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White Coats at the Coalface: The Standardizing Work of Professionals at the Frontline

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Abstract

This study advances theory on professionals by introducing a novel 'coalface perspective' to study frontline professionals' standardizing work. Our multimethod quantitative and qualitative approach explores when, why and how medical professionals in German university hospitals actively maintain care pathway enactment – a technique to standardize day-to-day medical work – in their everyday patient treatment. Professionals' actively standardizing their work is an understudied yet highly relevant phenomenon that the established 'autonomy perspective' – which covers how professionals resist standardization – falls short of explaining. Introducing a coalface perspective overcomes this shortcoming by uncovering novel links between professionals' day-to-day problem-driven motivations for standardizing work, the characteristics of everyday situations of frontline professional work and practices of standardizing work at the frontline. This study has implications for research on frontline professionals and coalface-perspective research in general.

Keywords

care pathways, coalface, frontline professionals, standardizing work

Introduction

Professionals working at the frontline – that is, professionals providing services for clients, customers or patients – depend on both autonomy and standardization (Abbott, 1988; Jamous & Peloille, 1970). Autonomy refers to a professional's right to choose how to execute procedures (Freidson, 2001). Standardization, in contrast, refers to practices for making frontline professionals' procedures and outcomes consistent and comparable (Abbott, 1988; Timmermans & Berg, 2003). Much

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research has focused on how frontline professionals – in medicine (McDonald, Waring, & Harrison, 2006), science (Bruns, 2009) and accounting (Demski, 2002) – *resist standardization*. However, we know surprisingly little about when, why and how frontline professionals *actively maintain standardization*; that is, do standardizing work. This 'relatively new and underexplored field' (Ament et al., 2015, p. 1) is surprising considering that standardization has the potential to reduce unwarranted frontline practice variation (Gawande, 2009; Timmermans, 2005).

Research on frontline professionals and standardization often adopts a micro-level 'autonomy perspective' that places the frontline professional's 'individualistic conception of autonomous . . . judgement' (Freidson, 1994, p. 196) front and centre (Light, 2010; Timmermans, 2005). This perspective informs our understanding of when and why frontline professionals resist standardization (Armstrong, 2002; Evetts, 2013; Ramirez, 2013; Wright, Zammuto, & Liesch, 2017). For example, researchers have argued that frontline professionals resist standardization because it inherently conflicts with their identity as individual autonomous actors (Freidson, 2001; McDonald et al., 2006) and limits their ability to provide individualized services ('a straight-jacketing effect on clinical practice', Parker & Lawton, 2000, p. 671). However, for at least two reasons, we believe that this perspective also renders research on frontline professionals and standardization incomplete.

First, a predominant focus on frontline professionals' resistance may only partially depict how frontline professionals actually engage with procedural standardization. The autonomy perspective fails to account for situations where frontline professionals *actively maintain standardization*, a problematic shortcoming, since this increasingly common and relevant phenomenon may not be reflected in current research (Ament et al., 2015; Noordegraaf, 2011). Second, if the conceptualization of frontline professionals is limited to individuals as autonomous decision-makers (e.g. Ramirez, 2013), researchers may overlook complementary – and even competing – motives and contingencies linked to frontline professionals' standardizing work. This oversight is problematic because it creates inconsistency between the standardization literature and recent research on frontline professionals' diverse motives (Heaphy, 2013; Wright et al., 2017) and situational influences on frontline work (Bechky, 2011; Smets, Morris, & Greenwood, 2012).

To address these problems, we introduce a 'coalface perspective' (Barley, 2017) to research on frontline professionals' standardizing work. A coalface perspective is a general theoretical perspective that – compared to the autonomy perspective – is better able to explain the reproduction of structures (e.g. maintenance of standardization) using the broad spectrum of everyday situations faced by actors (Bechky, 2011) and the field-, organizational- and task-level characteristics that shape these situations. Because it focuses our attention on situations (when do frontline professionals actively maintain standardization?), rationales (why do they actively maintain standardization?) and practices (how do they actively maintain standardization?), this perspective enables us to complement the established autonomy perspective, expand on it and contribute novel findings. To explore these aspects of frontline professionals' standardizing work, we use a two-phase, multimethod quantitative and qualitative approach with data from multiple sources.

We study the maintenance of care pathway enactment – a technique to standardize day-to-day medical work – in 19 medical-treatment procedures in 10 internal medicine departments of university hospitals – an influential medical setting that trains and socializes medical professionals. We find that three situations – comprising distinct combinations of field-level (i.e. public acclaim), organizational-level (i.e. professional expertise) and task-level (i.e. frequency and complexity) characteristics – stimulate physicians' perceptions of specific day-to-day problems (i.e. inconsistent professional socialization, sanctioning risks and lack of resources). Actively maintaining care pathways enables physicians to address each of these problems. We also find that physicians tend to use specific practices to actively maintain care pathway enactment in each situation.

We contribute to theory on frontline professionals (Reay, Goodrick, & Hinings, 2016) and professionals and standards (Evetts, 2013; Noordegraaf, 2011; Suddaby & Muzio, 2015) in three ways. First, by introducing a problem-driven coalface perspective on standards, our study offers a novel theoretical approach that is not available under the autonomy perspective (e.g. McDonald et al., 2006; Ramirez, 2013), allowing us to theorize more diverse – and thus, more realistic – motives linked to frontline professionals' work. Second, by accounting for the social embeddedness of frontline professionals, the coalface perspective contributes to reconciling divergent assessments within the literature on professionals of how they respond to societal demands (Evetts, 2013; Muzio, Brock, & Suddaby, 2013). Third, by describing how frontline professionals engage in standardizing work, we complement earlier studies describing the practices of resisting standardization (e.g. Allen, 2014; Currie & Spyridonidis, 2016). Taken together – and in line with recent work emphasizing the normative aspects of professionalism (e.g. Evetts, 2013; Muzio et al., 2013; Noordegraaf, 2011) – this study provides a counter-balance to traditional perspectives on professional autonomy and self-interest.

Theoretical Background

Standardization and professionals at the frontline

We define standardizing work as the active maintenance of formal standardization techniques that limit variance in frontline procedures. Standardization limits variance by reducing the range of stimuli, decision opportunities and behaviours available to an actor (Perrow, 1986). A prominent example of standardizing work in frontline medical work is physicians' maintenance of care pathways; that is, detailed written guidelines on how to treat a patient with a given diagnosis (Adler & Kwon, 2013). Research on standardization has a long tradition in organization theory (Brunsson & Jacobsson, 2002) and industrial sociology (e.g. Armstrong, Hyman, & Goodman, 1981; Blau, 1955; Zimmerman, 1970). These literatures have substantially advanced our understanding of how bureaucrats, workers and employees – actors who lack substantial individual autonomy – engage with standards. In contrast, research on frontline professionals is nascent (Reay et al., 2016), in particular with respect to standardizing work (e.g. Ament et al., 2015). This nascent research contrasts with a standardizing phenomenon that is increasingly common for frontline professionals.

Standardizing work plays a prominent but paradoxical role in the work of many frontline professionals (Evetts, 2013; Mannion & Exworthy, 2017). On the one hand, frontline professionals espouse standards issued by their own profession because unwanted variation in frontline performances may hamper outcome quality (Gawande, 2009; Timmermans, 2005). On the other hand, frontline professionals often resist implementing such standards in their day-to-day work, even if these standards are issued by their own profession: 'When professions formulate guidelines . . . their members look at guidelines more as options . . .' (Timmermans, 2005, p. 495). Examples of intra-professional resistance include frontline medical professionals resisting care pathways (Gabbay & le May, 2011; Mannion & Exworthy, 2017; Timmermans & Epstein, 2010), scientists resisting standards on data analysis (John, Loewenstein, & Prelec, 2012) and frontline accountants resisting rules-based accounting (Demski, 2002). These examples suggest that frontline professionals harbour 'a love-hate relationship toward standardization' (Timmermans, 2005, p. 491), with research focusing on the negative relationship.

Frontline professionals' resistance to standardization is well explained by a micro-level autonomy perspective on professionals (Armstrong, 2002; Freidson, 1994, 2001; Light, 2010; McDonald et al., 2006). Because it focuses on the individual autonomy of frontline professionals, this perspective is distinct from more macro-level perspectives on professions – for example, the 'power

perspective' (Johnson, 1972). In general, actors resist standardization because 'conforming to standards means following the advice of others, relinquishing a certain degree of one's freedom of choice and self-control to others . . . none of which is very consistent with the concept of an actor' (Brunsson & Jacobsson, 2002, p. 134). This seems particularly true when conceptualizing frontline professionals as individual autonomous decision-makers (Freidson, 2001; Light, 2010). Any procedural standardization inherently threatens both individual decision-making autonomy and the ability to provide individualized services (Timmermans & Epstein, 2010). When conceptualizing frontline professionals as 'sole decision maker[s]' (Timmermans, 2008, p. 18), resistance to standardization becomes the salient behavioural response. In line with this notion, 'sociological studies of pathways often find professional resistance to standardisation' (Martin, Kocman, Stephens, Peden, & Pearse, 2017, p. 1314). While the autonomy perspective provides a powerful explanation for why frontline professionals resist standardization, it fails to acknowledge that frontline professionals sometimes *actively maintain* standardization (e.g. Ament et al., 2015).

Overall, standardizing work by frontline professionals remains a relevant but largely understudied phenomenon (Ament et al., 2015; Evetts, 2013; Martin, Kocman, et al., 2017). Without taking into account that professionals may have other, more diverse motives in addition to individual autonomy (Heaphy, 2013; Wright et al., 2017) and without recognizing the varied situations that frontline professionals face (Bechky, 2011; Smets et al., 2012), we may fail to understand why frontline professionals sometimes actively maintain standardization – and in doing so, give up individual autonomy. This omission renders current theory on professionals incomplete. The coalface perspective we introduce next provides a foundation to address this shortcoming.

A coalface perspective on standardizing work

We adopted the nascent coalface perspective because it mirrors our research interest in individuals' active maintenance of standards and other social structures (Barley, 2017; Smets, Aristidou, & Whittington, 2017). To explain when and why actors actively engage in standardizing work, the coalface perspective focuses on the day-to-day situations and problems that actors face (Bechky, 2011; Currie & Spyridonidis, 2016; Smets et al., 2012). This perspective emphasizes that social structures – such as standards – are 'situated, interpreted, and reinforced locally' (Dacin, Munir, & Tracey, 2010, p. 1394). A strength of this perspective, compared to the autonomy perspective, is that it allows us to focus on the situational demands faced by actors – instead of their identity – and explore frontline professionals' standardizing work as a response to day-to-day work situations shaped by the field, organizational and task level. By accounting for the multilevel nature of situations (Martin, Currie, Weaver, Finn, & McDonald, 2017), the coalface perspective is a promising complement to the autonomy perspective.

In addition to explaining *when* and *why* actors maintain standards, the coalface perspective also covers *how* – that is, through which practices (e.g. monitoring the behaviour of colleagues) – actors maintain standards (e.g. Dacin et al., 2010). Maintenance practices matter, because day-to-day entropy constantly threatens the reproduction of standards and other social structures (Barley, 2017). For example, coalface research demonstrates that practice disruptions (Dacin et al., 2010; Lok & De Rond, 2013), changes in personnel (Faraj & Xiao, 2006) and breaches of institutionalized beliefs (Heaphy, 2013) hamper reproduction. Given that frontline professionals face high levels of day-to-day entropy threatening the reproduction of standards (Bruns, 2009; Gabbay & le May, 2011), uncovering such practices allows us to expand our understanding of how frontline professionals do standardizing work, specifically what practices are needed to maintain standardization in the face of entropy.

While research adopting a coalface perspective remains rare (Barley, 2017), the little conceptual work that does exist urges researchers to focus their attention on the links between situations ('when'), rationales ('why') and practices ('how') of maintenance work (e.g. Smets et al., 2017). A coalface perspective on frontline medical professionals' standardizing work thus needs to address these three questions. We address these questions in the context of medical professionals' maintenance of care pathway enactment in university hospitals, an exemplary case of standardizing work by frontline professionals.

