Pedersen, 2019; Caldwell, 2012; Elkjaer, 2001; Pedersen, 2018; Waring, 2015).

We therefore present an approach to patient safety based on John Dewey's understanding of action as transaction – that is, as done by humans and their environment in inseparable intertwinement – as well as his concepts of situation, habit and inquiry. Here, safety must be understood as a situation-based, embedded and transactional day-to-day accomplishment. Our pragmatic approach to patient safety adds to a rising interest in anti-dualist thinking in current safety research (Le Coze, 2013; Furniss et al., 2019) and in pragmatism as a way to enhance our knowledge about and/or practical tools for improving healthcare settings and interprofessional education (see, e.g., Hutchings et al., 2013; Iedema et al., 2020, 2013; Pedersen, 2016, 2018). Using our pragmatic approach, we understand safe care as a collaborative accomplishment or action that does not 'belong' to 'the human' or to 'the system' but is instead a relational practice in which humans and their environments are inseparably linked. When patient safety is understood as action, as something that is *done* or *accomplished* (Jerak-Zuiderent, 2012; Mesman, 2012; Rowland & Kitto, 2014), it becomes paramount to take one's point of departure where the action is: in actual clinical situations. Approaching patient safety as an emerging phenomenon embedded in collaborative action as practice, we also avoid the tendency to try to locate safe patient care in neatly separated and well-demarcated entities or improvement measures (humans, systems, standardization, resilience, errors, strengths etc.).

Yet, a transactional position also requires methodologies that take their point of departure in safety understood as a situated and collaborative accomplishment. In the second half of this paper, we present video-reflexive ethnography (VRE) (Iedema & Carroll, 2011; Iedema et al., 2019, 2013) to discuss what a transactional approach to patient safety might look like in practice. Using the VRE methodology implies recording *in situ* work practices and then replaying selected footage for discussion with participants in video-reflexive

sessions. By analyzing an example of a video-reflexive meeting at a neonatology ward in a Dutch hospital, we propose that VRE as a situational method aligns with the transactional perspective on patient safety. We argue that video footage of clinical situations can create possibilities for shared interprofessional inquiry – and thus for the development of new types of team-based safety dispositions – based on the foregrounding of the otherwise often invisible transactions in the everyday work in healthcare.

John Dewey's transactional stance

Dewey spent most of his life arguing against dichotomizing tendencies, or what he described as either-or philosophy, and our tendencies to think of dualisms, such as means and ends, human and environment, theory and practice, mind and body, habit and reflexivity, as *a priori* dichotomies rather than empirical challenges of investigation (e.g., Dewey, 1922, 1938; Dewey & Bentley, 1949). In our search for a new vocabulary for thinking about patient safety that overcomes the dichotomizing tendencies of many of the available approaches and their safety measures, we therefore turn to John Dewey (1922, 1949) as the backbone of our argument. In particular, we turn to his concurrent quest to overcome what he understood to be a fake dichotomy between human and environment in social-physiological, philosophical and humanistic thinking. To Dewey (2008), everything is relational; he argued that ‘association in the sense of connection and combination is the “law” of everything that exists’ (p. 250). This law of connection also applies to humans, who are essentially social beings. Dewey (1984) underscored that humans who are ‘not bound together in associations, whether domestic, economic, religious, political, artistic or educational, are monstrosities’ (pp. 80–81). Some of Dewey’s most important theoretical constructs underscore this interconnection and remind us not to assume *a priori* the presence of certain distinctions in the empirical world. In the following, we turn to four of these – ‘situation’, ‘transaction’, ‘habit’ and ‘inquiry’ – to investigate how pragmatism’s non-dichotomizing language and methodology can help us understand and improve interprofessional practices of care by taking our point of departure in the inseparable intertwinement of humans and systems.

In order to sidestep any tendency to dichotomize, Dewey suggested always taking one’s point of departure in actual practical ‘situations’. Situations are something we co-create, rather than something we enter into or that exists outside our inquiries, actions and engagements with the world (Dewey, 1922; Dewey & Bentley, 1949). By making the methodological move of taking our point of departure in situations, we are forced to reconsider conventional distinctions and to recognize the reciprocity and mutual dependency between the organism and its environment or surroundings (Dewey, 1922; Dewey & Bentley, 1949). In healthcare practices, this means drawing attention to the inseparability of healthcare professionals, the team, the clinical and technological context, and the wider organization of care. From this perspective, then, safety must be understood as a situated, temporal and co-constructed accomplishment that cannot be ascribed to any individual entity.

