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Persistent institutional breaches: Technology use in healthcare work

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ABSTRACT

Various mobile phone applications (hereafter apps) challenge instituted ways of working in healthcare. This study explores the institutional breaches arising from the use of apps in doctor-patient interactions. This paper argues that institutional breaches, however small, are important occasions for observing the contextual intersections between healthcare, regulation and technology in a hospital setting. Based on healthcare professionals' normative judgements, the paper offers an empirically grounded understanding of institutional legitimacy-claiming; *safeguarding* responses deployed by the instituted regime, and the *case-building* responses deployed by the instituting persuaders. Institutional breach persistence arises from the moral dimension of legitimacy and is grounded in asymmetrical dynamics between two virtuous healthcare narratives. The paper concludes with a discussion of the contextual intersections between healthcare, regulation and technology, paying particular attention to institutional breaches as experimentation, the contestation of normativity and patterns of technology indulgency in healthcare work.

1. Introduction

New healthcare technologies that offer benefits to public health emerge almost daily. These new technologies often challenge instituted ways of working in healthcare (Greenhalgh and Stones, 2010; Mort et al., 2005; Petrakaki and Klecun, 2015; Currie et al., 2012a, 2012b; Lockett et al., 2012; Petrakaki et al., 2012) and are therefore disruptive – unsettling – not least because of regulatory and policy effects. Most studies exploring healthcare institutions emphasize the importance of developing stable, predictable, and trustworthy organizations (Yeung and Dixon-Woods, 2010). Recognising the importance of the broader institutional dynamics in healthcare work, a special issue of Social Science & Medicine (see Currie et al., 2012a) called for more inter-disciplinary interaction between medical studies and organization studies, particularly in understanding the significance of institutional dynamics in healthcare work (Currie and White, 2012; Lockett et al., 2012; Currie et al., 2012b). Drawing from this emerging literature stream, this paper explores how healthcare professionals respond to institutionally disruptive new technology, particularly non-clinical technology that is used in a clinical setting and as part of professional work. This inter-disciplinary literature draws attention to the importance of institutional dynamics in producing and regulating stable healthcare work (Currie et al., 2012b; Lockett et al., 2012), to keep at bay disruptive challenges, and ensure that a completely legitimate healthcare "organisation would be one about which no questions could be raised" (Tost, 2011: 688).

In this study, we use "institution" in the way that Barley (2008: 495) defines it: "as social forms or templates composed of clusters of conventions that script behavior to varying degrees in given contexts". In this way, healthcare institutions entail meanings that are often taken-for-granted and formed in earlier times and places (Berger and Luckmann, 1966), and consequently constrain and shape emerging possibilities. However, studies also show that institutional environments are plural (Kraatz and Block, 2008), with complexities and contradictions that compel reflexivity and enable actors to question taken-for-granted meanings and organizational conditions, and challenge the status quo (Greenwood et al., 2011). Nowhere is this more evident than in the interplay among healthcare professionals, the institutional ways of engaging in healthcare work – habitual, purposive, and practical – and the emerging possibilities of new technologies.

While there exist studies demonstrating that technology, particularly organization-wide IT systems, improve healthcare work practices (McGivern and Fischer, 2012), not all technology use follows this organization-wide pattern (Daskalopoulou et al. 2019b, 2020). In this study, we aim to bring analytical attention to what Star (2002) refers to as the 'institutional fringes' in healthcare work, where relatively minor

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new technology use can become a lively talking point, where judgements and values are questioned and scrutinized in the day-to-day practice of healthcare professionals. In as much as a formal large-scale IT system can bring about organization-wide change, new studies also recognize the importance of small-scale technology "activities which take place on organizational floors but bear the mark of the larger institutional waves that flood them" (Hallett and Hawbaker, 2020: 7). For example, there are various mobile apps including, Doctor on Demand, Epocrates, Medscape, MedPageToday, Read by QxMD, UpToDate, which help healthcare professionals to calculate dosages of medications or to identify more easily rare medical conditions by having access to online repositories of information as part of their daily consultation praxis.

Notwithstanding that these apps offer numerous benefits to healthcare professionals' work; the informal use and discretionary nature of these apps can present a spectrum of vexing challenges towards the taken-for-granted instituted ways of working in healthcare. Within a clinical setting, for instance, app use can (i), challenge the way patients perceive a non-clinical device being used in a clinical setting and the associated unprofessionalism of that activity; (ii) compel reflexivity on the boundary conditions surrounding the perceived intrusiveness of such devices as a result of the visual and audio recording capacity of mobile devices and patients' fears of doing this without their consent; (iii), weaken and blur the boundaries between work and non-work activities, while also eroding traditional notions of epistemic medical authority, setting new precedents of alternative ways or models of patientcare (Daskalopoulou et al., 2019a, 2019b). Despite being comparatively minor in nature, institutional studies show that when commonly held understandings are questioned, these can become a lively talking point within a profession, leading to field-level change (Micelotta and Washington, 2013; Currie et al., 2012b; Lok and De Rond, 2013). Institutionally, whenever commonly held understandings are questioned, then an institutional breach is seen to have occurred; that is, any unexpected act that violates or challenges norm-governing social relations and order (Zelditch, 2001).