Research Setting: Maintenance of Care Pathway Enactment as Standardizing Work by Frontline Medical Professionals

The maintenance of care pathway enactment represents an exemplary case of frontline professionals' standardizing work because it effectively limits the number of medical treatment options available to individual medical professionals in their day-to-day patient care (Adler & Kwon, 2013). In enacting care pathways, physicians follow strict procedural rules that usually cover treatment practices, medication, actors involved and time frames for patients with a specific clinical problem (Timmermans & Berg, 2003). Upon completion of each activity, medical professionals fill out a corresponding checklist (Campbell, Hotchkiss, Bradshaw, & Porteous, 1998). Care pathways cover a broad spectrum of clinical situations, ranging from treating strokes (Kwan & Sandercock, 2005), to gastrointestinal haemorrhage (Podila et al., 2001) to death (Veerbeek et al., 2008). Figure 1 provides an illustrative example of a pathway used by frontline physicians to treat cardiogenic shock.

Care pathways emerged in the 1970s and subsequently spread from the United States across the globe (Weisz et al., 2007). Today, care pathways are common in many hospitals, and some physicians actively maintain this standardization technique (Ament et al., 2015). Care pathways are usually developed by medical professionals, published in the medical literature (e.g. Kwan & Sandercock, 2005), adopted by hospital departments (Adler & Kwon, 2013) and signed off by the department head physician (for additional information on the development and adoption of care pathways, see Adler & Kwon, 2013; Timmermans & Berg, 2003). Similar to procedural standards in other settings (Blau, 1955), the adoption of a care pathway by a hospital department usually involves minor modifications to fit local circumstances. Medical professionals usually publish care pathways to improve patient safety (Timmermans, 2005). However, evidence on the effectiveness of care pathways remains mixed at best (Chan & Webster, 2013; Chen, Chen, Liu, Tzeng, & Glasziou, 2014; Ciapponi et al., 2017; Rotter et al., 2008). Thus, clinical effectiveness does not fully explain why medical professionals actively maintain care pathway enactment. This suggests that frontline physicians have various motives for actively maintaining them, rendering the maintenance of care pathway enactment an ideal phenomenon to explore frontline professionals' standardizing work.

To study the maintenance of care pathway enactment in medical practice, we selected cases using a theoretical sampling procedure (Eisenhardt, 1989). We found that internal medicine departments in university hospitals in Germany offer theoretically relevant cases for three reasons: first, past research suggests that medical professionals working in university hospitals in Germany *do* persistently enact care pathways (Vanhaecht et al., 2006). Second, university hospitals train and socialize future members of the medical profession (ÄApprO, 2002), thus providing a setting where standardization and clinical autonomy coalesce. Third, German university hospitals – while subject to market, public and legislative pressures – are usually owned by the public, are legitimized through their academic function (Bär, 2011) and benefit from their high-yielding patients

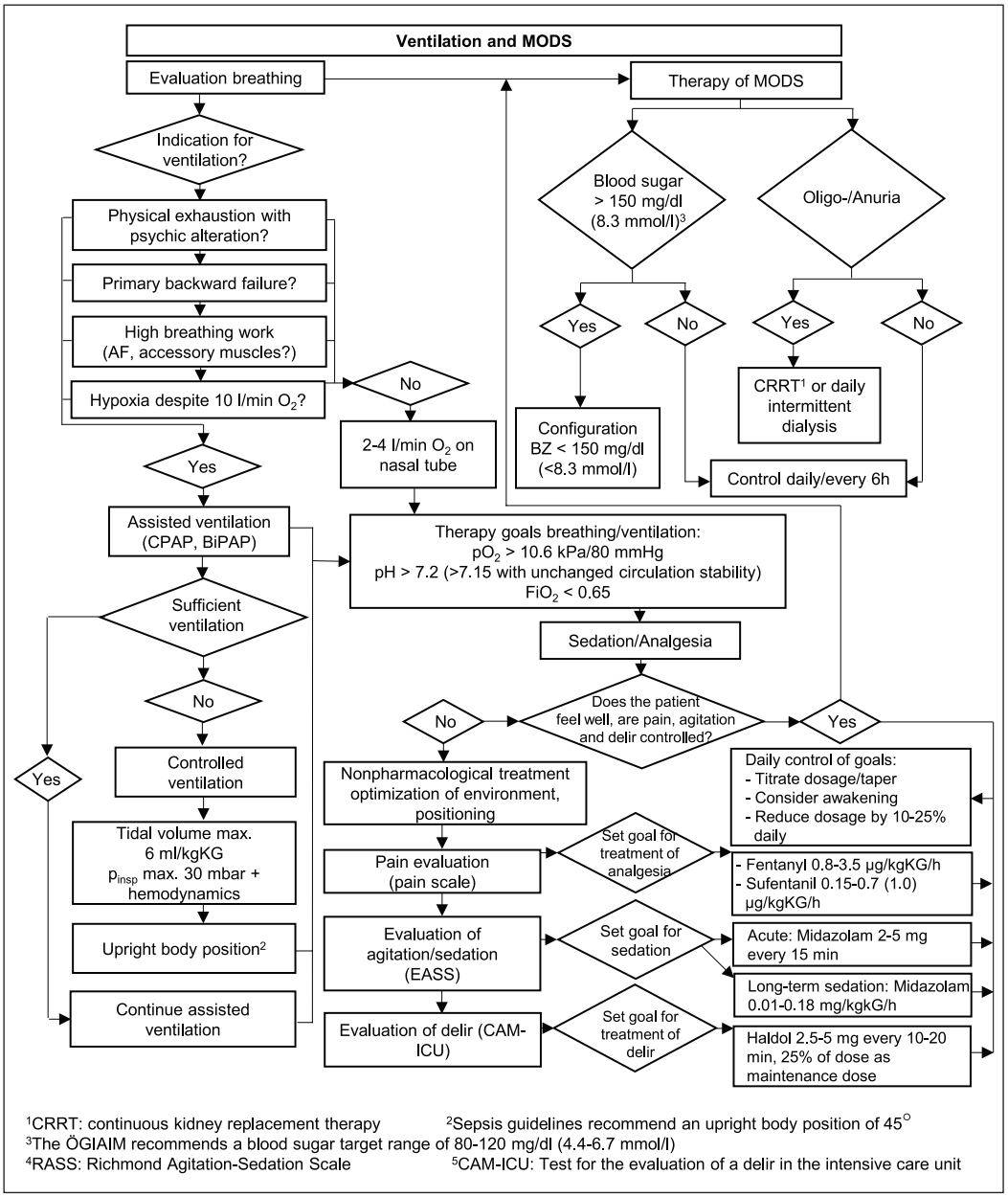

Figure 1. Care pathway for cardiogenic shock treatment (excerpt).

Note: While we are prevented from printing the original document used by the internal medicine department due to anonymity concerns and copyright restrictions, the guideline printed here is similar to the corresponding care pathway used for this disease in this department. This figure was translated (by permission) from Springer Nature: Springer Medizin, Der Kardiologe, (Deutsch-österreichische S3-Leitlinie infarktbedingter kardiogener Schock. Diagnose, Monitoring und Therapie, Werdan et al.), Copyright 2011.

(Augurzky, Krolop, Hentschker, Pilny, & Schmidt, 2014, p. 28). University hospitals thus represent a setting where persistent care pathway enactment predominantly results from professional

rationales. We decided to focus on internal medicine departments in German university hospitals because these departments are structurally similar across hospitals (e.g. treatments provided) but exhibit considerable variance within each department (e.g. frequency and complexity of treatments), thus increasing the likelihood of uncovering a broad spectrum of situations associated with the maintenance of care pathway enactment.

Explanatory conditions: Situational characteristics related to care pathway enactment

Coalface-perspective research centres on the situations actors face. Therefore, we reviewed prior research on care pathways (e.g. Adler & Kwon, 2013) and, more generally, persistent enactment of techniques in professional settings (e.g. Ferlie, Fitzgerald, Wood, & Hawkins, 2005; Zeitz, Mittal, & McAulay, 1999) to identify which situational characteristics affect whether care pathways are maintained. This review revealed particularly prominent situational characteristics that may affect the maintenance of care pathway enactment: public acclaim (on the field level), professional expertise (on the organizational level) and treatment complexity and frequency (on the task level).

First, different care pathways have different levels of *public acclaim*, which may affect day-to-day maintenance. Public acclaim here means the level of public acceptance and is achieved through publication of supportive case-based demonstrations. Professionals might maintain the enactment of a care pathway because enacting one that is backed by supportive case reports indicates professionals' 'conformity to a specific standard' (Ruef & Scott, 1998, p. 880). Furthermore, maintaining the enactment of publicly acclaimed care pathways aligns well with professionals' interests in transparency and accountability (Evetts, 2013; Svensson, 2010), which manifests in the social expectation that professionals conduct evidence-based medicine (Currie & Harvey, 2000), thereby securing their legitimacy as medical professionals (Thomas, Walker, & Zelditch, 1986).

An organizational-level situational characteristic affecting care pathway enactment is the collective level of *professional expertise* in a department. Experienced medical professionals have gained expertise, developed a fuller repertoire of treatment alternatives, harbour a broader basis for evaluating and accounting for the appropriateness of their treatments and coordinate more effectively (Xu, Carty, Orgill, Lipsitz, & Duclos, 2013). We therefore expect senior medical professionals to be less dependent on care pathways, while junior medical professionals – in contrast – usually lack this expertise and could benefit from guidance in the form of care pathways (Faraj & Xiao, 2006; Rycroft-Malone, Fontenla, Bick, & Seers, 2008). Thus, we expect maintenance of care pathway enactment to be common in departments that predominantly employ junior physicians.

Finally, *treatment complexity* and *frequency* are task-level contingencies that may affect the maintenance of care pathway enactment. Across different organization theories, complexity and frequency are important task characteristics associated with standardization (e.g. Jones, Hesterly, & Borgatti, 1997). Non-complex but frequent treatments might benefit from the standardization advantages of care pathways (Hansen, Nohria, & Tierney, 1999), enabling medical professionals to economize on scarce resources (Bohmer, 2009). However, research also suggests that maintaining standardization supports complex but infrequent treatments (March, Sproull, & Tamuz, 1991; Zollo & Winter, 2002): Professionals may easily lose sight of the different treatment elements and interdependencies (Becker, 2005), and infrequent treatments means learning opportunities are rare. In these situations, maintenance of care pathway enactment ensures that professionals keep 'on track' (March et al., 1991). At the same time, maintaining standardization becomes cumbersome with increasing task complexity (Galbraith, 1973; Van de Ven, Delbecq, & Koenig, 1976). Overall, this suggests that treatment frequency and complexity contribute to a complex configurational pattern affecting the maintenance of care pathway enactment by medical professionals.

In sum, field-level (i.e. public acclaim), organizational-level (i.e. professional expertise) and task-level (i.e. treatment frequency and complexity) situational characteristics may help explain when frontline medical professionals maintain care pathway enactment.

Methodological Approach, Data and Empirical Analysis

To explore medical professionals' maintenance of care pathway enactment in university hospitals, the coalface perspective suggests that we first needed to identify in which situations ('when') medical professionals enact care pathways and, second, to uncover associated rationales ('why') and practices ('how'). In focusing on these questions, and explicitly accounting for the multilevel nature of situations as elaborated above, our study strictly follows conceptual coalface perspective work (Barley, 2017; Bechky, 2011). We used a two-phase multimethod analytical strategy because analytical approaches to systematically identify situations that drive a specific outcome across several cases provide little insight into underlying rationales and practices (Cresswell, 2003, p. 211). In analysis phase I, detailed in the next section, we used fuzzy-set qualitative comparative analysis (fsQCA) (Ragin, 2008) to analyse quantitative archival and interview data and identify when medical professionals maintain care pathway enactment. The findings of analysis phase I – specific situations driving the maintenance of care pathway enactment – are further fleshed out in analysis phase II, where we qualitatively analysed (Gioia, Corley, & Hamilton, 2013; Miles & Huberman, 1994) additional field data (80 hours of non-participant observation and 8 semi-structured interviews) to explore why and how medical professionals engage in standardizing work. Our two-phase research strategy benefits from the methodological strengths of analysis phase I (systematic cross-case comparison) and analysis phase II (in-depth qualitative analysis), allowing us to both identify relevant situations resulting in standardizing work while also helping us to understand corresponding rationales and practices.

Analysis phase I: When do medical professionals maintain care pathway enactment?