This leads us to Dewey’s concept of ‘transaction’, which he developed with Arthur Bentley (Dewey & Bentley, 1949), especially to underscore the inseparability of human and environment that marks a situation. By using the word ‘transaction’ rather than, for instance, ‘interaction’,¹ Dewey and Bentley (1949) overcame the idea of human and environment as separate entities and developed a stance by which it becomes possible to analyze action as ‘processes of the full situation of organism-environment’ (p. 131). With this transactional view, actions cannot be attributed to “elements” or other presumptively detachable or independent “entities,” “essences,” or “realities” (p. 133). Hereby they developed a method of inquiry that discards what they viewed as the ‘perspective of self-action where things are viewed as acting under their own powers’ (p. 132). In mainstream patient safety, this perspective of self-action is represented when error – or indeed safety – is ascribed to either humans or systems or to any other presumably detached entity: that is, when safety is located in, for instance, safety culture and the attitudes of healthcare professionals, or in systemic components, technologies and wider organizational and logistical processes. Dewey and Bentley (1949), however, did not only argue against the idea of self-action. Going a step further, they argued that the transactional stance is also different from an interactional stance ‘where thing is balanced against thing in causal interconnection’ (p. 132). Thus, entities such as ‘humans’ and ‘environments’ should be approached not as preexisting, separate things, needing to *inter*-act or be balanced against each other, but as inseparable empirical phenomena.² This means that from a transactional perspective, it is not enough to state that patient safety is achieved through the optimally balanced combination of safety culture, systemic measures, human factors, technologies and so forth, as each of these cannot be meaningfully separated as autonomous entities in causal interrelation in the collaborative doing of patient safety in actual clinical situations.

Apart from ‘situation’ and ‘transaction’, a third concept is vital in understanding Dewey’s quest to overcome the human/environment dichotomy: the concept of ‘habit’.³ To Dewey (1922), habits are patterns of action and thought that are somehow ‘stored’ from earlier experience (p. 42). By understanding habits as acquired or learned predispositions to act, or as a readiness to respond in particular ways to problems or context-specific situations, Dewey considerably broadened the concept of habit beyond its normal usage. The common understanding of habits as mindless or repetitive action was to Dewey (1922) part of habits, but he maintained that ‘repetition is in no way the essence of habit’ (p. 17). Rather, habits should be understood as active and adaptable. With a pragmatic attitude we must, as proposed by Nelsen (2015), always ask ‘how we can create contexts in which we nurture them [habits] to remain plastic and adaptable to new situations while retaining their usefulness’ (p. 89). Moreover, although habits are physical, like walking and standing straight, they are equally mental; they guide our thoughts and enable us to think and inquire into the problems we encounter.

According to Dewey (1922), one of the most important traits of habits is that they require ‘the cooperation of organism and environment’ (p. 14) – and thus are transactional. In the

same way that our physical functions such as breathing and seeing depend on light and air, habits are ‘functions of the surroundings as truly as of a person’ (Dewey, 1922, p. 14). Dewey (1922) argued that habits are ‘done’ by the environment just as much as by humans, and that we should therefore laugh ‘at any one who said that he was master of stone working, but that the arts was cooped up within himself and in no wise dependent upon support from objects and assistance from tools’ (p. 15). In this way, habits are shared and collaborative in Dewey’s understanding. Taking a Deweyan approach to patient safety, accomplishing safety and preventing error require accounting for the importance of habits for healthcare professionals as well as for well-functioning teams and collaborations.

The fourth Deweyan concept of relevance is ‘inquiry’. In *The Logic of Inquiry*, Dewey (1938) defined inquiry as directed attempts at solving problems, reducing doubts or determining certain traits of ‘problematic’ or ‘indeterminate’ situations. In other words, inquiry refers to reflexive attempts to analyze, solve and learn from situations in which we cannot act habitually but must actively and reflectively engage and problem-solve to temporarily ‘settle’ the situation – that is, in order to understand the situation in a way that allows for further action. Inquiring is equally transactional and social. Dewey (1938) explained how we must understand inquiry both as always socially conditioned and as having social consequences. Inquiry, then, is a transaction not only of human and physical environments but also of social and cultural environments (Dewey, 1938, pp. 28–29).