This paper therefore makes the case for a greater focus on the contextual intersections between regulation, technology and healthcare work practices at the institutional fringes and the way that individual healthcare professionals handle threats to healthcare stability arising from disruptive challenges – something we illustrate through an in-depth exploration of the use of mobile apps by healthcare professionals (doctors) in a hospital setting. Exploring the use of mobile apps within healthcare is timely and is contextualized within the growing use of smartphones more generally. First, doctors are increasingly gaining ad hoc access to various technological platforms to cognitively support and enhance healthcare work. As these platforms have advanced and become more pervasive, traditional institutional scripts (i.e., handbooks of rules) have arguably become more fragmented, detached and inaccessible. Consequently, rules on the use of mobile phones are a focus of legitimate concern, with consensus still lacking amongst healthcare professionals. On the one hand, mobile phone use is increasingly judged as legitimate because its use is seen to espouse healthcare virtues, making a positive impact on patientcare. On the other hand, mobile phone use at work contests the traditional notions of epistemic medical authority, setting new precedents of alternative ways or models of patientcare.

Second, most health and social care employers have policies concerning the use of mobile phones at work, with mobile phone use at work generally viewed as 'a nuisance'. Typically, these regulatory policies clarify when, where and what mobile phone use is prohibited when healthcare staff are on duty and in certain areas of healthcare delivery. Mobile phone visibility ensures that it is fairly easy to identify what it means not to follow the policy. However, doctors who intentionally deviate from and contest the appropriateness of such hospital policy, render mobile phone use problematic.

Third, drawing upon the idea that regulatory disruption does not occur solely through 'traditional' instruments such as policy rules, the use of mobile phones by doctors, it could be argued, is not consistent with the expressive or symbolic signatures of healthcare values or virtues. For example, mobile phone use arguably attacks the value of 'human-to-human' relationships which are considered crucial for positive evaluations of medical outcomes (Petrakaki et al., 2018). Moreover, mobile phone use, is often seen as more expressive of 'recreation' as a practice. Overall then, the growing presence of mobile phones in hospitals and concomitantly the greater range of mobile apps used within healthcare settings, raises questions on their legitimacy – and this makes this a perspicuous setting to study.

Using an institutional perspective, several studies have shown how regulatory policy 'breaks down' on an individual basis within existing institutional orders (Heaphy, 2013; Herepath and Kitchener, 2016). These studies view regulatory disruptions as a form of institutional breach – that is, violating commonly held understandings, which, in turn, requires a variety of intervening practices to return to 'normalcy'. Research conceives of institutional breaches as 'a process of repair' via the skilful use of rules (Heaphy, 2013), comprising 'temporary or momentary breakdowns' (Barley, 1986), and consisting of 'small tears in the institutional script' (Lok and De Rond, 2013).

The intricacies of the healthcare context pose significant challenges for restorative interventions and ways to repair those institutional breaches in the normalcy of healthcare work. Institutional breaches typically prompt authoritative responses: restorative interventions that repair and thus maintain institutional legitimacy. The most visible forms of responses include, using the legitimacy of rules to restore, clarify, or initiate changes to maintain institutions (Heaphy, 2013), or the legitimacy of public inquiries to redress severe breaches (Herepath and Kitchener, 2016). Another powerful response, we argue, is institutional members' responses to maintain institutional stability in the face of disruptions. Here, the emphasis is placed on the evaluator's normative judgements to appraise, influence, and convey through communication, what behaviours or practices meet with approval or disapproval in mandated structures or practices (Meyer and Rowan, 1977). Critically, this perspective also offers an appreciation of the alternative sides of the institutional breach – one that is instituted and retains the status quo and another one that is instituting as a new practice. In doing so, it underlines regulatory policy disruption occasions where there are not always strict interpretations of rules, as right and wrong, or straight-forward procedural forms of enforcement, but conduct is guided by norms or beliefs about what is appropriate and approved of in a given healthcare context.

In order to study this, we pay attention to micro-foundations of social judgment formation (Bitektine, 2011; Tost, 2011) to develop an understanding of how healthcare professionals handle policy disruptions vis-a-vis normative judgements. This study draws on social psychology perspectives on legitimacy and a sub-set of the institutional literature in order to analyse healthcare professionals' judgements of everyday institutional breaches. This study has three main theoretical contributions. First, we contribute to healthcare literature by providing finer granularity of how regulatory policy 'breaks down' on an individual basis within a healthcare setting. This contribution is developed, first by showing how the informal use of new technologies results in institutional breaches, and second by broadening our understanding of how individual healthcare professionals' normative judgements, particularly high-status individuals', are consequential. In doing this, we respond to calls to shed light on the internal dynamics of legitimacy-claiming – a perspective from within rather than a perspective of external stakeholders – and analytical variation in forms of agency beneath the field or organisational level of analysis (Heaphy, 2013).

Our second important contribution concerns the nature of institutional breaches. By identifying the normative judgements working on disruptive policy breaches – *safeguarding* and *case-building* – we demonstrate the two-sided dynamics of institutional breaches in the course of everyday healthcare work. We highlight the 'softer aspects' of

institutional restoration beyond the 'hard tools' of repair (rules or public inquiries, see Heaphy, 2013; Herepath and Kitchener, 2016); the importance of the institutional fringes in working with new technology (Star, 2002), in this case mobile apps, but also the breaking down of long-established instituted 'encrusted obstacles' (Suchman, 1995) and medical practices.