Sampling. Analysis phase I sought to identify when medical professionals engage in standardizing work in day-to-day patient treatment; that is, situations in which physicians persistently enact care pathways. To identify these situations, we approached the nursing directors of all 32 German university hospitals to ask for access to their internal medicine departments. Sixteen hospitals agreed, and we then arranged interviews with physicians, nurses and case managers to learn about care pathway enactment in their departments. We conducted 48 semi-structured interviews in total, including 26 with healthcare professionals from internal medicine departments, as well as 22 background interviews with nursing directors and hospital quality-of-care managers for cross-validation purposes. Table 1 provides an overview of the interviews at departments with any experience in care pathway enactment.

To ensure consistency, we used an interview guideline, with questions on care pathway enactment ranging from very broad to very specific (e.g. 'Which diagnoses/procedures in the interviewee's department are practised on the basis of care pathways?', 'Which care pathways do practitioners regularly and substantially deviate from?'). We ensured that our interviewees expounded freely on what they felt to be important regarding care pathway enactment. The interviews were conducted in German – the native language of the interviewers and all interviewees. With the exception of brief conversations, which we documented with written notes, all interviews were recorded digitally and transcribed for further analysis (Bryman, 2008).

Table 1. Overview of interview data.

University hospital	Interview partners	Interview duration [hours, Ø]
I	4 (JP, RN*, QoC, ND)	1 ¼
II	6 (SP, 2 x HN, CM, QoC, ND)	1
III	4 (SP, HN, RN, ND)	¾
IV	2 (HN, ND)	¾
V	5 (SP, JP, 2 x HN, ND)	1
VI	3 (SP, HN, QoC)	1
VII	3 (JP, HN, ND)	¾

CM = case manager; HN = head nurse; JP = junior physician; ND = nursing director; QoC = quality-of-care manager; RN = registered nurse; SP = senior physician; (*) interviewee worked in multiple departments.

We took several precautions to gain a balanced and authentic perspective on care pathway enactment: to avoid social-desirability response bias, we assured all interviewees of their complete anonymity. Participation in our interviews was voluntary. Wherever possible, we interviewed at least two people – including at least one of each healthcare profession (e.g. doctors and nurses) – per department to ensure reliable statements (Eisenhardt & Graebner, 2007). In a few cases, we were also granted access to the case managers of the respective departments. We observed no fundamental disagreement among interviewees from the same department on whether care pathways were maintained (or not) and which care pathways were maintained (or not). Given that our interviews also documented instances where care pathway enactment was not maintained (see Table 3), we have confidence in the validity of our data collection method.[1] These interviews served to build 19 cases of care pathway enactment in 10 internal medicine departments across seven university hospitals.

Analytical approach: Fuzzy-set qualitative comparative analysis. We used fsQCA to uncover when care pathway enactment was maintained by medical professionals across these 19 cases. FsQCA supports researchers in analysing complex configurational relationships between explanatory conditions (i.e. 'situations') and an outcome (i.e. 'care pathway enactment') across cases in a reliable and reproducible way. To identify such relationships, fsQCA uses Boolean logic to identify commonalities and differences across cases with the same outcome (Ragin, 2008). This analysis method is accepted, systematic and transparent (Ragin, 2008; for an introduction see Fiss, Cambré, & Marx, 2013), and is one that is becoming increasingly popular in organization research (e.g. Vergne & Depeyre, 2016).

FsQCA is particularly appropriate for uncovering situations associated with the maintenance of care pathway enactment. First, this method is commonly used for case analysis, in particular 'where single conditions do not display their effect on their own, but only together with other conditions' (Schneider & Wagemann, 2012, p. 6). While theory on situations that drive frontline professionals' standardizing work is absent, in an earlier step (described in the previous section) we analysed literature that identifies isolated situational characteristics that may affect this outcome. Second, the maintenance of care pathway enactment may equally result from different (configurations of) situational characteristics, thus suggesting equifinality (i.e. the same outcome via different paths). FsQCA, in contrast to regression analysis, allows equifinal explanations because this method does not assume that there is only one constellation of features among all observed cases that causes the outcome (Ragin, 2008). Finally, because all findings obtained from fsQCA are

represented by sampled cases, fsQCA findings are more conservative than regression-based results (Vergne & Depeyre, 2016).

Measures and calibration. We used archival data to measure each situational characteristic. The outcome – maintenance of care pathway enactment – was measured by coding our analysis phase I interview data. Table 2 describes the operationalization of the situational characteristics and the outcome. To capture meaningful differences in kind and degree between cases, fsQCA requires all measures to be calibrated (Ragin, 2008). Table 2 also describes our calibration rationales.

Table 3 depicts the raw data collected for each of our empirical cases.

Data analysis. To uncover when medical professionals maintain care pathway enactment, we analysed our data using the standard software package fsQCA version 2.5 (Ragin & Davey, 2009).[2] Table 4 presents the results of this analysis using the established notation style suggested by Ragin and Fiss (2008). Black circles indicate the presence of a situational characteristic, while crossed circles indicate the absence of a situational characteristic. Blank spaces indicate a 'don't care' situation in which the situational characteristic may be either absent or present. We find three situations (i.e. configurations of situational characteristics) explaining when medical professionals maintain care pathway enactment. In our findings section, we first interpret these findings in isolation, then complement and expand our interpretations using the findings of analysis phase II.

Table 4 also provides two key metrics on the validity of our analysis (for detailed information, see Ragin, 2006): consistency and coverage, both of which range from zero to one. Consistency measures the internal validity of our findings (i.e. the degree to which cases with a high membership in one situation exhibit similar characteristics). The overall solution consistency (0.94) and individual solution consistency terms (0.99, 0.95 and 0.91) are well above the minimum consistency (0.80) recommended by Ragin (2008). These values indicate that an appropriate correspondence exists between the situations identified as drivers of care pathway enactment and our empirical cases. The relevance of the different situations is expressed by the coverage scores, which are calculated from the percentage of cases that represent a given solution term within the outcome (Ragin, 2006). As indicated by the solution coverage, all three solutions together account for approximately 71 per cent of the variance in the outcome. This result demonstrates that our selection of explanatory conditions was appropriate to account for a broad spectrum of different situations resulting in the maintenance of care pathway enactment.

While analysis phase I uncovered when medical professionals maintain care pathway enactment, these findings provide little insight into why and how they do so. To find these answers, we conducted analysis phase II using qualitative analysis based on non-participatory observational data of physician frontline work and additional interviews.

Analysis phase II: How and why do medical professionals maintain care pathway enactment?

To explore possible interpretations and implications of our analysis phase I findings, we first conducted eight qualitative interviews with medical professionals who were not interviewed in analysis phase I. These interviews with three senior and five junior physicians from two university hospitals always followed the same structure: initially, we asked interviewees to freely narrate their personal experiences with care pathway enactment to help us understand their perspectives. At this stage, we did not share or reveal any of our findings from our analysis phase I. Then, after our interviewees had shared their experiences, we conducted 'member-checks' (Harvey, 2011, pp. 438–439) and discussed our analysis phase I findings with them. We asked

Table 2. Measurement and calibration of raw data.

Variable	Measurement	Calibration
Outcome		
Care pathway enactment	We coded phase I interview data (see Table 1) to determine whether care pathways had become an element of daily practice for a specific treatment in the respective department. Based on the interview data, we derived a list of departments and treatments for which care pathways had been implemented and noted whether or not medical professionals enacted the care pathway in the respective treatment.	Set-membership values were assigned to outcomes based on a simple logic: all treatments in a department exhibiting care pathway enactment were assigned set-membership values of one, whereas treatments exhibiting no care pathway enactment were assigned set-membership values of zero.
Situational characteristics		
Public acclaim	We used the number of citations of the most-frequently cited scientific article describing a model care pathway applicable to the respective treatment. Our search for scientific publications was conducted via MedLine (2012) using an array of search terms.[3] The more widely disseminated an article that describes and tests a specific care pathway in the professional community, the higher the public acclaim of a care pathway. Random samples of the cited articles were inspected to ensure that findings were largely in favour of the respective care pathway. Usually these studies were illustrative case studies and not randomized controlled trial studies. In consequence, these studies cannot test the causal effectiveness of care pathway enactment on economic and/or patient outcomes (Rotter et al., 2008).	The full membership threshold and the crossover point were derived by conducting an additional MedLine search on care pathways limited to the respective specialty area (e.g. nephrology). We analysed the search results for the most-cited article published in the respective treatment area. Given our theoretical assumptions on public acclaim, this number indicates full set membership for a specific department type. In line with this rationale, we set the threshold for full non-membership in the set to 0.5 citations.[4] The crossover point was derived by inspecting the distribution of the MedLine citation records for a value break among the citation clusters (Crilly, Zollo, & Hansen, 2012).
Professional expertise	We used the ratio of specialist doctors ('Fachärzte') to all other clinicians within the department in question to measure professional expertise.[5] Specialists have mastered the highest level of medical training available, having undergone five to seven additional years of practical training, and are therefore highly experienced in performing medical treatments (Egan & Jaye, 2009). Thus, we assume that the ratio of specialists to all other clinicians within a department validly captures the average level of professional expertise present in a department.	We calibrated the set *high professional expertise* using our basic population. More specifically, we calculated our measure for actors' professional expertise (specialist/non-specialist) for all internal medicine departments in the sample (e.g. nephrology) across all university hospitals in Germany.

(continued)

Table 2. (continued)

Variable	Measurement	Calibration
Task complexity	Task complexity was calculated using the average complexity of the medical cases subject to the respective treatment. We collected this information from the G-DRG (German Diagnosis Related Groups) weights that are typically assigned to each treatment. These cost weights indicate the relative complexity of a certain diagnosis-related group and are updated annually to provide the basis for health insurance providers' reimbursement rates for clinical treatments. The weights are determined by InEK, a public organization set up by the German government (Schreyögg, Tiemann, & Busse, 2006, p. 272). As a first step, we matched the medical procedures constituting the respective treatment with the related G-DRG codes and validated these matches using expert ratings provided by the head of the accounting department of one of the largest German hospitals. In a second step, we weighted the respective G-DRG weights according to their relative occurrence in the German hospital field to account for the patient composition receiving the respective treatment. We then calculated the average weight of the respective G-DRG codes per treatment. These values constitute our data on task complexity. We decided to use G-DRG weights as a measure because G-DRGs are by law designed to capture treatment complexity (KHEntG § 9 Abs. 1).	Calibration of the set *high task complexity* was based on the German hospital reimbursement system. This system assigns the DRG value one to treatments of average complexity (InEK, 2012). Accordingly, a measured treatment complexity of one provides a highly appropriate qualitative anchor for the set's crossover point. Lacking theoretical criteria indicating threshold values for full membership and full non-membership, we decided to derive these anchors by inspecting the distribution of the average DRG values reported by all German hospitals for obvious value breaks (Crilly et al., 2012).
Task frequency	The frequency of a task was measured by the number of respective treatments performed by the hospital department during 2012.	The set *high task frequency* was calibrated using basic population information. Again, we relied on the official quality reports of all German university hospitals. Based on this information, we first gathered data on the number of treatments (e.g. renal biopsy) in the respective departments per report year. To derive threshold values for full membership, full non-membership and the crossover point, we inspected these distributions for value breaks (Crilly et al., 2012).

Table 3. Cases and raw data.

Case ID	University hospital	Internal medicine department	Treatment
1	I	Nephrology	Renal transplant evaluation
2			Renal dialysis
3		Cardiology	Cardioversion
4	II	Nephrology	Renal transplant evaluation
5			Renal puncture
6			Shunt
7		Cardiology	Angiography
8	III	Oncology	Plasmacytoma
9	IV	Cardiology	Angina pectoris
10	V	Nephrology	Arterial hypertension
11			Renal biopsy
12			Renal insufficiency
13	VI	Oncology	Bone marrow transplantation
14		Nephrology	Arterial hypertension
15			Renal biopsy
16	VII	Gastroenterology	Peritoneal puncture
17			Pleural punctuation
18			Trans-arterial chemo embolization
19			Mini-laparoscopy

Cases and raw data.