Importantly, Dewey’s notions of inquiry and habit are closely related. Not only is thinking and inquiring habitual; it is something we need to train and learn just as any other skill. Inquiry as a reflexive process is stored as an experience and thus is a way for the human and the group/team to exert reflexive control over their own habit formation (see also Hickman, 2007). Therefore, good or intelligent habits – habits that are not merely mechanical repetitions – are often based on earlier inquiry. Thus, a main effect of inquiry into problematic situations – into unsettled situations that somehow require reflection and problem-solving – is the development of new habits and the refinement and adaptation of old ones, which then proposed new possible ways to act and problem-solve in the future.

From a pragmatic perspective, then, any attempt to analyze action or to initiate change must take as a starting point situations in which actions and practices are understood as shared transactional accomplishments. Safety here is understood not as a property of systems but as an activity that depends on a complex process of collaboration of safety systems, organizational routines, experience-based habits, thoroughly rehearsed interprofessional teamwork, medical technology, clinical guidelines and professional discretion. In this complex operation, safety as a practice (failed or successful) cannot be attributed to any single ‘actor’ (human or system) or even to any one right combination of ‘actors’ – it is thoroughly a collaborative accomplishment.

Practising a Deweyan approach to patient safety requires a situational approach to healthcare practices where shared habits and collaborative practices are the foci. We consider

VRE to be a strong candidate for one method that allows a non-binary approach in which collaborative healthcare practices are understood as transactions. In the following, we present the VRE method and suggest how it aligns with a transactional approach to patient safety. Specifically, we discuss the use of VRE in practice by presenting a video-reflexive meeting that occurred in a neonatology ward in a hospital in the Netherlands. Using this example, we illustrate how video footage of clinical situations can create possibilities for shared interprofessional inquiry – and therefore for the development of new types of team-based safety dispositions – based on the foregrounding of the otherwise often invisible transactions in everyday healthcare work.

Video-reflexive ethnography

VRE is a visual method used by researchers and/or practitioners to understand and improve work practices (e.g., Collier & Wyer, 2016; Hor et al., 2014; Iedema & Carroll, 2011; Wyer et al., 2017). VRE has three distinct phases (Carroll & Mesman, 2018). The first focuses on collecting ethnographic data via observations, field interviews and the videoing of day-to-day work practices. The practitioners are closely involved in decisions concerning the what (e.g., specific procedures, their handovers, doctors ward rounds, etc.), when and where of the video shots. A selection of this footage is converted into short video clips. In the second phase, these video clips are replayed for the participating professionals in video-reflexive sessions. During both phases, ethical considerations are paramount. These include decisions about consent and anonymization, such as not showing faces or identifiable content for either patients or staff (Clark, 2012; O’Reilly et al., 2011). The reflexive sessions are key to opening up existing practices. Because they focus on what works well, reflexive meetings can contribute to a re-awareness and re-appreciation of the ingenuity and effectiveness of professionals’ ‘mundane’ practices and competences. Moreover, reflexive sessions can be vital in the adaptation, interpretation and translation of formal evidence or procedures to the complexity and unpredictability of local circumstances and situated practices (Iedema & Carroll, 2011). In achieving such levels of articulation, engagement and analysis, the role of the facilitator – either a practitioner or a researcher – is key because it is not always easy to analyze situations in which nothing ‘remarkable’ happens. In a dynamic and often unpredictable way, reflexive meetings can enable participants to develop skills of being able to see and talk about practices and situations in ways that apply not only to the ‘here and now’ but also to future practices (Iedema et al., 2009). It is the ‘hologrammatic’ character of video that enables participants to ‘see’ the past (what happened just before the footage was shot), to ‘see’ in the future (they can imagine beyond the endpoint of the footage) and to ‘see’ the environment in which the situation occurred (their own practice) (Iedema et al., 2019, 2013). Thus, these reflexive sessions can bring about a new understanding of the ‘taken-for-granted’, which acts as input for practice change as well as academic arguments. For this reason, reflexive meetings are recorded and serve as additional data sets. Practice optimization and academic output are the third phase of the VRE. In

this final phase, the collaborative character of VRE can be practised through possible co-authorship of participants in research output (e.g., Carroll et al., 2018; Snijelaar et al., 2020).