Our third contribution shows how the persistence of breaches is a fruitful means of understanding institutional maintenance. Our analysis departs from, but complements, the institutional breach as 'a process of repair' perspective and shows the persistence of institutional breaches grounded in the moral dimension of legitimacy and the asymmetrical dynamics between two virtuous healthcare narratives. Each side of the breach can be equally right. Our findings show a complex intersectional context, rather than a binary opposition between two normative positions. Here, there are no short-term resolutions to reinstate the social order, with mobile technology given 'just enough' agency to prevent institutional harm, to safeguard and with 'rumblings of repair' (Clark and Newell, 2013) to integrate within the institution. This helps to understand a different side to institutional breaches – the persistent one – and this has been largely missing in previous research on legitimacy in healthcare settings.

2. Theoretical development

2.1. Persistence of legitimacy threats in healthcare

Legitimacy is a key institutional concept in understanding the contextual intersections between regulation, technology and institutional practices (Ruef and Scott, 1998; Currie et al., 2012a, 2012b; Herepath and Kitchener, 2016). Legitimacy not only enhances the survival of healthcare institutions, but also shapes the ways in which individual members come to view both stability and change as desirable and necessary (Tost, 2011). Legitimacy is defined by Suchman (1995: 574) as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions." Legitimacy operates as a social accomplishment, something that is transmitted over time, with continuous search for alignment or fit with professional value systems, or managing societal and stakeholder demands, thereby invalidating and bringing the unaccepted into accord with accepted norms, values, beliefs, practices, and procedures (Zelditch, 2001).

There have been numerous explorations of the concept of legitimacy in social science and medicine studies, studying for example, healthcare legitimacy-building in communities (Martin, 2008), or how legitimacy is rebuilt (Herepath and Kitchener, 2016). Overall, legitimacy is viewed as a valuable attribute for maintaining the stability of institutions in the face of regulatory disruption (Ruef and Scott, 1998; Currie et al., 2012a). This is important because healthcare settings are particularly 'rule saturated' and litigious, with high emotionality (Heaphy, 2013). This makes them particularly vulnerable to regulatory and policy violations (Faulkner and Kent, 2001).

From an institutional perspective, maintaining legitimacy is dependent on conformity or fit with prevailing external norms, moral rules and regulations and this provides field stability in the face of disruption (Suchman, 1995). To keep at bay challenges, healthcare institutions pursue tight alignment with social norms, rules and with external stakeholders (Tost, 2011). Yet studies do show the presence of agency, in various forms and guises. Arguably, one of the most persistent instituted challenges in healthcare work, emerging almost daily, are new technologies (Greenhalgh and Stones, 2010; Mort et al., 2005; Petrakaki and Klecun, 2015; Petrakaki et al., 2012). For example, Barley (1986) shows how institutionalised roles keep at bay large challenges while Ruef and Scott (1998), trace out the legitimacy struggle through institutionalized myths propagated by managers and medics. Reay et al.'s (2006) study also provides insights into the agency arising from introducing a new work role – the nurse practitioner – into an established healthcare system. Heaphy (2013) shows how patient advocates engage in 'ready-made' sets of rule practices – explaining rules, coaching others about the rules, documenting according to the rules and switching between rules to keep at bay small-scale, everyday disruptions to institutionalised roles and patterns of interaction. These studies show that healthcare professionals do not always act in ways that are consistent with institutionalized roles and patterns. Elsewhere, studies have argued along similar lines, identifying skilful 'institutional entrepreneurs' able to envision new practices or bottom-up processes of institutional emergence (Marti and Mair, 2009). Because our study focuses on individual-level judgements of legitimacy we now integrate and synthesize the social psychological perspective to deepen our understanding of legitimacy.

Social psychologists study legitimacy from the view of internal judgements in support of rules and procedures (Bitektine, 2011; Tost, 2011). Legitimacy is framed around ideas of deference and obedience to rules or authority and is defined as "the belief that authorities are entitled to be obeyed." Legitimacy is an expression of individual judgements and perceptions and these act as the key 'micro-motors' (i.e., instrumental, relational and moral) in deciding if an entity is legitimate or illegitimate (Tost, 2011). The shifts in individual judgements and perceptions are critical for understanding how behaviours are guided and how patterns of social interactions emerge, and ultimately, how these coalesce to constitute collective-level legitimacy. Much of healthcare research has focused on field-wide events, formal regulatory, technology or cognitive threats, which raise 'collective' external stakeholder legitimacy concerns. However, while disruptions are persistent and ubiquitous, they are auxiliary to institutional processes. An emphasis on the institutional micro-foundations of judgment formation (Bitektine, 2011; Tost, 2011), can highlight how new technology produces new institutional dynamics and values.

2.2. Institutional breaches in healthcare work

Internal legitimacy judgements maintain stability but also create pressures for healthcare institutions (Orlikowski and Barley, 2001). Thus, legitimacy claims are socially entwined within the ongoing tensions between the 'instituted' and 'instituting' practices where individuals can disrupt institutions and challenge ways of acting based on unsatisfied grievances, dwarfed expectations or aspirations for change. Bouilloud et al. (2019) note that the instituted is viewed as the established frame of institutions, what is given, visible and easily identifiable, the established order such as schedules, laws, norms and conventions. Institutional structures and arrangements provide the power of stability, resilience, and endurance, and resist challenges and challengers (Meyer and Rowan, 1977). Instituted established orders act as a stabiliser of what is deemed legitimate or not. By contrast, the instituting comprises the questionable, contingent and unfinished nature of any established order. It denies, challenges or questions the existing state of affairs (i.e., the instituted) in various ways and through various actors. The instituting perspective suggests a rather contested legitimacy status, one which shows varying degrees of instability, erosion and legitimatising alternatives. The instituting perspective would suggest that threats or challenges can persist. Understanding of the ongoing tensions between the instituted and instituting practices of new technology provides a useful analytic for shifting the focus away from the large-scale, on-off disruptive occasions when actors face technology or regulatory 'jolts', towards the much less visible contradictions and reflexivity in the everyday lives of healthcare professionals.