Case ID	Public acclaim	Professional expertise	Task complexity	Task frequency	Care pathway
1	13	1.25	2.27	10	Enacted
2	11	1.25	1.35	8900	Enacted
3	0	1.21	0.49	164	Enacted
4	13	0.50	2.27	16	Enacted
5	0	0.50	0.91	1	Non-enacted
6	0	0.50	0.95	85	Enacted
7	1	0.50	0.92	6307	Enacted
8	0	0.63	1.09	228	Non-enacted
9	76	1.01	0.55	623	Enacted
10	2	0.56	0.53	83	Enacted
11	1	0.56	0.91	218	Enacted
12	11	0.56	1.35	242	Enacted
13	7	1.25	15.70	216	Enacted
14	2	0.86	0.53	56	Non-enacted
15	1	0.86	0.91	155	Enacted
16	0	0.64	0.76	610	Enacted
17	0	0.64	0.67	101	Enacted
18	11	0.64	1.11	81	Enacted
19	6	0.64	1.06	366	Enacted

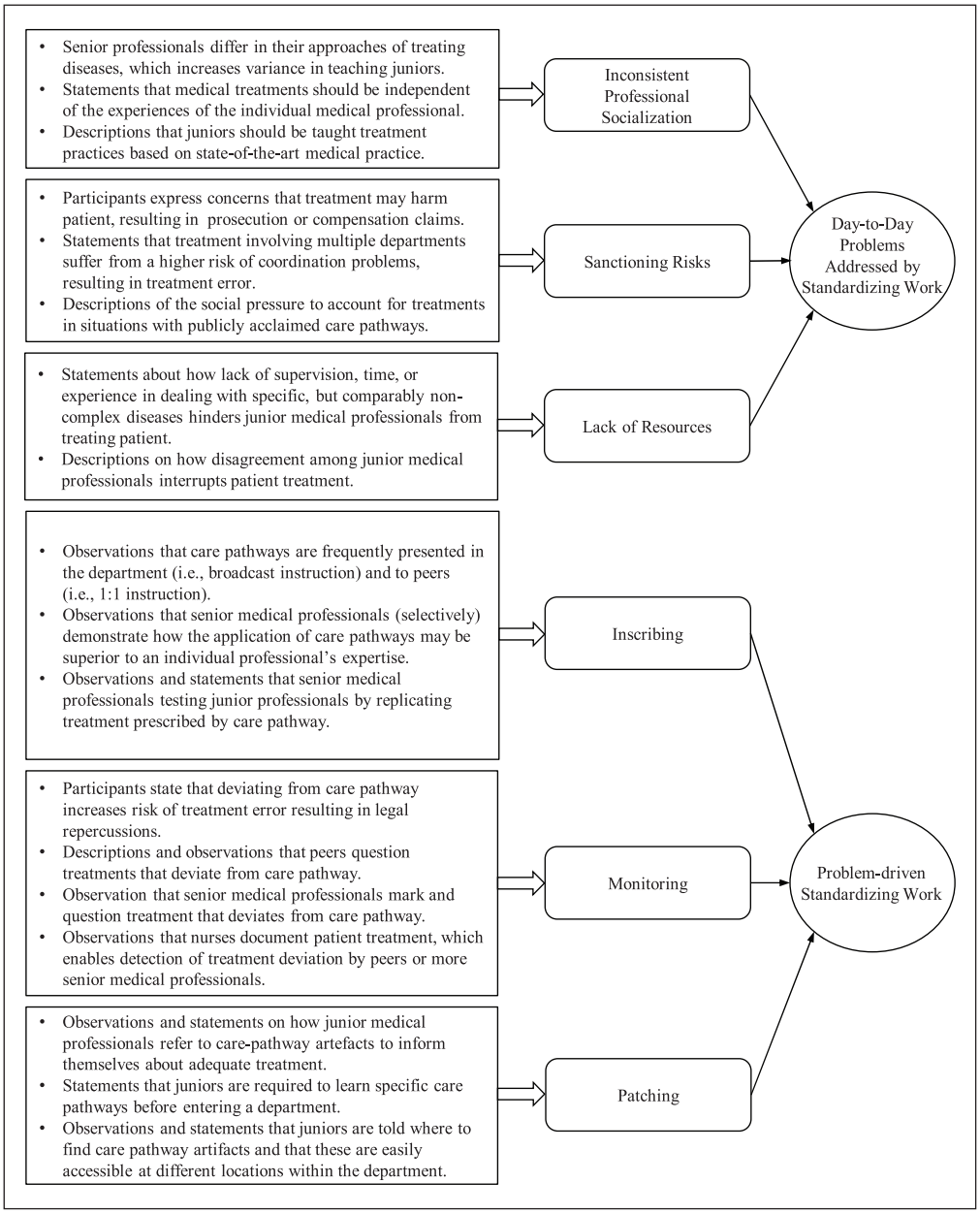

Figure 2. Qualitative data structure.

them to interpret and question these findings and to illustrate their interpretations by providing examples from their own experiences as frontline professionals. We then summarized our evolving, tentative interpretations and asked the interviewees to challenge these interpretations. We digitally recorded each interview. While these interviews were helpful to gain initial insights into rationales and practices governing each situation identified in analysis phase I, we needed

additional field data on the maintenance of care pathway enactment in patient treatment to answer the 'why' and 'how' questions.

To gather this data, one author spent approximately 80 hours as a non-participant observer[6] in internal medicine departments exhibiting different levels of the situational characteristics (i.e. public acclaim of the care pathways enacted, professional expertise within the department, treatment frequency and treatment complexity), thus allowing us to complement our analysis phase I findings. She participated in morning rounds, attended meetings and shadowed both senior (three individuals) and junior (eight individuals) medical professionals during patient treatment. Attending day, late and night shifts allowed her to quickly build trust with the medical staff. She also had lunch and conversations during breaks to get a sense of how medical professionals maintain care pathway enactment. Field notes were taken in a notebook and as an audio memorandum that was subsequently transcribed. These field notes contain primary data (e.g. disease of a patient, medical professionals involved in treating disease, whether care pathways were enacted in treating the patient) and secondary observations (e.g. patterns in communication style), as well as contextual data (Charmaz, 2014). Overall, field notes and interview transcripts from analysis phase II accumulated to 234 pages of additional qualitative data containing empirical details and dialogue reflection. These data were uploaded to MAXQDA 11.1.2 for analysis.

We analysed this data by categorizing and sorting it (Miles & Huberman, 1994) to gain a deeper understanding of why medical professionals engage in standardizing their work using care pathways and to identify specific practices. Initially, two authors coded each analysis phase II document independently and then shared and compared the coded documents with each other to discuss different interpretations. We iterated between predefined categories (e.g. whether the observed individual was a junior or senior medical professional) and themes that emerged from these qualitative data (Miles & Huberman, 1994). In line with our two-phase research strategy (Cresswell, 2003, p. 211), we also incorporated our analysis phase I findings to categorize situations. This was possible because analysis phase II covered situations that reflected the configurations of explanatory conditions found in analysis phase I. This initial, first-order coding process resulted in 51 categories and 195 codes assigned to data. We then abstracted from the first-order coding and looked for relationships between codes and conceptual interpretations. Incorporating feedback from medical professionals, fellow researchers and reviewers, some of our abstractions and interpretations evolved, while others were corroborated. For example, early in the process we understood that day-to-day problems might drive care pathway enactment, yet our understanding of how these problems relate to maintenance practices emerged later. This procedure helped us to identify problems and practices that frontline physicians associated with (or enacted in) these situations. While frontline physicians may also associate these problems and practices with other situations, our data suggest that specific problems and practices are particularly relevant to frontline physicians in specific situations. Figure 2 documents the final data structure that resulted from our analysis phase II (Gioia et al., 2013). The next section presents our findings.

Findings

In combining the findings of analysis phases I and II, a detailed account emerged of when, why and how medical professionals engage in standardizing work. We found that physicians actively maintained care pathway enactment in three distinct situations. Uncovering why and how care pathways were maintained in these situations, we found that some problems and practices were more pressing for physicians. Maintaining care pathways enabled physicians to address these problems; because each situation presents specific challenges, physicians respond by maintaining care pathways using specific maintenance practices. We do not claim that these problems and

Table 4. Situations driving care pathway enactment.

Situational characteristic	Situation		
	1 (Inconsistent professional socialization)	2 (Sanctioning risks)	3 (Lack of resources)
High public acclaim	●	●	⊗
High professional expertise	●		⊗
High task complexity		●	⊗
High task frequency	●		●
Consistency	.95	.99	.91
Raw coverage	.17	.35	.40
Unique coverage	.05	.18	.31
Cases covered	2, 9, 13	1, 2, 4, 12, 13, 18, 19	6, 7, 10, 11, 15, 16, 17
Overall solution consistency		**.94**	
Overall solution coverage		**.71**	

Note: ● = situational characteristic present; ⊗ = situational characteristic absent; blank spaces indicate that the situational characteristic may be either absent or present.

practices were absent in other situations, but rather that they were more present in the respective situation.

Figure 3 provides an overview of our findings. It shows that the nature of the perceived problem links situations (when), rationales (why) and specific practices (how) that maintain standardization.

Situation 1: Inscribing to overcome inconsistent professional socialization

Analysis phase I (Table 4, situation 1) suggests that medical professionals maintain care pathway enactment when there is a combination of substantial public acclaim for the care pathway (e.g. several case reports documenting the enactment of this care pathway in other hospitals), a department employs a high ratio of medical professionals with expertise and a respective treatment is executed frequently (e.g. medical professionals treat angina pectoris several times per day). This result only partially reflects our initial theorizing. We expected that frontline professionals would maintain care pathways with public acclaim – because doing so supports frontline professionals in addressing demands for transparency and accountability (Evetts, 2013; Svensson, 2010) – and we also expected that frequent treatments would be subject to standardizing work – because it enables economizing on scarce resources (Hansen et al., 1999). However, we were surprised that departments with a high ratio of medical professionals with expertise maintained care pathways for such treatments, since our theory suggested that departments with a high ratio of medical professionals with expertise – indicating no lack of personnel resources that would require economizing – would provide personal guidance to junior professionals.

Therefore, while analysis phase I (situation 1) revealed when medical professionals enact care pathways, only our complementary analysis phase II revealed the day-to-day problem (why) that medical professionals commonly perceived in situation 1 and that they addressed by their standardizing work (how): inconsistent professional socialization.

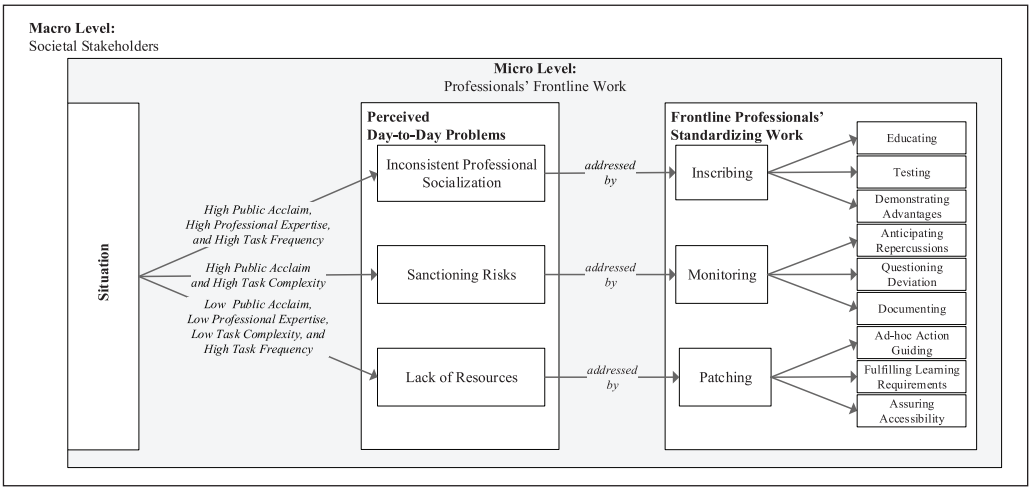

Figure 3. Frontline professionals' standardizing work as day-to-day problem solving.

Problem: Inconsistent professional socialization. As the primary site of professional socialization, university hospitals play a core role in educating junior physicians, and for the senior medical professionals in the departments we studied, this is a key activity. Across our observations and interviews, we noticed that senior physicians put great emphasis on, and took responsibility for, educating and socializing junior colleagues using hands-on medical training. As departments covered by situation 1 exhibit a high senior-to-junior training ratio, many senior physicians in these departments teach junior physicians (field notes, pp. 18, 59). Several physicians stated that seniority, and thus professional expertise, results in a broader variation of treatment approaches provided within a department. For instance, one senior physician reported: 'I would approach this [a patient with a disease] in a more differentiated way than a junior physician . . . due to my experience' (senior physician I6). A junior physician corroborated this assessment by stating '. . . that is something you notice: senior physicians – due to their personal experience – deviate from common patterns more frequently than the younger, less experienced ones' (junior physician I5).