To illustrate VRE as a transactional method of inquiry and to help interprofessional teams practise a transactional approach, we present a discussion held during a video-reflexive session. Our example of VRE in practice occurs in a Dutch hospital and shows a video-reflexive meeting in which staff discuss the use of sterile gloves in their unit. The empirical data on which our example is based were collected during a quality improvement project in which one of the authors acted as facilitator for implementing the VRE method on this ward.

As facilitator, she attended the reflexive meetings as observer and did not participate in the discussion presented below. Over time, the VRE method and its reflexive meetings have become a structural part of the improvement activities on several wards in this hospital.

The quality improvement project conforms to common ethical standards and procedures for informed consent in healthcare practice and qualitative research. In close collaboration with the project team, the hospital's legal department organized a process of obtaining informed consent from participating staff and parents of patients captured on film.⁴ This process involved informing the participants about methods and aims of the project as well as their possibility to withdraw from the project at any time. In addition, staff were informed that their participation and the gathered data would not play a role in their yearly appraisal. On this basis, participants voluntarily agreed to take part in the project including being filmed, and gave their consent to the use of anonymized data including pictures and videos for teaching purposes as well as dissemination and publication of research. Anonymization of virtual images raises specific ethical challenges (Wiles et al., 2012). In this project, research participants agreed that not filming faces (or afterward removing faces by for instance pixilation) would count as sufficient anonymization.

Putting on sterile gloves: a reflexive meeting in a neonatal intensive care unit⁵

Our example is situated in a Dutch hospital's neonatal intensive care unit (NICU), where the most severely ill premature babies receive treatment. For some time, the unit's clinical team has been using VRE to experience by sight, reflect upon, learn about and possibly improve their shared safety practices. On the neonatology ward, an interprofessional video team of four nurses and a neonatologist takes care of filming, selecting clips, organizing the video-reflexive sessions, facilitating the discussion and addressing suggestions for further improvement made during the discussions.

Given the vulnerability of the NICU patient population, a strictly controlled environment is required. Hygiene rules must be strictly adhered to because infections contribute substantially to patient morbidity and mortality rates. Therefore, many instances of safe care require wearing of sterile gloves. This situation makes putting on sterile gloves a daily safety routine and thus was considered by the video team to be an

excellent topic for VRE sessions. As part of the preparation, the team filmed many situations in which colleagues need to wear sterile gloves. While filming, they zoomed in on their colleagues' hands to capture the action. A selection of this footage was replayed during one of the ward's video-reflexivity meetings. The meeting was facilitated by members of the video team, who led the discussion (the moderator) and managed the video clips on the computer. Although any member of the video team can act as moderator, the role should not be underestimated. The role of the moderator is crucial in video-reflexive sessions to provide a safe zone for everyone to speak up and express insights about the way things are done (Mesman et al., 2019).

NICU 15.00:

The moderator, an experienced senior nurse, opens the meeting and advises participants to take a moment to reflect before responding. The first video clip shows a nurse next to an incubator putting on her gloves while there is hardly any space on the workstation to open up the packages. The second clip shows a doctor sitting behind a neatly cleaned trolley table in the corner of the NICU. Except for the package containing the sterile gloves, there is nothing else on the little table (see [pictures 1 and 2](#) for the two workstations).

The next videoclip shows a neonatologist standing behind a sterile field in the middle of the ward, readying himself for gowning and gloving in order to perform a sterile procedure. A nurse is helping him put on the long-sleeved, sterile gown and the gloves. Before continuing with the other video clips, the moderator asks, 'Is there anything in particular you notice besides thinking "yes, that is the way we do things here"?' After a moment of silence, a doctor

Figure 1. Gloving in busy environment.

Figure 2. Gloving on clean trolley table.

replies: 'I am just wondering about the first clip ... I missed something'. 'Yes, me too', a nurse responds, 'we do not know if she (the nurse in the first clip) had already turned on the heating system before putting on the gloves?' 'Yes, good question', the doctor agrees, 'but I also wonder if she washed her hands before putting on the gloves. What we see is that she opens up the package with her bare hands.'