Breaches are a form of disruption to institutions (Heaphy, 2013). An institutional breach is any unexpected act that violates or challenges the norm-governing social relations and order (Zelditch, 2001). Dealing with institutional breaches is part of the larger, necessary work of maintaining institutions and strengthening their predictability and trust (Zelditch, 2001). Different conceptualizations have emerged on institutional breaches, including the idea that they comprise 'temporary or

momentary breakdowns' (Barley, 1986), are something to 'bandage and smooth over' (Lok and De Rond, 2013: 186) and are something that needs to be addressed with urgency so that the 'reservoir of support' is not damaged (Tost, 2011). For instance, prior research identifies several restorative interventions including, reversing an imposed institutional change to re-establish the status quo (Micelotta and Washington, 2013), negotiating the regeneration or recreation of institutional arrangements (Currie et al., 2012b), justifying the breach in terms of unique contextual circumstances (Lok and De Rond, 2013) and achieving field-level institutional repair through government inquiry (Herepath and Kitchener, 2016).

At least two limitations can be discerned in this literature. First, the 'repair-mode' approach means that rarely are institutional breaches viewed as a way to enhance institutions. Most studies conceive of them negatively, as a threat or an attack (Lok and De Rond, 2013). However, Marti and Mair (2009) highlight unexpected positive effects and argue that innovations can originate from sites of institutional breaches. Such small-scale, everyday breaches may be especially common where high-status individuals (i.e., doctors) dislike or reject certain aspects of their role or where there are new or alternative technologies that can deliver better patientcare. Marti and Mair (2009) identify a range of possible conditions where breaches are possible, indicating ways in which to open them up as sites of debate. For example, pursing advocacy practices, lobbying, advertising and litigation (Suchman, 1995). However, using these practices might not be possible in healthcare settings densely packed with rules and regulation. Second, while the persistence of breaches is mostly framed as untenable, particularly where there is reputational damage, or if it harms the legitimacy of the institution (Herepath and Kitchener, 2016), there are other circumstances where institutional breaches persist (Marti and Mair, 2009). These can include situations where there are; 'degrees of tolerance' depending on particular circumstances (Lok and de Rond, 2013); 'rumblings' of repair that provide 'just enough' to preserve (Clark and Newell, 2013) or 'stubborn legacies' from the past which are worked around, ignored or even avoided (Marti and Mair, 2009). Our study aims to address these limitations by looking into technology breaches in healthcare work. In order to fulfil this aim, we focused on understanding our informants' legitimacy judgements of mobile app use. We describe our methodology in the following section.

3. Methodology

3.1. Data collection

We followed an interpretivist epistemology (Crotty, 1998). Data collection occurred over a one-and-a-half-year period between January 2015 and April 2016 in the U.K. National Health Services (NHS) context. To carry out our research we partnered with an NHS Trust in the North West of England. Specifically, the first author conducted thirty-two in-depth interviews with healthcare professionals (i.e., doctors, across 12 specialties such as plastic surgeons, orthopaedic surgeons, pulmonologists, A&E (accidents and emergency) consultants, and otorhinolaryngologists amongst others). The grades of doctors are presented as JHP (junior healthcare professionals, up to Consultant level) and SHP (senior healthcare professionals, Consultant level). Consultants are in the UK the equivalent Attending physicians in the US. We recruited our informants via a global email invitation and in-person during clinical hours. We identified potential informants purposefully based on their role and engagement with mobile phone technology. Interviewees were also selected in a snowballing manner; previous interviewees provided recommendations for additional informants. In studying institutional breaches within the context of mobile phone use in a healthcare setting, we asked interviewees to comment on instances of mobile phone technology use in their day-to-day healthcare work. Our informants discussed their experiences with mobile applications (apps) that support different aspects of clinical decision making such as diagnosis, treatment and monitoring. Examples of mobile apps used by our informants include the British National Formulary (BNF) app and the BNF app for Children that provide information about medicines and identify interactions between a combination of drugs. Our informants also relied on specialty-specific apps such as goniometric (angular measurement) apps for orthopaedic surgeons. In our context, mobile app use was not introduced at an organizational level. The NHS Trust did not mandate the use of mobile apps, it rested on the discretion of individual healthcare professionals to use them. However, hospital management supported the use of mobile apps and has introduced a Bring-your-own-device (BYOD) policy.

All interviews (up to 90 min; average interview 50 min) were audio recorded and transcribed verbatim. In the course of the interview, we used open-ended, non-directive questions and probes in order to elicit rich responses from our informants (McCracken, 1988). Pseudonyms were used to ensure the anonymity of interviewees.

We designed our research and carried out data collection in line with NHS research governance frameworks, which mandate collecting a signed informed consent from all interviewees and the confidential handling of anonymized data. All informants received a 'participant information sheet' explaining the aims of the research, and the interview process and were encouraged to ask questions about our study during the interview. Ethical approval was gained from the first author's University and our study was also reviewed by an NHS Research Ethics Committee which granted us approval to commence data collection. We stopped collecting additional data when theoretical saturation was reached in terms of emerging themes in our dataset (Glaser and Strauss, 1967).