Medical professionals in these departments – because of their high average levels of expertise – are aware of their duty to consistently socialize junior medical professionals in state-of-the-art medical practice, in particular when these treatments have care pathways with public acclaim: 'There is peer pressure to do it right . . . that you don't go your personal *Sonderweg* [i.e. idiosyncratic approach] [resulting] from the institutional pressure [to teach state-of-the-art medical practice]' (senior physician I3). When treatments are frequent in a department, the cumulative effect of applying different treatment approaches results in a day-to-day problem of consistently teaching junior physicians state-of-the-art medical practice (field notes, pp. 18, 59). This inconsistency is problematic because it hampers junior physicians' learning. To pragmatically solve this problem, the medical professionals we studied engaged in standardizing work using three distinct practices that answer the question of how care pathways are used: educating, testing and demonstrating the advantages of enacting care pathways.

Practice: Educating. To ensure that all medical professionals within the department knew about care pathways enacted in their department, several forms of educating senior peers and juniors were employed. The most common forms were 'updates' for fellow department members (field notes,

pp. 13, 72–73; junior physician I1) and regular presentations in department meetings (e.g. junior physician I1; senior physician I7). In addition to such 'broadcast instruction', we noted instances where experienced peers provided one-on-one instruction between each other, such as when care pathways had been modified (senior physician I7). Such educative practices served to assure that both senior and junior professionals within the department were aware of the state-of-the-art treatment documented in the care pathway and to ensure 'continuity' (senior physician I7) in their enactment.

Practice: Testing. Care pathway enactment was also maintained by testing junior physicians' care pathway knowledge. While junior physicians were not sanctioned for *not* enacting care pathways, they were trained by senior physicians to understand that care pathway enactment represented 'ideal treatment' for a given diagnosis (field notes, p. 20). To conduct this training, senior physicians frequently discussed patient cases with junior physicians and challenged them to generate treatment options and contingencies for specific conditions, a common approach in university hospitals. In private conversations, however, junior physicians explained to us that referring to the care pathway usually provides a safe answer to these 'testing questions', as it limits embarrassment ('This keeps you from dropping the ball' [field notes, p. 110]) and allows one to demonstrate, 'Okay, I know the ropes in this department, I know what the standard [for a specific treatment] is and thus can provide an adequate treatment' (field notes, p. 110).

Practice: Demonstrating advantages. The final practice in situation 1 for maintaining care pathway enactment (and thereby addressing the perceived problem of inconsistent socialization) was to demonstrate advantages of care pathway enactment to junior physicians. Senior medical professionals demonstrated to juniors that care pathway enactment may outperform professional expertise (field log, p. 113). Interviewees underlined the importance of demonstrating care pathway enactment by stating, for example: 'The crucial aspect is that I show them [juniors], elaborate and use this [care pathways] myself' (senior physician I6).

Summary of situation 1: Standardizing work to overcome inconsistent socialization. To overcome the day-to-day problem of inconsistent medical socialization of junior professionals, medical professionals maintain care pathway enactment, and taken together, the practices used to maintain these pathways can be summarized as cognitive inscribing. As one junior medical professional told us: 'That is why they adopted these standards [care pathways] in the first place: To make sure that specific steps are always taken . . . irrespective of the individual . . . physician' (junior physician I6). Senior professionals maintained care pathway enactment to achieve consistency, which appeared to be particularly relevant for treatments with publicly acclaimed care pathways. Maintaining care pathways allows for consistent training of state-of-the-art medical practice: '[Junior physicians] have little knowledge of the current . . . literature. . . . What really matters here is how the leadership team [senior physicians], like me, decides on care pathways and standards, demonstrates their application and uses them on their own' (senior physician I6). These care pathways are maintained through a set of practices resulting in the cognitive inscribing of care pathway enactment in both senior and junior medical professionals' cognitive structures ('burned into your head', junior physician I2). In sum, physicians in situation 1 maintain care pathways because they solve the problem of inconsistent professional socialization.

Situation 2: Monitoring to overcome sanctioning risks

Situation 2 (see Table 4) suggests that medical professionals enact care pathways when the care pathway has a high level of public acclaim and the treatment is one of high complexity (e.g. bone

marrow transplantation), irrespective of task frequency and the level of expertise within a department. Again, this result only partially reflects our initial theorizing. While care pathways with public acclaim could be maintained for reasons of transparency and accountability (Evetts, 2013; Svensson, 2010), the irrelevancy of both task frequency and the level of expertise within a department suggest that standardizing work in this situation is not related to the need for economizing on personnel resources. It also conflicts with our argument that complex *but infrequent* treatments (March et al., 1991; Zollo & Winter, 2002) could result in the maintenance of standards: Because these treatments are frequent, they should provide sufficient opportunities for medical professionals to internalize the different treatment elements and interdependencies.

Analysis phase II qualitative findings (see Figure 2) revealed that, in situation 2, physicians maintained care pathways to limit sanctioning risks. Sanctioning is not limited to intra-professional sanctions, but may also come from other societal stakeholders, such as the state, demanding transparency and accountability from physicians to ensure lawful conduct and to improve public health (Goodrick & Reay, 2016; Hafferty & Light, 1995).

Problem: Sanctioning risks. Situation 2 encompasses complex treatments that usually require substantial coordination between professionals and are considered risky because these treatments usually incorporate a high number of physicians and specialists performing interdependent treatment steps, increasing the likelihood of errors. We found that two types of error were considered particularly common for complex treatments: treatment errors (i.e. failure to correctly execute all required treatment steps) and handoff errors (i.e. failure to exchange relevant patient information when passing responsibility for a patient on to another medical professional). Blood transfusions are one example of a treatment with complex interactions among patient, physician and laboratory staff (e.g. creating a blood culture, testing blood culture responsiveness, marking the patient, marking the blood batch, re-checking blood type, etc.). A single error in this process is consequential because 'blood transfusion incidents are fatal or at least extremely dangerous' (field notes, p. 45).

Highly complex medical tasks are prone to physician errors, and these errors can result in adverse medical outcomes (Kohn, Corrigan, & Donaldson, 2000; Van Matre, Slovensky, & McLaughlin, 2013). Additionally, when an error-prone condition is covered by a care pathway with high public acclaim, any treatment error that does occur increases the likelihood of legal repercussions (e.g. dependants seeking compensation payments) and social sanctions by peers. The public acclaim for these pathways creates strong social expectations for physicians to account appropriately for their treatment performances, and medical professionals who fail to live up to these expectations while performing complex, error-prone tasks expose themselves to sanctions from stakeholders. In consequence, sanctioning risks present a day-to-day problem for medical professionals in situation 2. Several interviewees stated that complex treatments involve multiple physicians; for example, '[treating] a multiple trauma involves a trauma surgeon, a neurosurgeon, a radiologist, an internal medicine specialist, and an anaesthetist . . . and they all work differently' (junior physician I1). These complex treatments present a higher risk of coordination problems, resulting in increased likelihood of treatment error. If care pathways specifying a specific treatment are publicly acclaimed, any treatment errors resulting from care pathway *deviation* heightens the risk of legal consequences (senior physician I7). As pointed out by interviewees in informal conversations with those in the field (senior physician I6; junior physician I2; field notes, p. 9), substantive treatment errors may lead to legal repercussions for the medical professional responsible for the treatment and also harm the reputation of the department. To reduce sanctioning risks, we found that medical professionals in situation 2 maintained care pathways using a distinct set of practices constituting self- and social monitoring: anticipating repercussions, questioning deviation and documenting treatment.

Practice: Anticipating repercussions. In our interviews and observation, we noted that both senior and junior medical professionals seemed to constantly remind themselves that treatment errors may have substantive repercussions: 'You have the sole responsibility. As soon as an error occurs, it is your fault. You cannot run off and say: "I did not know this" or "the head physician told me". It is your own responsibility [as a physician]' (junior physician I1). In a similar fashion, a senior physician stated: 'The legal side, I think, *that* is a strong motivation for it [enacting care pathways]. That you have to justify yourself [to peers] is probably less important, but the legal justification is not insignificant' (senior physician I6). References to 'extreme fear of compensation payments' and 'existential anxiety of imprisonment' (junior physician I2) were common. In consequence, medical professionals we observed and interviewed who treat these cases (i.e. complex treatments and substantive public acclaim backing care pathway enactment) seemed to remind themselves constantly that non-enactment of the care pathway was a 'grey area', and one to be avoided (junior physician I5).

Practice: Questioning deviation. We also noted that seniors questioned both their peers and juniors when either one did not enact the care pathway, and that juniors questioned other juniors when they noticed deviations. For example, we witnessed two junior physicians discussing the coordination of treatment for blood clots, a potentially life-threatening condition, when one of them insisted, 'No, our pathway clearly says [to do it another way]', and eventually referred this other physician to the respective pathway in the internal network (field notes, pp. 58, 107–108). If problems arose, having relied on the care pathway was always the better option because physicians could justify their actions ('Okay – we followed the pathway'), which limited the risk of critical questions, such as 'Why did you do that in a different way?' (field log, p. 111).

Practice: Documenting treatment. Finally, we observed that medical professionals were acutely aware of 'mak[ing] sure that everything [patient treatment] is documented correctly' (field notes, p. 47). As a legal requirement (BGB, § 630f) all patient treatment is routinely documented anyway but care pathways were associated with 'extensive documentation' (field notes, p. 18) because it allows other physicians and administrators to detect deviations from care pathways, and thus facilitates other practices, such as the questioning of deviation detailed above.

Summary of situation 2: Standardizing work to overcome risk of error. In error-prone treatments, enacting pathways protects physicians from repercussions and sanctions when they fail at a complex task. 'Under these conditions, it's just easier and safer for the individual actors to draw on a pathway than to decide on their own [and expose themselves to risk]' (senior physician I8). Considering the constant flow of physicians and patients in university hospitals, coordinating complex treatments is a common physician concern, and one where persistent care pathway enactment supports medical professionals. Without care pathway enactment, 'coordination between the physicians involved would not work at all, because [the different specialists participating in the treatment procedure] work completely differently' (junior physician I1). Care pathway enactment was considered a lifeline: 'Oh, I am glad to have this [care pathway], so I know when to call whom and who needs to be involved in this [treatment procedure]' (field notes, p. 104). Maintaining pathways allows professionals to reduce the risk of coordination errors and objectionable medical outcomes as well as to conform to a publicly acclaimed approach.

Because error-prone procedures are heavily scrutinized, physicians maintain care pathways in situation 2 using practices of self- and social monitoring. The high risk of treatment and handoff errors in conjunction with the public acclaim for a specific treatment approach prompted physicians to avoid treatment that deviates from that specified in the care pathway, and which therefore

lies in the 'grey area'. Here, maintaining care pathways enables medical professionals to minimize their personal risk of sanctions and at the same time respond to state demands for transparent and accountable professional practice (Hafferty & Light, 1995; Martin, Currie, et al., 2017).

Situation 3: Patching to overcome lack of resources

Finally, situation 3 (Table 4) suggests another answer to the 'when' question by describing a combination of circumstances that are sufficient to prompt care pathway maintenance: low levels of professional expertise in conjunction with low levels of public acclaim for a pathway (e.g. only a few case reports have been published on the care pathway), low task complexity (e.g. treating arterial hypertension) and high task frequency. This result only partially reflects initial theorizing. We argued that a combination of relatively similar treatments across cases along with many cases subject to the treatment would prompt care pathway maintenance because it enables medical professionals to economize on scarce resources (Hansen et al., 1999) and thus may offer substantive standardization advantages. The low levels of professional expertise in these departments suggests that care pathways may serve as a substitute for guidance from senior professionals. The result – that these care pathways were maintained despite a lack of public acclaim – is in line with this interpretation, because it fits with the notion that task completion – and not calls for transparent, evidence-based medicine (Currie & Harvey, 2000) – explains why frontline professionals engage in standardizing work in this situation.

Analysis phase II findings (Figure 2) support and expand this interpretation of why care pathways were maintained in this situation. Specifically, they suggest that maintenance of care pathway enactment enables junior physicians to go on with their daily work despite lacking resources. The lack of resources results from the demands of other societal stakeholders, such as the medical insurance market and the state both applying increased pressure on medical professionals to improve efficiency and reduce cost (Goodrick & Reay, 2016), leading to a lower availability of (expensive) senior physicians in some departments.