Their discussion about the way to open the package containing the sterile gloves continues. Someone points out that the items piled up next to the incubator make it almost impossible to open the package another way. From here, other participants enter the discussion about the increasing amount of infusion lines, equipment and care items invading their workspace. The video clips on display clearly trigger frustration, and the nurses in particular complain about how difficult it is to maintain sterility while opening a package in such circumstances. Moreover, the participants become aware that although a protocol describes how to put on sterile gloves, it does not mention *where* to do so. When the moderator asks what the best place is, all refer to the second clip, showing the doctor behind the little trolley table. However, there are only two of these in the NICU. Often they are already taken by another colleague when needed. A participant suggests ordering three more tables. But that is viewed as adding another problem: 'Where to put them when we do not use them? It is already rather stuffed here.' Searching for a clean and quiet spot to put on gloves close to an incubator turns out to be a complex matter on this ward. The neonatology staff continue discussing the pros and cons of having additional trolley tables on the ward solely for gloving. There is no clear agreement. Therefore, they decide to check out other intensive care units and to learn from their practices.

Yet, this is not the end of their observations. While watching the video, they also become aware of the differences in the packaging of the gloves. To everyone's surprise, gloves of different sizes turn out to be of two different brands. No one has noticed this before because each person uses the same size each day and pays no attention to the other sizes. While watching the video clips, the staff now become aware that the way that one of the brands' glove package is folded makes it considerably easier to open up than the other. While wondering when this diversity of brands has entered their ward, they decide that from now on all will use the brand that is easy to open and therefore the best for maintaining sterility.

Apart from the issue of brands, there is a fundamental disagreement about how to open a package so that it secures the sterility of the gloves. Although described in detail in one of their protocols, there is no agreement among the participants, and this topic dominates their discussion for the rest of the session. This discussion is based on a mixture of arguments, body language and references to the footage. While arguing and mimicking the procedure of opening the package with their hands and arms, they also refer to their situated reality by pointing to the screen (see [picture 3](#)).

Figure 3. Discussing gloving routines at video reflexive meeting.

It may be surprising that footage of doctors and nurses putting on sterile gloves led to a discussion not about the *actual* act of gloving but rather about the procedure of opening the package containing the gloves. The video played a crucial role in the selection of this topic. It is unlikely that questions about where and how to open a package of sterile gloves would be addressed in the same way had the meeting been pre-established as a talk about the gloving protocol. In this case, the point of departure for discussing the gloving procedure would likely be when the package is already open. The repositioning of attention to the *wider context* in which the action takes place is the effect of the hologrammatic character of video as explained above. Similarly, the hologrammatic effect of the video allows for discussions about events *before* the actual moment the footage began (washing hands and switching on the light above the incubator). Thus, the video footage brings into the context both time and place and points to safety as a complex and continuous accomplishment and as a transaction between human and environment.

This VRE session on gloves led to concrete changes of environment by ending the use of a particular brand of gloves and ordering three more trolley tables. Moreover, it led to a re-awareness of the gloving procedure, a new attention to the importance of the packing of the gloves for sterility, and a more general awareness of gloving as a continual accomplishment based on the intertwinement between person, team and environment. This is exemplified, for instance, by the focus on how sterile gloving also involves the switching on of the light, the washing of hands, the collaborative element of putting on gloves, the availability of suitable and clean places to put them on, and so forth. Team members further reported that in general the use of VRE on their unit helped them 'confront' each other when ways of doing require attention or correction because they can refer to the reflexivity sessions. In this way, VRE as an inquiry method has more general, long-term effects on shared interprofessional learning and habituation in the ward.

VRE as a transactional approach

Video footage of ordinary daily activities foregrounds what is normally taken for granted: the habituated practices, routinized skills, trained reactions and complex interprofessional collaborations that make up clinical situations. With a transactional stance, this foregrounding can be understood as a collaborative inquiry: the reflexive meetings are intended to inquire into specific, everyday clinical situations with the purpose of articulating and 'problematizing' what is normally taken for granted in the group and by its members. In line with Dewey's understanding of the inquiry, the task of problematizing, analyzing and momentarily settling different types of safety situations – otherwise routine and taken-for-granted – can increase a shared awareness of the problems of the situation and, at times, rethinking or improvement of routines, technologies and practices.