3.2. Data analysis

Like in all interpretivist approaches, data analysis was a part of an iterative process that involved continuously moving back and forth between conceptualization, data collection, data analysis, and theory building (Strauss, 1987). As a result, our findings emerged inductively, through a modified grounded theory approach (Charmaz, 2014). Specifically, we analyzed our data manually following a constant comparative logic (Glaser and Strauss, 1967) of coding, categorizing, and abstracting. Coding techniques, such as open, axial and selective coding were used throughout the data analysis process, which led to the creation of themes and sub-themes (Alvesson and Skoldberg, 2000). We developed our initial codes by analyzing several times the textual data from the in-depth interviews. By engaging with prior theory, we then refined our analysis and developed our emerging codes into axial codes (Alvesson and Skoldberg, 2000). The first author carried out the data analysis independently, however, emerging codes, categories and themes were presented for discussion to the entire research team in order to ensure the coherence of data analysis.

4. Findings

4.1. Instituted safeguarding judgments

In this section we describe the instituted ways of *safeguarding* healthcare professionals against institutional breaches and protecting non-users. We find that although healthcare professionals introduce mobile apps in their work (an institutional breach), they strive to *safeguard* the long-lasting instituted practice of human-to-human relationship with their patients (Daskalopoulou et al., 2019a; Petrakaki et al., 2018). In terms of protecting non-users, this suggests the significance of attending to patients' needs and feelings:

> *'I think if you use it [mobile apps] in more of a patient friendly way, to aid patients and to help them in regards to things, I think it's a good resource to have [..] it helps the patient know what's going on, with the decision process and the knowledge and information they have.'* (Greg, JHP)

Greg's narrative illustrates that the use of mobile apps must safeguard patientcare. As such, technology should be used in a 'patient friendly way', 'to aid patients'. We find that healthcare professionals, safeguard the non-users (here patients) by not allowing the technology to overshadow the doctor-patient interaction. Instead, they attempt to communicate its value for patients so they can 'know what's going on'. Explaining to patients what is happening helps to alleviate unnecessary doubts and anxiety. Similarly, Paul's narrative illustrates how he safeguards his patients' feelings:

> *'It's very embarrassing to ask patients about their weight [..] so, I do a little calculation. [He tells the patient:] "well, let me show you; the green is where you should be, you are not even in the yellow, you are over in the red." [..] I do that at the bedside quite a lot now because it is elegant and simple and has got the backup of the NHS but it's not me being personal.'* (Paul, SHP)

Paul explains how he uses a mobile app in order to discuss in a more sensitive and subtle way a diagnosis that could be perceived as judgmental by the patient. Paul's example illustrates a delicate situation during which he managed to use the mobile app in accordance with established norms and conventions (Bouilloud et al., 2019) of communicating with a patient. Paul was able to protect his patient's feelings and pride because it was not him 'being personal', it was an NHS-backed system that provided a fair estimate about their weight.

Paul's quotation also highlights another aspect of instituted safeguarding judgements. He notes that the mobile app he uses 'has got the backup of the NHS', suggesting that it follows official rules and regulations. We find that healthcare professionals draw support from official regulatory structures such as local bring-your-own-device (BYOD) policies and national NHS mandates in order to *safeguard* themselves against institutional breaches. In the following quotation, Jess describes why it is important to ensure that mobile apps follow official guidelines:

> *'We should either prescribe one [antibiotic] according to the BNF [British National Formulary], or if there is one [antibiotic] according to Trust policy, so if I were to prescribe a medication on advice from an app that is from a different country, and something were to happen because of this, I would not be able to defend myself because I am not supposed to use it.'* (Jess, JHP)

Jess' narrative illustrates that it is in the self-interest of healthcare professionals to follow official guidelines (Scott, 2014) in order to protect themselves from institutional breaches. Jess' take reveals the impetus of adhering to the established frame of institutions (Bouilloud et al., 2019) by using technology that follows official guidelines issued by healthcare organisations such as the BNF or local NHS Trusts in order to ensure that healthcare professionals will be supported if something goes wrong.

Finally, we find that in order to *safeguard* themselves against institutional breaches, some healthcare professionals even refrain from challenging the status quo by not using mobile apps openly. This strategy protects healthcare professionals from misinterpretations of their intentions during an interaction, e.g., from being challenged for not focusing on the patient. For example, Emma (JHP) explains why using a mobile app is seen as an institutional breach: 'because it's on your phone and they [patients] might feel that you're ignoring them, not paying enough attention. I tend to do it before they come in'. Jacks elaborates further.

> *'I think some patients may think that's inappropriate, because some people may see using one's phone as anti-social, and it may not be acceptable to get your phone out in front of them.'* (Jacks, JHP)

Jacks' and Emma's quotes explain why healthcare professionals interpret using mobile phones as an institutional breach. Healthcare professionals expressed that everyday judgemental evaluations of mobile phones as non-clinical objects suppress their use (Bitektine and Haack, 2015). Both Jacks and Emma felt that patients would focus on the non-verbal cues about the material artefact (mobile phone) without relying on verbal messages (from themselves, as doctors) or information from previous interactions or the broader context of the situation. Using mobile phones is still considered a niche practice in healthcare, thus patients might not be able to draw on prior experiences. Interestingly, not using mobile phones openly in front of patients allows healthcare professionals to sustain a sense of normalcy during doctor-patient interactions and to also seize the benefits of the technology by using mobile apps when they are beyond patients' reach.