Problem: Lack of resources. Junior medical professionals lack medical expertise, time and guidance, constituting a core day-to-day problem of lack of resources driving situation 3. One senior doctor explained that 'the young colleagues are completely overwhelmed with the everyday business' (field notes, p. 9) and another stated that juniors usually lack the 'basic knowledge to function in the department' (field notes, p. 14). This was a common observation across different departments exhibiting a low senior-to-junior ratio and was confirmed by both senior and junior physicians we interviewed. One junior physician, for example, stated that she struggled to 'complete one day's work within one day' (junior physician I1). Our data contains several statements from juniors in situation 3 who lack supervision (junior physician I1, junior physician I4, field log, p. 113); time to treat patients (field log, pp. 49, 108–109); and experience dealing with specific, but comparably non-complex diseases (junior physician I2; senior physician I7; field log, p. 105). During our observations of junior physicians' daily work, it became obvious that young doctors ran the risk of being overwhelmed by the pressing demands of clinical reality (field notes, pp. 14; 19–20; 40) and that care pathways gave them a needed resource boost.

Departments covered by situation 3 exhibit a low senior-to-junior ratio, resulting in junior physicians assuming responsibility for a large array of comparatively simple treatments. Senior physicians usually made the morning rounds and then left, and as one junior physician stated, 'then you'll have to see how you'll manage the day and whether something unexpected happens' (field notes, p. 107). University hospitals usually see a constant flow of junior physicians rotating among different departments, which results in a high inflow of junior physicians new to the department

and limited possibilities to grow a pool of more experienced junior physicians. In departments covered by situation 3, that lacked sufficient resources, we found that maintaining care pathway enactment resulted from three 'patching' practices: ad-hoc action guidance, fulfilling learning requirements and assuring accessibility.

Practice: Using ad-hoc action guidance. Junior medical professionals relied on care pathways as physical, ad-hoc action guides to verify treatment steps (field notes, pp. 14, 19; field log, pp. 105, 106; senior physician I7). In informal talks with junior physicians, we were told how care pathways are employed to assist young professionals on-the-spot when guidance by experienced professionals is not available: 'These things support me. I'm glad to know . . . what I have to prepare [to carry out the treatment]' (field notes, p. 15). Because pathways serve as a support tool for physicians who are young and new to the department, these physicians used them as an instrument to get through their daily work. Another junior physician reiterated: '[S]uch a pathway is the best thing [for] you; in particular when you're an inexperienced newbie, you're in constant need of guidance. However, the problem is that you won't receive constant guidance from senior physicians' (Junior physician I4).

Practice: Fulfilling learning requirements. Junior professionals, prior to their first workday in some of these departments, receive all relevant care pathways via email. Learning these pathways was a requirement before commencing work (for a similar observation, see Faraj & Xiao, 2006). One junior physician told us: 'Before I started working in this department, they mailed me all the pathways and I had to work through them all at first' (junior physician I1). Because there is very little personal supervision of junior physicians in departments in situation 3 (one of several differences compared to situation 1 – inconsistent professional socialization), these departments introduced for rookie juniors a learning requirement, which demanded that they be familiar with all relevant care pathways. The same junior physician (I1) reflected on this situation:

> When I first started working here [another department], someone plunked down a ring binder next to me, telling me to get going. The folder contained all basic care pathways I needed to know when working here; however, it was still a 5 cm folder! . . . You had to work through that thing in order to know how to accomplish your first shift on your own. (junior physician I1)

Practice: Assuring accessibility. Finally, we observed that junior physicians advised their peers on where to find printouts or digital copies of care pathways in the department facilities. Usually, these were easily accessible throughout the department. A junior physician explained: 'During my first week, someone showed me [the pathways] in the internal system. After that, I selectively looked those up whenever something was unclear to me' (field notes, p. 17). Typical locations for care pathways included the local network drive, printouts on the walls of the physician room, cue cards in the physicians' scrub pockets or notes taped to the patient's bed (field notes, pp. 7, 17, 57; junior physician I1). Such easy accessibility was crucial, because departments in our situation 3 simply lacked time and senior resources to 'take each junior by the hand and guide them through everything for a week' (field log, p. 113).

Summary of situation 3: Standardizing work to overcome lack of resources. In situation 3, care pathways are maintained because they enable junior medical professionals 'to get on' with treating patients in spite of a considerable lack of resources, such as behavioural templates (field notes, p. 109). Despite their lack of expertise, junior physicians are expected to perform non-complex but frequently occurring tasks in a professional and efficient manner. Their inability to independently

address such tasks commonly puts junior physicians in uncomfortable circumstances – both by demonstrating their medical incapability and by delaying patient treatment: '[It's] not necessarily embarrassing, but [it is] annoying if you constantly have to ask someone: "Listen, I don't know this stuff – can you help me out one more time?" That becomes really tedious after some time' (junior physician I4). Maintenance of care pathway enactment in situation 3 not only allows physicians to treat patients appropriately, but it also enables junior physicians to 'save face' in encounters with more experienced nurses, who would quickly call out and ridicule junior physicians who were unsure about treatment steps (field notes, p. 24; field log, p. 105; senior physician I6).

In situation 3, care pathways are maintained because they enable junior professionals to function even when they lack resources. In Germany, this lack of resources predominately results from some hospital departments operating under significant demands to increase the economic effectiveness of medical practice – placing even some departments in university hospitals under considerable cost pressure (Augurzky et al., 2014).

Discussion

To advance our understanding of frontline professionals' standardizing work – and to complement theory on frontline professionals' resistance to standards (e.g. McDonald et al., 2006; Ramirez, 2013) – we explored when, why and how frontline medical professionals actively maintain care pathway enactment. We found that physicians do standardizing work in specific situations to overcome perceived day-to-day problems by relying on particular practices. Expanding on these findings, we offer three contributions to the nascent literatures on frontline professionals (e.g. Reay et al., 2016) – in particular frontline professionals and standards (Ament et al., 2015; McDonald et al., 2006; Ramirez, 2013) – and one contribution to the burgeoning coalface perspective literature (Barley, 2017).

Frontline professionals' standardizing work: A problem-driven coalface perspective

First – by introducing a problem-driven coalface perspective on standardizing work – our study offers a novel approach to studying standards that is not possible under the autonomy perspective (e.g. Light, 2010). It allows us to see that frontline professionals maintain standardization when it provides a solution – at least temporarily – to a pressing problem. This notion reflects concepts such as practical-evaluative agency (e.g. Emirbayer & Mische, 1998), which suggest that actors perceive a present situation as problematic and that 'something must be done' to remedy the situation (Emirbayer & Mische, 1998, p. 998) or 'to get the job done' (Smets & Jarzabkowski, 2013, p. 1304). After characterizing a situation, reflecting on it and deciding on an appropriate action, the execution (i.e. standardizing work) may 'mark not a happy resolution but rather the fulfilment of a lesser evil' (Emirbayer & Mische, 1998, p. 1000).

The problem-driven coalface perspective provides a more comprehensive account of the diverse motives and contingencies of professionals' standardizing work than the autonomy perspective does. While the autonomy perspective provides important insights into why professionals resist standardization (e.g. Armstrong, 2002; McDonald et al., 2006), it struggles to explain why frontline professionals actively maintain standardization, as standardizing work implies a loss of individual professional autonomy (Timmermans & Berg, 2003). The problem-driven coalface perspective overcomes this issue by relaxing the autonomy perspective's assumptions on the tight connection between frontline professionals' identity, motivation and behaviour. Instead, the practical-evaluative conceptualization of agency described above allows for a more flexible and complex account, thereby addressing calls to overcome one-sided and simplistic conceptualizations

of professionals' motivation and behaviour (Muzio et al., 2013). Focusing on the problems that frontline professionals face helps to overcome inconsistencies between the standardization literature – which argues, for example, that physicians reject guidelines because autonomy constitutes their medical identity (McDonald et al., 2006) – and other research on frontline professionals showing that – in some situations – they themselves actively limit their individual autonomy (e.g. Heaphy, 2013; Wright et al., 2017).

Second – by accounting for the social embeddedness of frontline professionals' standardizing work – the problem-driven coalface perspective connects to recent work emphasizing the social embeddedness of professionals (Reay et al., 2016; Suddaby & Muzio, 2015). Frontline professionals are socially embedded in society – that is, they depend on the nested social arrangements that extend beyond their professional community (Evetts, 2013; Muzio et al., 2013; Noordegraaf, 2011). While the autonomy perspective tends 'not to consider the wider ecological context' (Light, 2010, p. 271), the coalface perspective accounts for these dependencies because they shape the problems (e.g. sanctioning risks) driving frontline professionals' standardizing work.

Connecting these two literatures – frontline standardization and the social embeddedness of professionals (Reay et al., 2016; Suddaby & Muzio, 2015) – matters, because frontline professionals have to address daily demands imposed on them by other societal stakeholders (Wright et al., 2017). These stakeholders – such as the State (Hafferty & Light, 1995; Martin, Currie, et al., 2017), the market (Augurzky et al., 2014) and patients (Oborn, Barrett, Komporozos-Athanasiou, & Chan, 2012) – demand that frontline professionals 'align their policies and practices more closely and . . . conform to external evaluative criteria' (Bromley & Powell, 2012, p. 484). Any perspectives that downplay such demands will provide an increasingly incomplete characterization of frontline professionals' behaviour.

The coalface perspective introduced here provides a balanced account of how societal demands impact frontline professional behaviour. It suggests that frontline professionals address these demands – manifested in day-to-day problems – by actively maintaining standards in specific situations. Because it accounts for these situations and stresses frontline professionals' practical-evaluative agency, the coalface perspective incorporates the social embeddedness of professionals (Reay et al., 2016; Suddaby & Muzio, 2015) while avoiding the problem of socially determining individuals' motives and behaviours (Battilana & D'Aunno, 2009). This perspective therefore provides a balanced approach to reconciling divergent assessments within the literature on professionals of how frontline professionals' behaviour is impacted by societal demands.

Third – by describing how frontline professionals engage in standardizing work – we complement earlier studies describing the practices of resisting standardization (e.g. Allen, 2014; Currie & Spyridonidis, 2016). For example, Allen (2014) found that individual physicians discursively undermine the credibility and effectiveness of care pathways in their departments. Currie and Spyridonidis (2016) found that physicians actively delegated standardizing work to nurses. A smaller stream of research has covered passive resistance. For example, Bruns (2009) shows how individual frontline scientists passively resist procedural standardization by neglecting safety rules in a biology laboratory. Theoretically, practices of resistance differ substantially from practices of active maintenance work, since resistance practices may draw from considerable motivational momentum and high levels of salience associated with standards being introduced.

Practices of standardizing work exhibit different premises – they are responses to day-to-day social entropy and small-scale, everyday disruptions that create the need for active maintenance (Dacin et al., 2010; Heaphy, 2013; Lok & De Rond, 2013). Reflecting on these differences expands our understanding of how situational characteristics create these different sets of practices. Specifically, the practices of standardizing work we observe do not presume high levels of motivational momentum because they feed on 'emerging demands, dilemmas and ambiguities of presently

evolving situations' (Emirbayer & Mische, 1998, p. 971). They operate on low-salience events, thereby removing the assumption that actors are aware of the effects that their practices have on social structures (Smets et al., 2017). They are common, because 'mundane disturbances' occur more frequently than 'major breakdowns of day-to-day practice' (Powell & Rerup, 2017, p. 321). Because frontline professionals' standardizing work is common and pervasive – rather than acts of active resistance or passive negligence – our study serves to more accurately capture the broad range of phenomena seen in professional work.

Implications for coalface-perspective research

We contribute to coalface-perspective research by bridging an emerging disconnect. While conceptual and empirical coalface research agree that situations matter in explaining actors' maintenance of social standards and structures (Barley, 2017; Dacin et al., 2010), conceptual work stresses the multilevel nature of influences shaping such situations. In her conceptual work, Bechky (2011, p. 1157) emphasizes that coalface research should incorporate 'the social processes that take place at different levels of organizational life' by seeking 'to interconnect those multiple sets of activities'. In contrast, as pointed out by Martin, Currie, et al. (2017), the nascent stream of empirical coalface research tends to focus on the actor level. In addition to causing a fault-line between conceptual and empirical work, this gap may prevent us from advancing our understanding of what constitutes relevant characteristics of situations. Our study adds to earlier empirical studies (Dacin et al., 2010; Smets et al., 2012) because it is the first we know of that captures the multilevel structure of situations. By investigating the field-level, organization-level and task-level characteristics that affect actors' maintenance work, we highlight the importance of this multilevel structure of situations. In consequence, our study may provide a foundation to advance empirical coalface research by reconnecting it to the conceptual roots of this perspective.