Thus, VRE facilitates a process in which the available resources critical to safety are scrutinized through a collaborative inquiry that allows the interprofessional team to see, reflect upon and potentially modify safety practices. In line with a Deweyan stance, Iedema et al. (2013, p. 10; see also

Iedema & Carroll, 2011) refer to this as a learning process – not about interventions and inventions by experts or systems engineers elsewhere but based on locally shared and constantly evolving practical wisdom. This is also what the concept of *exnovation* seems to capture: the setting makes possible not innovation but ex-novation, exposing what is already there in order to improve practices (Mesman, 2011).

The point of departure for this collective inquiring is the *situation* as presented in the video clips. Dewey (1923) suggested that knowledge about habits cannot ‘be conveyed by the written or spoken word, so that it means to the recipient what it means to the person who is trying to convey it’ (p. ix). He further stated that ‘the hardest thing to attend to is that which is closest to ourselves, that which is most constant and familiar. And this closest “something” is, precisely, ourselves, our own habits and ways of doing things’ (pp. xxvii-xxviii). If we think, he argued, that we can change habits just by word, thought or will, we will fail.⁶

Using video as a method thus plays an important role in capturing the situation and the habituated work practices at play in interprofessional teamwork. VRE sessions have been said to make it possible to view habits and learn from them through a ‘situated distance’ (Carroll & Mesman, 2018), a combination of being close and creating distance. Video distances us from ourselves, our daily context and our shared interactions via another perspective, but it also brings the work closer as we see things we did not see while enacting the work. This combination enables us to identify our repertoires of doing things, or what Dewey referred to as our habits or dispositions (which are not necessarily conveyable in words), while being open to modification or improvement. This ‘situated distance’ allows interprofessional teams in VRE sessions to reflect on their practices and to see the potential for developing, nurturing and modifying these dispositions.

Furthermore, the VRE sessions make sure to approach agency as shared, and habits as being as much the result of environment as of humans. When VRE displays actual clinical situations such as putting on sterile gloves, safety is readily approached as a continual shared accomplishment based on complex interdependencies between healthcare professionals, teams, technical skills, bodily intuitions, discretionary practices and the organizational, practical, physical and technical environments. Thus, when VRE is used to reflect on mundane clinical practices, such as sterile gloving, it reflects the transactional and collaborative element of safety as a shared accomplishment. The ethical choice to not film the faces of the healthcare professionals makes the transactional element even more powerful, as it forces participants to not *a priori* attribute ‘safety’ to any particular ‘human’ or to any other ‘self-acting’ entities (Dewey & Bentley, 1949) but to stay in the clinical situation as the departure for inquiry. Thus, unlike spoken words, written texts or even photos, video displays the constant but often ‘invisible’ or backgrounded transaction of humans, environments and events. Because it consists of moving images, video reveals the seamlessness of connections between ongoing activities. In the case above, this transactional element is visible in the actual video sequences, in which the inseparability of human and environment is as obvious as Dewey’s (1922) example of the stoneworker who is nothing without support and assistance from objects and tools (p. 15). Maintaining a sterile work

environment, specifically putting on gloves, is an activity based on a complex mixture of elements such as the tidiness of the workstation, the technological environment, practised skills, routinized procedures, bodily intuitions, discretionary abilities of the healthcare professional and, not least, teamwork quality. But the transactional element of clinical practice is also visible in the VRE meeting. In the discussion about the different types of glove packages, the healthcare professionals act out their opening of the package using body language. Based on a recollection and reliving of their embedded habits and routines of opening the packages, they are *doing*, not just reflecting. This is what Dewey referred to as sensory consciousness (Dewey, 1923) or as muscle knowledge (Dewey, 1922).

VRE sessions initiate equally sensory consciousness, reflection and discussion about best practices, unsound habits, or appropriateness or inappropriateness of procedures, organizational setup and team efforts, while establishing a shared re-awareness of routine tasks and safety procedures from a transactional perspective. For the participating interprofessional team, this re-awareness is part of forming sound – or in Dewey’s (1922) words, more intelligent – safety habits or dispositions that are not just mindless repetitions but are formed on the basis of reflexive inquiring (see also Pedersen, 2018). Thus, while the glove session led to more formal ‘systemic’ changes – the cancellation of a particular glove brand and the ordering of more trolley tables – the most important opportunity for improvement might well lie in the development of shared safety dispositions of the participating healthcare professionals. Moreover, the more formal changes are of a specific character: by being exnovated on the basis of a bottom-up approach by using the VRE method, they are based on a comprehensive understanding of the complexities of introducing new ‘solutions’ to safety problems. The discussion about lacking the space for storing trolley tables attests to this. While all agree that the optimal place for putting on sterile gloves is on a clean and available trolley table, there is a situated acknowledgment of the difficulties of transforming such seemingly simple ‘ideals’ into actual practices that fit into established ways on the ward.