To sum up, *safeguarding* healthcare professionals against institutional breaches and protecting the non-users, contributes to the legitimation of mobile app use, by framing it as a social practice that is not in contradiction with instituted modes of healthcare delivery and does not violate any formal regulatory structures.

4.2. Instituting case-building judgments

In this section, we describe the instituting *case-building* ways of legitimising new technology use that occurs amongst users and non-users. We show the ways in which healthcare professionals challenge, question and try to shape the existing way of affairs (i.e., the instituted) (Bouilloud et al., 2019; Suchman, 1995). We find that healthcare professionals engage in three types of *case-building*; 'grafting', 'amplification', and 'transparency and framing'. Specifically, we observed that healthcare professionals' case-building hints at legitimation in the organization indirectly via the patients rather than directly to management.

We find that 'grafting' enables healthcare professionals to integrate mobile apps within current working routines and interactions (Purdy and Gray, 2009). 'Grafting' efforts involve carving a space for mobile apps, when there is a relative advantage. Ian provides an example:

> *'In A&E [accidents and emergency department], and the doctors who are on call, are the ones who are usually using it [mobile apps], because of the number of patients that they have to see, and the apps would be very helpful because they save time [..], instead of having to look for a computer which may not be accessible at the time.'* (Ian, JHP)

This extract justifies the 'grafting' of mobile apps in current processes by illustrating its benefits. Ian explains that using mobile apps can improve outcomes for healthcare professionals, e.g., 'save time'. Greg elaborates further:

> *'Let's say [patients] have a knee injury and a minuscule tear, I can explain to them what that is, and the app has a little bit more information with regards to some figures and pictures, about what exactly is going on with the knee, where the tear is, what the problem is, and how it looks when the operation is done. They have sort of a visual understanding of what goes on. It helps me with regards to my discussion, it makes me sure that they had an adequate amount of information before they decide if they want to proceed and do it.'* (Greg, JHP)

When healthcare professionals 'graft' mobile apps, they challenge the long-lasting instituted convention of maintaining the human-to-human relationship in healthcare interactions (Petrakaki et al., 2018). As such, healthcare professionals need to enable all parties to perform well in their roles. In this example, Greg discusses openly the benefits of using the app and explains how the app can help the patient to understand what is going on.

With 'grafting', as a form of *case-building*, healthcare professionals are able to illustrate the appropriateness (Scott, 2014; Suchman, 1995) of mobile use by 'testing it out' in different contexts. By introducing mobile app use in different situations, as in Ian's example of being 'on-call' or during doctor-patient interactions, healthcare professionals are helping to construct a positive, shared understanding about mobile app use. Therefore, 'grafting' contributes towards limiting the confusion

associated with mobile app use and helps to pre-empt judgements about this non-clinical object.

Our analysis also reveals a second form of instituting *case-building*: 'amplification'. 'Amplification' refers to highlighting the positive aspects of mobile app use in order to enhance its acceptability. As such, the goal of 'amplification' is to illustrate the desirability (Suchman, 1995) of mobile app use by explaining the advantages that healthcare professionals and patients can derive from it. Jane explains:

> *'I always recommend people to use it. I do a lot of teaching to junior doctors, and every time I teach I show them "that's what we've got, and if you don't have it then please download it, use it and then it's easier to report any potential problems.'* (Jane, SHP)

This quotation shows how 'amplification' can help to reconstruct the public discourse around mobile app use. Jane helps to amplify the belief that mobile apps fit within existing work routines and practices by explaining how they can be used. As such, she focuses on the positive aspects of the technology, which are prioritized over other aspects. In the following extract, Tony discuses another example of 'amplification':

> *'[I] say that to all new people coming through, oh by the way you should be using the [name] mobile app because it'll give you the same information that you're getting, but it will allow you to do a little bit more.'* (Tony, SHP)

Similarly, Tony amplifies the advantages of mobile app use in comparison to other modalities. This extract also explicates the importance of 'amplification' in order to communicate to newcomers that the technology is culturally supported by the organization (Scott, 2014).

Finally, we find that healthcare professionals engage in a third form of instituting *case-building*: 'transparency and framing'. 'Transparency and framing' refer to ensuring that the use of mobile apps is clear and straightforward for all the parties involved: 'Sometimes I use my phone as a torch, so I'll let patients see the screen, so they know I'm not taking a photo, that I'm not answering a text' (Brendan, SHP).

Brendan's quote illustrates the importance of 'transparency and framing' during an institutional breach. Brendan achieves this by showing his patients the screen of his mobile phone. Doing that, he ensures that the patient understands what is happening and therefore eliminates potential judgements, e.g., thinking that he is 'taking a photo'. By being open and transparent, he is able to frame using his phone as an appropriate action. Victor provides a similar example:

> *'I may sometimes look something up [on the mobile app] to prescribe something, I do explain; "let me just look that up". With the phone, I'm more conscious of the fact that it may not be seen as appropriate by somebody.'* (Victor, JHP)

In this quotation Victor highlights how he uses verbal ques in order to communicate to the patient how he intends to use his phone: 'let me just look that up'. As we exemplified earlier, healthcare professionals recognize that patients' viewpoint is vital and that without 'transparency and framing' technology use might be detrimental for the doctor-patient interaction.

To recap, performing instituting *case-building* enables healthcare professionals to shape beliefs and norms about the relevance and value of mobile app use amongst users and non-users. Through 'grafting', 'amplification' and 'transparency and framing', healthcare professionals are essentially questioning and shaping accepted cultural values and conventions about the use of non-clinical objects in healthcare.