Limitations and Conclusion

This study seeks to advance our understanding of frontline professionals' standardizing work. We explored when, why and how medical professionals maintain care pathway enactment in patient treatment. While our coalface perspective on standardizing work addresses these questions – and thereby contributes to the literature on professionals – our study also has limitations that should motivate future research.[7]

First, as is common for exploratory studies seeking to contribute novel theory, our empirical setting limits the generalizability of our results. While we claim that our problem-driven coalface perspective on standardizing work is a generic one, and thus should be applicable to different professions, our empirical study focuses on medical professionals maintaining one specific standardization technique. Readers should bear this limitation in mind when applying our work to other settings.

Second, we call for future research to explore day-to-day, problem-driven standardizing work in other settings. We hope to inspire future ethnographic studies that focus on how variations in situations (i.e. situational characteristics) may change or eliminate day-to-day problems, and to evaluate the persistence or non-persistence of mundane standardizing work. Whether (elite) professionals, managers or policy-makers introducing standards appears to be a crucial contingency that future comparative research could explore. Studying these situational dynamics and the link between micro-level practices and macro-level influences, as well as their consequences, will advance the processual nature of frontline professional work.

Third, because the collection and analysis of our data was guided by a coalface perspective linking situations, rationales and practices of standardizing work, our data do not lend themselves to an ethnomethodological interpretation. Recent research on frontline professionals (e.g. Heaphy, 2013) has demonstrated the explanatory power of this perspective for understanding how frontline professionals use standards to repair breaches in the social order. These recent developments connect to classic research on reception personnel's rule-use (Zimmerman, 1970) and should inspire future research on standardizing work by frontline professionals. Researchers should also go beyond our binary measurement of the maintenance of care pathway enactment and explore different qualities of maintenance that our study could not cover.

Overall, despite these limitations, our problem-driven coalface perspective on frontline professionals' standardizing work provides a novel perspective on the complex relation between frontline professionals and standardization. It builds on and expands recent theory on the normative nature of professions (e.g. Evetts, 2013; Muzio et al., 2013; Noordegraaf, 2011; Suddaby & Muzio, 2015) and offers a counterpoint to more traditional perspectives on professional autonomy and self-interest. The problem-driven coalface perspective does so by accounting for both frontline professionals' social embeddedness and practical-evaluative agency.

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Notes

1. Because our study focuses on the active maintenance of care pathways, our data on non-maintenance is limited. However, physicians provided accounts similar to what has been reported in earlier studies focusing on professionals' resisting standardizing work (e.g. Allen, 2014; Bruns, 2009; Gabbay & le May, 2011). For example, one physician (university hospital II) suggested the care pathway was impractical for daily use. Another noted that the care pathway enactment 'withered away' because physicians failed to actively maintain it (university hospital III). A more extensive and detailed account of why and how physicians reject the maintenance of care pathways is provided by Gabbay and le May (2011).
2. To explain what (configurations of) conditions drive an outcome, fsQCA builds on the notion of necessary and sufficient conditions. Since procedures uncovering sufficient conditions cannot be relied on to uncover necessary conditions, we analysed necessary and sufficient conditions separately, beginning with the necessary conditions. Logically, necessary conditions are always present if the outcome is present, and there must not be an instance in which the outcome is present and the condition absent (Schneider & Wagemann, 2010). By convention, a consistency value of at least 0.9 is required for indicating necessary conditions (Schneider & Wagemann, 2007). To test for necessary conditions, we applied the 'necessary conditions' procedure provided by fsQCA 2.5. In scrutinizing the results of the analysis, we found that

the consistency values of all conditions (as well as their negations) are well below 0.9, suggesting that fuzzy-set membership values of the explanatory conditions across all cases are lower than outcome-membership values (Goertz, 2006). Therefore, none of the situational characteristics was considered necessary for care pathway enactment. We continued our analysis by exploring sufficient conditions. We applied a consistency threshold (0.90) that is stricter than the consistency threshold (0.80) suggested by Ragin (2008). In the course of the analysis, the fsQCA 2.5 software allows for three types of solutions. Whereas the parsimonious and intermediate solutions incorporate logical remainders to varying extents, the complex solution incorporates only situations that occur empirically (Ragin, 2000) and therefore represents the most conservative approach (Vis, 2012). Accordingly, our analysis relies on the complex solution.

3. As search terms, we used all synonyms for care pathways described by the European Pathway Association (2012): 'clinical pathway*', 'clinical care pathway*', 'care pathway*', 'critical pathway*', 'care path*', 'integrated care pathway*', 'case management plan*', 'care map'. Furthermore, we restricted our search to articles published in English or German.
4. Setting the threshold to zero was not possible, as the sample includes cases exhibiting no citations on care pathways. Thresholds cannot be placed on values covered by empirical data (Ragin, 2006).
5. While care pathway enactment usually covers all relevant treatment steps for a specific disease and these steps may also include nursing work, the present study focuses on medical doctors as relevant actors. This decision naturally excludes nurses and other service personnel from our analysis. However, given that our study intends to explain maintenance work by medical professionals – and medical doctors in Germany represent the only participants in a treatment who have legally sanctioned discretion regarding the treatment of patients – excluding nurses and other service personnel from our analysis seems warranted.
6. The researcher worked as an intern (for legal reasons), a common role in these departments. Because interns in university hospitals in Germany frequently conduct research as they pursue their medical doctorate prior to completing their degree programme as medical professionals, the author was able to easily blend into the constant flow of medical interns.
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References

Approbationsordnung für Ärzte (2002).

Abbott, A. (1988). *The system of professions: An essay on the division of expert labor*. Chicago: University of Chicago Press.

Adler, P. S., & Kwon, S.-W. (2013). The mutation of professionalism as a contested diffusion process: Clinical guidelines as carriers of institutional change in medicine. *Journal of Management Studies*, *50*, 930–962.

Allen, D. (2014). Lost in translation? 'Evidence' and the articulation of institutional logics in integrated care pathways: From positive to negative boundary object? *Sociology of Health & Illness*, *36*, 807–822.

Ament, S. M. C., de Groot, J. J. A., Maessen, J. M. C., Dirksen, C. D., van der Weijden, T., & Kleijnen, J. (2015). Sustainability of professionals' adherence to clinical practice guidelines in medical care: A systematic review. *BMJ Open*, *5*, 1–13.

Armstrong, D. (2002). Clinical autonomy, individual and collective: The problem of changing doctors' behaviour. *Social Science & Medicine*, *55*, 1771–1777.

Armstrong, P. J., Hyman, J. D., & Goodman, J. F. B. (1981). *Ideology and shop-floor industrial relations*. London: Croom Helm.

Augurzky, B., Krolop, S., Hentschker, C., Pilny, A., & Schmidt, C. M. (2014). *Krankenhaus Rating Report 2014*. Heidelberg: Medhochzwei Verlag.

Bär, S. (2011). *Das Krankenhaus zwischen ökonomischer und medizinischer Vernunft*. Wiesbaden: VS Verlag für Sozialwissenschaften.

Barley, S. R. (2017). Coalface institutionalism. In R. Greenwood, C. Oliver, T. B. Lawrence, & R. E. Meyer (Eds.), *The Sage handbook of organizational institutionalism*. Los Angeles: SAGE Publications.

Battilana, J., & D'Aunno, T. (2009). Institutional work and the paradox of embedded agency. In T. B. Lawrence, R. Suddaby, & B. Leca (Eds.), *Institutional work: Actors and agency in institutional studies of organizations*. Cambridge: Cambridge University Press.

Bechky, B. A. (2011). Making organizational theory work: Institutions, occupations, and negotiated orders. *Organizational Science*, *22*, 1157–1167.

Becker, M. C. (2005). A framework for applying organizational routines in empirical research: Linking antecedents, characteristics and performance outcomes of recurrent interaction patterns. *Industrial and Corporate Change*, *14*, 817–846.

BGB. (2019). Bürgerliches Gesetzbuch: Dokumentation der Behandlung. Retrieved from http://www.gesetze-im-internet.de/bgb/__630f.html

Blau, P. M. (1955). *The dynamics of bureaucracy*. Chicago: Chicago University Press.

Bohmer, R. M. (2009). *Designing care*. Boston, MA: Harvard Business Press.

Bromley, P., & Powell, W. W. (2012). From smoke and mirrors to walking the talk: Decoupling in the contemporary world. *Academy of Management Annals*, *6*, 483–530.

Bruns, H. C. (2009). Leveraging functionality in safety routines: Examining the divergence of rules and performance. *Human Relations*, *62*, 1399–1426.

Brunsson, N., & Jacobsson, B. (2002). *A world of standards*. Oxford: Oxford University Press.

Bryman, A. (2008). *Social research methods*. Oxford: Oxford University Press.

Campbell, H., Hotchkiss, R., Bradshaw, N., & Porteous, M. (1998). Integrated care pathways. *British Medical Journal*, *316*, 133–137.

Chan, R. J., & Webster, J. (2013). End-of-life care pathways for improving outcomes in caring for the dying. *The Cochrane Library*.

Charmaz, K. (2014). *Constructing grounded theory*. London: SAGE Publications.

Chen, K.-H., Chen, C., Liu, H.-E., Tzeng, P.-C., & Glasziou, P. P. (2014). Effectiveness of paediatric asthma clinical pathways: A narrative systematic review. *Journal of Asthma*, *51*, 480–492.

Ciapponi, A., Lewin, S., Herrera, C. A., Opiyo, N., Pantoja, T., Paulsen, E., . . . Oxman, A. D. (2017). Delivery arrangements for health systems in low-income countries: An overview of systematic reviews. *Cochrane Database of Systematic Reviews*.

Cresswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: SAGE Publications.

Crilly, D., Zollo, M., & Hansen, M. T. (2012). Faking it or muddling through? Understanding decoupling in response to stakeholder pressures. *Academy of Management Journal*, 55, 1429–1448.

Currie, G., & Spyridonidis, D. (2016). Interpretation of multiple institutional logics on the ground: Actors' position, their agency and situational constraints in professionalized contexts. *Organization Studies*, *37*, 77–97.

Currie, V. L., & Harvey, G. (2000). The use of care pathways as tools to support the implementation of evidence-based practice. *Journal of Interprofessional Care*, *14*, 311–324.

Dacin, M. T., Munir, K., & Tracey, P. (2010). Formal dining at Cambridge colleges: Linking ritual performance and institutional maintenance. *Academy of Management Journal*, *53*, 1393–1418.

Demski, J. S. (2002). Enron et al. – A comment. *Journal of Accounting & Public Policy*, *21*, 129–129.

Egan, T., & Jaye, C. (2009). Communities of clinical practice: The social organization of clinical learning. *Health*, *13*, 107–125.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, *14*, 532–550.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, *50*, 25–32.

Emirbayer, M., & Mische, A. (1998). What is agency? *American Journal of Sociology*, *103*, 962–1023.

European Pathway Association. (2012). Care pathways. Retrieved from http://www.e-p-a.org/

Evetts, J. (2013). Professionalism: Value and ideology. *Current Sociology*, *61*, 778–796.

Faraj, S., & Xiao, Y. (2006). Coordination in fast-response organizations. *Management Science*, *52*, 1155–1169.

Ferlie, E., Fitzgerald, L., Wood, M., & Hawkins, C. (2005). The nonspread of innovations: The mediating role of professionals. *Academy of Management Journal*, *48*, 117–134.

Fiss, P. C., Cambré, B., & Marx, A. (Eds.) (2013). *Configurational theory and methods in organizational research*. Bingley, UK: Emerald.

Freidson, E. (1994). *Professionalism reborn: Theory, prophecy, and policy*. Chicago: University of Chicago Press.

Freidson, E. (2001). *Professionalism: The third logic*. Cambridge: Polity.

Gabbay, J., & le May, A. (2011). *Practice-based evidence for healthcare: Clinical mindlines*. London: Routledge.

Galbraith, J. R. (1973). *Designing complex organizations*. Reading, MA: Addison-Wesley.