Discussion: a transactional and collaborative rethinking of patient safety

The introduction of a systems approach in patient safety management has led to a relative neglect of situated healthcare practices and the habituation, learning and collaborative efforts of healthcare professionals as the locus of safe care (Pedersen, 2016, 2018; Waring, 2015). In this paper, we demonstrate that rethinking patient safety and bringing the conduct of interprofessional practitioners ‘back in’ does not mean abandoning a focus on the work environment, technologies, organizational setup and wider healthcare systems that are vital to safety and quality in health service delivery. We hereby add to current analytical and methodological developments within patient safety our transactional approach to patient safety in which safety is understood as an accomplishment based on shared safety habits ‘done by’ and dependent on a mixture of elements including interprofessional teamwork, technologies, intuitions, organizational setup, skill, routines, discretion, procedures and

so on. From this perspective, it is meaningless to talk about safety practices from either a ‘persons’ or a ‘systems approach’ (Reason, 2000). Instead, clinical situations are ‘in-between zones’ (Mesman, 2008) where interfaces open up between what are usually approached as dichotomies, such as the general and the particular, actors and technologies, formal rules and individual experiences, facts and values. With a transactional stance, we become attuned to these ‘in-between zones’ in ways that are not possible if we readily accept safety as a feature of system design.

Apart from adding to anti-dualist and pragmatic thinking in current safety research and healthcare improvement studies (Le Coze, 2013; Furniss et al., 2019; Iedema et al., 2020, 2013; Pedersen, 2016, 2018), the transactional position developed in this paper also adds to broader debates in organization and management studies where scholars have raised concerns about the theoretical assumptions and practical consequences of the systems approach’s shift of attention from actors to systems. Here Peter Senge’s (1990) systems approach to the learning organization, for instance, has been criticized for a functionalist ontology that presumes that ‘systems exist “out there” as real entities’ (Caldwell, 2012, p. 10) with properties subject to causal analysis and leverage points of change. Caldwell (2012) further argues that in privileging a system-based construct of reality, the emerging properties of practices, action and learning in organizational processes are undermined. From another angle, the systems approach has been criticized for conflating the relation between individual learning and systemic learning where the focus is almost solely on ‘the system’s’ ability to learn – that is, to be optimized and re-engineered. Here, the individual learning process is treated in unspecific terms, and ‘the relation between individual learning and organizational problem solving is regarded as unproblematic, construed simply as a matter of the former meeting the demands of the latter’ (Elkjaer, 2001, p. 439). To this should be added teamwork and learning as collective processes, with a focus on participation in social communities and active engagement as differing from a more individual understanding of learning (Bond, 1997; McMurtry et al., 2016).

As we showed in this paper, a transactional approach might overcome these challenges of the system approach by focusing specifically on, for instance, safety or quality not as properties of a system but as an emerging practice and shared accomplishment that is highly dependent on the ability of individuals, teams and organizations to learn.

We further illustrated how VRE can be understood as a method that aligns with a transactional attitude, as it is designed to approach individual, collective and organizational learning on equal terms, and in close interrelation. Our example of a VRE session at a Dutch hospital’s neonatology ward is an illustration. The discussions at a VRE session about the ward’s gloving procedures showed that routines and habits for maintaining a sterile work environment, and more specifically of sterile gloving in the NICU, were dependent on several conditions: workstation tidiness, glove packaging, healthcare professionals’ skills and routines, the technological environment, formal procedures and guidelines, collaborative team efforts and so on. As an inquiry, the VRE session equally addressed questions of ‘organizational learning’ and system

optimization in the decision to drop one glove brand and to order new trolley tables, but the session was just as much about individual and collective learning for the participating inter-professional team insofar as the method seemingly increased reflexive and bodily awareness and supported the development and training of new shared safety habits (and the adaptation of old ones). Further, the more ‘formal’ changes of the environment (or system) were conditioned by a situated analysis of what was already present. In this way, it can be understood as an ‘exnovation’ (Mesman, 2011) based on an analysis of the often invisible mundane routines and hidden competences of practice that promote quality and safety in actual clinical situations. In foregrounding the accomplishment and complexity of everyday interprofessional work practices, we underline that the ‘ordinary’ is an extraordinary shared accomplishment that cannot be taken for granted – and that any ‘systemic change’ should at best nurture and at least respect – as in, not interfere with – this accomplishment.