5. Discussion

At first glance, using a mobile app appears somewhat trivial and non-disruptive, particularly when viewed against other healthcare technology and other forms of disruptions (for example, the CT scanner, Barley, 1986; or a pandemic crisis). Our analysis however reveals some interesting institutional dynamics where healthcare professionals (re-) consider and (re-)evaluate their attitudes. In particular, Currie et al.'s (2012a) special issue assembles and advances the stream of literature between medical studies and organization studies and this can help us frame mobile app use from the healthcare techno-regulatory-approach and consider it from an institutional perspective. As Yeung and Dixon-Woods (2010: 505) note, new technologies are not simply technical solutions: "they also embody values and versions of rationality." Institutional meanings concerning the use of the mobile phones is not eternal, particularly when the technology conditions are not actively problematized and evolve with the emergence of new apps. While a mobile app might not threaten the long-lasting instituted practice of human-to-human relationship with patients any more or less than the use of a stethoscope or the BNF in its original book format, it is nonetheless important to pay attention to how these small-scale 'fringe' technologies come into being through the institutional micro-foundations of social judgment formation (Bitektine, 2011; Tost, 2011).

Healthcare breaches as virtuous experimentation. Our findings identified two-sides of small-scale breaches; a precautionary narrative of individualized safeguarding, and a case-building experimentation narrative. Critically, these vocabularies both speak to some of the values of healthcare – protecting patients – but also the virtuous narratives of healthcare professionals – autonomy, innovation etc. – and together, provide the moral dimension of legitimacy to curtail breach repair events. We find that healthcare professionals' judgements, in part, reflect this virtuousness where individuals are behaving in ways that nurture human life. In this respect, healthcare values and the moral virtuousness of the breach hold substantive, content-based evaluation at bay. The pursuit of virtuousness is therefore complex, challenging and not as straightforward as policy documents might suggest – both sides of the institutional breach are persuading us that they are 'doing the right thing' for patients. Grounded in a moral dimension, a virtuous institution is one that espouses and nourishes an environment of moral goodness, makes a positive impact on the experience of its members, and ensures that this positive impact extends to the greater community (Cameron et al., 2004).

We find that the persistence of breaches is essential for institutional experimentation. Persistent breaches are a fruitful means for understanding how institutional virtues are made incarnate and are institutionally, rebuffed, or reworked, and integrated into institutional norms. Institutional virtuous norms are discussed in the literature as quasi-independent from individuals. In our study, individual healthcare professionals' values embodiment figures prominently in the actual micro-processes of healthcare institutions. We also show the remarkable plasticity of institutions, how healthcare professionals assign meanings to new practices to make them consistent with normative expectations of healthcare work and to maintain a sense of the shared voice (Garfinkel, 1967).

Contested normative judgements. Most studies exploring legitimacy in healthcare institutions emphasize the importance of developing predictable and trustworthy organizations (Yeung and Dixon-Woods, 2010). Our findings show how different healthcare professionals' judgements claim that legitimacy. While using mobile apps is often seen as technical inevitability not all healthcare professionals are accommodative of experimentation. At the same time, the breach conditions break down established instituted ways and forge new paths of practice in healthcare. Here, the institutional breach does not threaten healthcare professionals in a privileged position; that is, they do not face threats to their status from mobile apps in substituting their labour. In addition, there is an institutional tolerance perhaps because of the healthcare professionals' "professional dominance" (Currie et al., 2012a), who, in turn, enhance their authority, expertise and control over service provision. This is integral to both legitimacy-claiming arguments: "a justification always connects the unaccepted or unacceptable with accepted norms, values, beliefs, practices, or procedures" (Zelditch,

2001: 7). Institutional beaches therefore remain open for envisaging new ways of doing healthcare work with mobile apps. In this way, our findings deepen Clark and Newell's (2013) notion of 'rumblings of repair' which are not clean-cut restorative interventions but rather are a form of jockeying between normative positions. This jockeying together provides 'just enough cover' for each side of the breach to simultaneously contain it and preserve the instituted order, while also permitting openings and tolerance for experimentation.

Small observatories. Marti and Mair (2009) refer to the importance of small, provisional institutional arrangements which are resolute and gradual in facilitating access to and broaden the scope of existing institutions. Institutional breaches, however small, are therefore important occasions for observing how social order is (de/re-)constructed. This *minutia* is something that is strongly underlined in our findings and in line with the work of Garfinkel (1967) on 'accommodative work' and with Gouldner's (1954) notion of 'indulgency patterns'. We find that policy responses are pragmatic about what works depending on the situation, with rules governed through a regime of leniency and interestingly enough we observed no instances where breaches were escalated into disciplinary procedures. Unlike deploying 'hard restorative tools' in institutional breaches (Heaphy, 2013; Herepath and Kitchener, 2016), small-scale breaches of mobile phone use brought about a variety of normative judgements. We suggest 'engaged with' rather than 'closed down' as small-scale breaches remain a fluid situation and institutionally persist. When being discreet about, or overlooking small-scale breaches, habitualized behaviours can form and have the potential to touch and alter institutionalized patterns of interactions elsewhere in the institution (Herepath and Kitchener, 2016).