Gawande, A. (2009). *The checklist manifesto: How to get things right*. New York: Metropolitan Books.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods*, *16*, 15–31.

Goertz, G. (2006). Assessing the trivialness, relevance, and relative importance of necessary or sufficient conditions in social science. *Studies in Comparative International Development*, *41*(2), 88–109.

Goodrick, E., & Reay, T. (2016). An institutional perspective on accountable care organizations. *Medical Care Research and Review*, *73*, 685–693.

Hafferty, F., & Light, D. W. (1995). Professional dynamics and the changing nature of medical work. *Journal of Health and Social Behavior*,132–153.

Hansen, M. T., Nohria, N., & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review*, *77*, 106–116.

Harvey, W. S. (2011). Strategies for conducting elite interviews. *Qualitative Research*, *11*, 431–441.

Heaphy, E. D. (2013). Repairing breaches with rules: Maintaining institutions in the face of everyday disruptions. *Organization Science*, *24*, 1291–1315.

InEK. (2012). Retrieved from http://www.g-drg.de

Jamous, H., & Peloille, B. (1970). Professions or self-perpetuating systems? Changes in the French university-hospital system. In J. Jackson (Ed.), *Professions and professionals*. Cambridge: Cambridge University Press.

John, L. K., Loewenstein, G., & Prelec, D. (2012). Measuring the prevalence of questionable research practices with incentives for truth telling. *Psychological Science*, *23*, 524–532.

Johnson, T. (1972). *Professions and power*. London: Macmillan.

Jones, C., Hesterly, W. S., & Borgatti, S. P. (1997). A general theory of network governance: Exchange conditions and social mechanisms. *Academy of Management Review*, *22*, 911–945.

KHEntG. (2013). Gesetz über die Entgelte für voll- und teilstationäre Krankenhausleistungen. Retrieved from http://www.gesetze-im-internet.de/khentgg/index.html

Kohn, L. T., Corrigan, J., & Donaldson, M. S. (2000). *To err is human: Building a safer health system*. Washington, DC: National Academies Press.

Kwan, J., & Sandercock, P. (2005). In-hospital care pathways for stroke: An updated systematic review. *Stroke*, *36*, 1348–1349.

Light, D. W. (2010). Health-care professions, markets, and countervailing powers. In C. E. Bird (Ed.), *Handbook of medical sociology*. Nashville, TN: Vanderbilt University Press.

Lok, J., & De Rond, M. (2013). On the plasticity of institutions: Containing and restoring practice breakdowns at the Cambridge University Boat Club. *Academy of Management Journal*, *56*, 185–207.

Mannion, R., & Exworthy, M. (2017). (Re) making the procrustean bed? Standardization and customization as competing logics in healthcare. *International Journal of Health Policy and Management*, *6*, 301–304.

March, J. G., Sproull, L. S., & Tamuz, M. (1991). Learning from samples of one or fewer. *Organization Science*, *2*, 1–13.

Martin, G., Currie, G., Weaver, S., Finn, R., & McDonald, R. (2017). Institutional complexity and individual responses: Delineating the boundaries of partial autonomy. *Organization Studies*, *38*, 103–127.

Martin, G. P., Kocman, D., Stephens, T., Peden, C. J., & Pearse, R. M. (2017). Pathways to professionalism? Quality improvement, care pathways, and the interplay of standardisation and clinical autonomy. *Sociology of Health & Illness*, *39*, 1314–1329.

McDonald, R., Waring, J., & Harrison, S. (2006). Rules, safety and the narrativisation of identity: A hospital operating theatre case study. *Sociology of Health & Illness*, *28*, 178–202.

MedLine. (2012). Retrieved from www.webofknowledge.com

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: SAGE Publications.

Muzio, D., Brock, D. M., & Suddaby, R. (2013). Professions and institutional change: Towards an institutionalist sociology of the professions. *Journal of Management Studies*, *50*, 699–721.

Noordegraaf, M. (2011). Risky business: How professionals and professional fields (must) deal with organizational issues. *Organization Studies*, *32*, 1349–1371.

Oborn, E., Barrett, M., Komporozos-Athanasiou, A., & Chan, Y. E. (2012). Discourses in health care policy: Comparing UK and Canada. In H. Dickinson & R. Mannion (Eds.), *The reform of health care: Shaping, adapting and resisting policy developments*. London: Palgrave Macmillan.

Parker, D., & Lawton, R. (2000). Judging the use of clinical protocols by fellow professionals. *Social Science & Medicine*, *51*, 669–677.

Perrow, C. (1986). *Complex organizations: A critical essay*. Glenway: Scott-Foresman.

Podila, P. V., Ben-Menachem, T., Batra, S. K., Oruganti, N., Posa, P., & Fogel, R. (2001). Managing patients with acute, nonvariceal gastrointestinal hemorrhage: Development and effectiveness of a clinical care pathway. *American Journal of Gastroenterology*, *96*, 208–219.

Powell, W. W., & Rerup, C. (2017). Opening the black box: The microfoundations of institutions. In R. Greenwood, C. Oliver, T. B. Lawrence, & R. E. Meyer (Eds.), *The Sage handbook of organizational institutionalism*. Los Angeles: SAGE Publications.

Ragin, C. C. (2000). *Fuzzy-set social science*. Chicago: University of Chicago Press.

Ragin, C. C. (2006). Set relations in social research: Evaluating their consistency and coverage. *Political Analysis*, *14*, 291–310.

Ragin, C. C. (2008). *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago: University of Chicago Press.

Ragin, C. C., & Davey, S. (2009). *Fuzzy-set/qualitative comparative analysis 2.5*. Tucson: Department of Sociology, University of Arizona.

Ragin, C. C., & Fiss, P. C. (2008). Net effects analysis versus configurational analysis: An empirical demonstration. In C. C. Ragin (Ed.), *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago: University of Chicago Press.

Ramirez, C. (2013). 'We are being pilloried for something, we did not even know we had done wrong!' Quality control and orders of worth in the British audit profession. *Journal of Management Studies*, *50*, 845–869.

Reay, T., Goodrick, E., & Hinings, B. (2016). Institutionalization and professionalization. In E. Ferlie, K. Montgomery, & A. R. Pedersen (Eds.), *The Oxford handbook of health care management*. Oxford: Oxford University Press.

Rotter, T., Kugler, J., Koch, R., Gothe, H., Twork, S., van Oostrum, J. M., & Steyerberg, E. W. (2008). A systematic review and meta-analysis of the effects of clinical pathways on length of stay, hospital costs and patient outcomes. *BMC Health Services Research*, *8*, 265–265.

Ruef, M., & Scott, W. R. (1998). A multidimensional model of organizational legitimacy: Hospital survival in changing institutional environments. *Administrative Science Quarterly*, *43*, 877–904.

Rycroft-Malone, J., Fontenla, M., Bick, D., & Seers, K. (2008). Protocol-based care: Impact on roles and service delivery. *Journal of Evaluation in Clinical Practice*, *14*, 867–873.

Schneider, C. Q., & Wagemann, C. (2007). *Qualitative Comparative Analysis (QCA) und Fuzzy Sets*. Opladen: Barbara Budrich.

Schneider, C. Q., & Wagemann, C. (2010). Standards of Good Practice in Qualitative Comparative Analysis (QCA) and Fuzzy-Sets. *Comparative Sociology*, *9*, 397–418.

Schneider, C. Q., & Wagemann, C. (2012). *Set-theoretic methods for the social sciences: A guide to qualitative comparative analysis*. Cambridge: Cambridge University Press.

Schreyögg, J., Tiemann, O., & Busse, R. (2006). Cost accounting to determine prices: How well do prices reflect costs in the German DRG-System? *Health Care Management Science*, *9*, 269–279.

Smets, M., Aristidou, A., & Whittington, R. (2017). Towards a practice-driven institutionalism. In R. Greenwood, C. Oliver, T. B. Lawrence, & R. E. Meyer (Eds.), *The Sage handbook of organizational institutionalism*. Los Angeles: SAGE Publications.

Smets, M., & Jarzabkowski, P. (2013). Reconstructing institutional complexity in practice: A relational model of institutional work and complexity. *Human Relations*, *66*, 1279–1309.

Smets, M., Morris, T., & Greenwood, R. (2012). From practice to field: A multilevel model of practice-driven institutional change. *Academy of Management Journal*, *55*, 877–904.

Suddaby, R., & Muzio, D. (2015). Theoretical perspectives on the professions. In B. Hinings, D. Muzio, J. Broschak, & L. Empson (Eds.), *The Oxford handbook of professional service firms*. Oxford: Oxford University Press.

Svensson, L. (2010). Professions, organizations, collegiality and accountability. In L. Svensson & J. Evetts (Eds.), *Sociology of professions: Continental and anglo-saxon traditions*. Göteborg: Daidalos.

Thomas, G. M., Walker, H. A., & Zelditch, M., Jr. (1986). Legitimacy and collective action. *Social Forces*, *65*, 378–404.

Timmermans, S. (2005). From autonomy to accountability: The role of clinical practice guidelines in professional power. *Perspectives in Biology and Medicine*, *48*, 490–501.

Timmermans, S. (2008). Professions and their work: Do market shelters protect professional interests? *Work and Occupations*, *35*, 164–188.

Timmermans, S., & Berg, M. (2003). *The gold standard*. Philadelphia, PA: Temple University Press.

Timmermans, S., & Epstein, S. (2010). A world of standards but not a standard world: Toward a sociology of standards and standardization. *Annual Review of Sociology*, *36*, 69–89.

Van de Ven, A. H., Delbecq, A. L., & Koenig, R., Jr. (1976). Determinants of coordination modes within organizations. *American Sociological Review*, *41*, 322–338.

Van Matre, J. G., Slovensky, D., & McLaughlin, C. P. (2013). Classification and reduction of medical errors. In W. A. Sollecito & J. K. Johnson (Eds.), *Mclaughlin and Kaluzny's continuous quality improvement in health care*. Burlington, MA: Jones & Bartlett.

Vanhaecht, K., Bollmann, M., Bower, K., Gallagher, C., Gardini, A., Guezo, J., . . . Panella, M. (2006). Prevalence and use of clinical pathways in 23 countries – an international survey by the European Pathway Association. *International Journal of Care Pathways*, *10*, 28–34.

Veerbeek, L., van Zuylen, L., Swart, S. J., van der Maas, P. J., de Vogel-Voogt, E., van der Rijt, C. C., & van der Heide, A. (2008). The effect of the Liverpool care pathway for the dying: A multi-centre study. *Palliative Medicine*, *22*, 145–151.

Vergne, J.-P., & Depeyre, C. (2016). How do firms adapt? A fuzzy-set analysis of the role of cognition and capabilities in U.S. defense firms' responses to 9/11. *Academy of Management Journal*, *59*, 1653–1680.

Vis, B. (2012). The comparative advantages of fsQCA and regression analysis for moderately large-N analyses. *Sociological Methods & Research*, *41*, 168–198.

Weisz, G., Cambrosio, A., Keating, P., Knaapen, L., Schlich, T., & Tournay, V. J. (2007). The emergence of clinical practice guidelines. *Milbank Quarterly*, *85*, 691–727.

Werdan, K., Ruß, M., Buerke, M., Engelmann, L., Ferrari, M., Friedrich, I., . . . Zwißler, B. (2011). Deutsch-Österreichische S3-Leitlinie 'Infarktbedingter kardiogener Schock – Diagnose, Monitoring und Therapie'. *Der Kardiologe*, *5*, 166–224.

Wright, A. L., Zammuto, R. F., & Liesch, P. W. (2017). Maintaining the values of a profession: Institutional work and moral emotions in the emergency department. *Academy of Management Journal*, *60*, 200–237.

Xu, R., Carty, M. J., Orgill, D. P., Lipsitz, S. R., & Duclos, A. (2013). The teaming curve: A longitudinal study of the influence of surgical team familiarity on operative time. *Annals of Surgery*, *258*, 953–957.

Zeitz, G., Mittal, V., & McAulay, B. (1999). Distinguishing adoption and entrenchment of management practices: A framework for analysis. *Organization Studies*, *20*, 741–776.

Zimmerman, D. H. (1970). The practicalities of rule use. In J. D. Douglas (Ed.), *Understanding everyday life: Toward the reconstruction of sociological knowledge*. Chicago: Aldine Publishing.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, *13*, 339–351.

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