Last, it is important to underscore that a transactional and collaborative stance does not rule out acknowledging or ascribing individual responsibility for safe or unsafe action. When safety is approached as a systems property – or when it is ascribed to common human factors such as cognitive failure, stress, fatigue – it is understood to be both unproductive and wrong to blame the individual healthcare worker, or indeed the team, for any unsafe conditions (Dekker & Leveson, 2015; Kohn et al., 1999). But from a Deweyan perspective, stating that safety habits and practices are transactional and therefore shared is not the same as saying that healthcare professionals are not to be blamed – or praised – individually or collectively for their contribution to this process. Dewey (1922) argued that it is just as wrong to assign blame exclusively to individual persons as it is to free them of responsibility by pointing to conditions in the environment. These are ‘equally ways of making an unreal separation of man from his surroundings’ (Dewey, 1922, p. 18). Dewey (1922) further stated, ‘The moral problem is that of modifying the factors which now influence future results’ (p. 19). That is, morals – and questions of responsibility and blame – are only relevant when linked to learning and change of habits. Here all conditions that enter into the production of habits must be taken into account, as should conditions such as ‘assigning blame and praise, of awarding punishment and honor’ (Dewey, 1922, p. 19).

Conclusion

The dominant systems approach to patient safety risks neglecting situated and collaborative healthcare practices as the locus of safe care with consequences for how safety in healthcare is conceptualized and safety management is practised. In this paper, we have drawn the contours of a transactional and collaborative approach to patient safety based on an operationalization of John Dewey’s pragmatism. With this approach, the practice of safe care should be seen as a transactional activity and shared accomplishment based on situated and emergent interprofessional practices and complex habits that ‘belong’ equally to technology, thoroughly reversed teamwork, bodily intuitions, routinized skill, organizational setup, clinical discretion, collaborative efforts and so on. We also propose that

a situational methodology such as VRE provides us a method of inquiry that can help interprofessional teams examine, explicate and learn from shared practices and concerted accomplishments from a transactional perspective.

Notes

1. Although Dewey sought to overcome the dichotomy between human and environment from the beginning of his career, it was only in his 1949 book *Knowing and the Known*, with Bentley, that he began using the word *transaction*. Previously, Dewey used the word *interaction* (see e.g., Dewey, 1922).
2. This transactional perspective is largely in line with, and has hugely inspired, actor-network-theory's principle of generalized symmetry, which states that the relation between human and non-human actors is an empirical question, not an *a priori* distinction (Latour, 2005), as well as notions such as 'socio-material entanglement' (Mol, 2002) and 'distributed agency' (Callon, 1986). More specifically, Barad (2007) proposed the concept of intra-action, with intentions similar to those of Dewey and Bentley. Intra-action is also supposed to replace interaction as a concept that presupposes pre-established bodies or entities that are interrelating. Thus, intra-action understands agency as a dynamism of forces and not as an inherent property of any entity (whether humans or technologies/systems).
3. Dewey was not alone in his interest in habits; both James and Pierce were also extensively engaged in discussions about habituation. It has even been argued that pragmatism in general is essentially concerned with neither cognition nor praxis as the end goal of inquiry, but with the production of habits (Hickman, 2007, p. 244).
4. Parents were informed that their child was admitted to a NICU that participated in a quality development project and that while filming the staff, their child could be captured on camera. Therefore, their consent was requested. It was stressed, that not giving consent would have no implications for the quality of the treatment and care of their child. They had the option to withdraw at any giving moment after giving their consent. In this paper, we show no pictures of patients.
5. Adapted from Mesman et al. (2019).
6. It was this impossibility of modifying habits by thought that led to Dewey's yearlong fascination with the work of the Australian educator Frederick M. Alexander, who had invented a technique for increasing awareness and modification of bodily habits, now known as the Alexander technique. With very close affinity to the idea of 'situated distance' of the VRE method, Alexander (1932) had experienced – among other techniques – that the use of mirrors could help bring about awareness of unsound bodily habits.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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