Micro-level legitimacy claiming and macro-level legitimacy processes. Small-scale institutional breaches can be reflective of the larger healthcare system because they can 'join up and accumulate' and add insights into the turning of small "wrinkles into significant tears in the institutional fabric" (Reay et al., 2006: 994). Moreover, numerous conclusions from healthcare public inquiries point to managerial oversight of small-scale institutional infringements – sometimes referred to as a 'systemic culture' of failings (Herepath and Kitchener, 2016), without interrogating more closely the nature of the small-scale institutional breaches and how those can unintentionally produce much larger failures and threats. In this respect, our micro-institutional findings provide insights of the contextual intersections between healthcare, regulation and technology, thus extending research on the broader macro role of legitimacy and understanding how institutions, including healthcare, are infused with multiple values, norms, and logics that guide behaviour in sometimes contradicting ways (e.g., Currie and Spyridinidos, 2015; Thornton et al., 2015).

Practical implications. Healthcare professionals ought to be sensitive to, and reflective about, the emotive nature of normative judgements when observing an institutional breach. In experiencing a breach, healthcare professionals can feel upset and a sense of moral indignation. Whenever non-clinical devices are used, particularly if there is an emergency, there can be an awkwardness and uncomfortableness concerning the invasive nature of devices. Legitimacy can therefore be undermined.

At the other extreme, a 'zero tolerance' approach can raise different types of issues. Sensitivity towards both sides of the breach is required. Both are making legitimacy-claims. Recognising the critical moments in the journey of legitimacy and shifts towards validity-seeking are critical in reaching consensus. Reflecting upon and discussing the policy on mobile phone use in hospitals in relation to current practice, revisiting the rule's meaning and the status of compliance is a worthwhile activity. It is incumbent that case-builders keep patients informed and that meaning is assigned to the activities in such a way that it is sensitive to the stability of the institution and the smooth running of the hospital. Given the ambiguity between strict policy and guidelines requires broader discussions between healthcare staff in order to strike the right balance. Overall, managers should focus on the practice collectively rather than on what is violated or who is the violator.

Limitations and Future research. Our study was limited to a single group of healthcare professionals within one NHS Trust in the North West of England. We focused on individual-level judgements, however, as Bitektine (2011) notes, legitimacy evaluations do not exclusively take place at the micro level – that is, with individuals (Tost, 2011) – but also encompass sensemaking of collective actors, an area that can be further explored in future research. Small-scale, everyday breaches may be equally common with other aspects of non-clinical technology use in hospitals and these merit further research. The issue of how individual-level judgements build more collective-level validity is an important consideration and could be explored further. Future research is therefore needed to explore other clinical-centred technologies, healthcare work settings and healthcare professionals, including nurses and paramedics.

Critically, future studies must explore further the agency of patients in institutional breaches and their normative expectations. Our study is limited to a public, NHS Trust where the persistence of an institutional breach might be influenced by public monetary and fiscal resource pressures. When other pressures on healthcare are intense, such as maintaining patient safety with shortfalls in staff, healthcare professionals might face the prospect of minor breaches occurring 'on their watch'. Building on these insights, additional studies can investigate how institutional breaches stretch institutions at the fringes.

Our study has shown how (de)responsibilization works in mobilizing healthcare professionals and persuading them to assume responsibility for handling disruption and supporting existing healthcare values. Future research could go further in exploring the micro-level work dynamics of responsibilization, particularly the 'politics of responsibility' and the wilful exoneration of responsibility, or the practice of deresponsibilization whereby technology can assume more agency. Building on these insights, further studies could explore in more detail role constellations and the various micro-level rhetorical strategies.

While everyday normative judgements could be viewed as 'soft measures', our findings show how powerful such normative judgements were at different points and on different sides of the breach. More research, however, is required on the ways in which judgemental discourses interact to reinforce norms, how technology values interact with social values and how norms are (de/re-)constructed during institutional breaches.

Finally, our data collection was limited to small-scale, everyday disruptions. Future research might explore the linkage between the characteristics of healthcare professionals' everyday work and disruptions caused by large-scale systems or crises such as a global pandemic. Small-scale breaches are always part of larger social occasions and a broader web of relations blurring boundaries between professional identities and autonomy, science and politics, technology and values and healthcare and business. Macro-level breaches in the healthcare system may occur differently across systems of healthcare. Future research could examine these broader regulatory influences through an institutional logics perspective.

Credit author statment

Conceptualization Ideas; formulation or evolution of overarching research goals and aims Dr Athanasia Daskalopoulou, Prof Mark Palmer. Methodology Development or design of methodology; creation of models. . Dr Athanasia Daskalopoulou, Prof Mark Palmer. Software Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components N/A. Validation Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs Dr Athanasia Daskalopoulou, Prof Mark Palmer. Formal analysis Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data. Dr Athanasia Daskalopoulou,

Prof Mark Palmer. Investigation Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection. Dr Athanasia Daskalopoulou. Resources Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools. N/A. Data Curation. Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later reuse. Dr Athanasia Daskalopoulou. Writing - Original Draft Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation). Dr Athanasia Daskalopoulou, Prof Mark Palmer. Writing - Review & Editing Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre-or postpublication stages. Dr Athanasia Daskalopoulou, Prof Mark Palmer. Visualization Preparation, creation and/or presentation of the published work, specifically visualization/data presentation. Dr Athanasia Daskalopoulou, Prof Mark Palmer. Supervision Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team. Dr Athanasia Daskalopoulou. Project administration Management and coordination responsibility for the research activity planning and execution. Dr Athanasia Daskalopoulou. Funding acquisition Acquisition of the financial support for the project leading to this publication. N/A.

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