

The Mutation of Professionalism as a Contested Diffusion Process: Clinical Guidelines as Carriers of Institutional Change in Medicine

Paul S. Adler and Seok-Woo Kwon

University of Southern California; Temple University, Philadelphia

ABSTRACT The Anglo-American institution of the profession is mutating: we propose to analyse this mutation as a contested diffusion process that spreads new organizing practices among professionals. We offer an integrated account of the roles played in this diffusion/mutation process by facilitating and impeding factors at three levels: individual professionals (their autonomy, expertise, values, identities, and ties), professional organizations (their strategies, structures, cultures, skills, and systems), and the broader institutional field (professional associations, accountability demands, and competition). At the occupational and organizational level, we show how the distinctive and evolving features of professionalism moderate the mechanisms found in prior research on diffusion in other, non-professional settings; and at the field level, we show how field-level forces moderate the impact of professionalism on these diffusion dynamics. Changes at each of these levels interact with changes at the others, with influences flowing both downward and upward. We ground and illustrate this theoretical synthesis with evidence from the case of clinical guidelines as carriers of institutional change in the medical profession.

Keywords: carriers, clinical guidelines, diffusion, institutional change, professional organization, professionals

INTRODUCTION

A growing literature suggests that the Anglo-American institution of professionalism – understood both as type of occupation (‘the profession’) and as type of individual work identity (‘the professional’) – is in the process of a profound and contested mutation. The professions’ traditional autonomy and collegial control are increasingly being challenged by the growing pressures of market competition and hierarchical accountability (Brint, 1994; Broadbent and Laughlin, 2002; Freidson, 2001; Muzio et al., 2008). Under these pressures, professional organizations are increasingly moving towards an efficiency logic

Address for reprints: Paul S. Adler, Department of Management and Organization, Marshall School of Business, University of Southern California, Los Angeles, CA 90089-0808, USA (padler@usc.edu).

and business structure (Brock et al., 1999; Cooper et al., 1996; Cooper and Robson, 2006). Professionals themselves are divided, with some supporting, some acquiescing to, and others resisting these changes.

We propose a conceptual model in which the mutation of professionalism is theorized as a diffusion process – more specifically, as the contested diffusion of new organizing practices among professionals. Two considerations suggest that this approach promises valuable insights. First, we can leverage a large body of research on diffusion (described below). Second, we can leverage the fact that, as Scott (2008) argues, professionals are ‘the most influential, contemporary crafters of institutions’. Organizational research has shown that the proportion of professionals in an organization is a powerful predictor of innovation adoption (Damanpour, 1991; Pierce and Delbecq, 1977), and a considerable body of institutional research has shown that professions exert normative and mimetic pressures on organizations to adopt new practices (e.g. DiMaggio and Powell, 1983, 1991; Tolbert and Zucker, 1983). The strategy of the present paper is therefore to identify the ways in which the antecedents of diffusion that have been found in other, non-professional settings are moderated by the distinctive features professionalism inherited from the past, and how these inherited features are changed by forces inside and outside the professions themselves.

To date, research on the mutation of professionalism has identified various technical-economic and institutional forces enabling and resisting change at the level of the individual professional (e.g. Bain, 2007), the professional organization (e.g. Vigoda et al., 2006), and the broader institutional field (e.g. Mechanic, 1996); to the best of our knowledge, however, scholars have not articulated a model that integrates all three of these levels of aggregation. It is nevertheless clear that our understanding of this mutation process will benefit from such integration: the various forces that encourage and discourage change at each of these levels are influenced by and in turn influence the forces at the other levels. Focusing on any one of these levels alone risks misplacing causality.

To illustrate and ground our argument, we focus on the medical profession, where physicians’ traditional professional autonomy is being challenged by intensified market competition and by the bureaucratization of service delivery and systematized process improvement (Audet et al., 2005; Hackbarth, 2005; Lohr, 1995; Panush, 1995; Robinson, 1999; Scott et al., 2000). In the mutation of the medical profession, the diffusion of clinical guidelines has played a key role: guidelines replace physicians’ traditional decision-making autonomy with procedural rules; they formalize and standardize key elements of professional practice that were tacit and learned only through long apprenticeship; many formalize and standardize not only doctors’ tasks, but also the management of interdependencies between doctors and other actors in healthcare delivery; they often codify policies designed to reduce costs rather than improve quality; and they open the door to making doctors accountable to non-doctors. These guidelines can thus be seen as ‘carriers’ (Scott, 2008) of the profession’s institutional mutation.

In developing our integrated model, we have sought to include insights from studies of a broad range of relatively professionalized occupations and organizations, and from studies of the diffusion of a broad range of innovations. Our focus is on the American context, where (as in the UK, but unlike continental Europe) occupations are typically institutionalized as professions to the extent that the state authorizes monopoly powers

for the occupation to set fees, to impose advanced training requirements and some form of certification, and to assume responsibility for the outcomes of the services offered (Abbott, 1988). Given the institutional similarities between the healthcare systems of the USA and the UK, our illustrative material on guidelines has been informed by scholarship on both countries; however, given the institutional differences between the two, our main focus will be on the USA.

In each of the sections in the body of the paper, we leverage this prior research to formulate some general propositions about the diffusion of innovations among professionals in general and we discuss these propositions' implications for the diffusion of clinical guidelines and for the resulting mutation of the medical profession. First, however, we offer some background on clinical guidelines and on the prior research on diffusion.

CLINICAL GUIDELINES

Clinical guidelines can be defined as 'systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances' (Institute of Medicine, 1990). Terminology is not fixed, and guidelines are sometimes referred to as 'clinical standards', 'clinical recommendations', 'clinical protocols', 'clinical policies', 'clinical algorithms', 'practice parameters', 'clinical pathways', and 'practice options'. Some guidelines are based on randomized clinical trials; others are based on process statistics applied to observational data on practice/outcome patterns (see materials at <http://www.cochrane.org>).

These guidelines are artefacts that embody many features of the mutation of the medical profession that is currently underway. Scott (2008) identifies four types of carriers that can transmit institutional change – symbolic systems, relational systems, routines, and artefacts. All four types of carriers are implicated in the transformation of medicine, but guidelines are particularly potent. They act as 'disease vectors', transmitting the institutional mutation into new settings via the associated changes in regulative regimes, in normative models of doctors' duties, and in cultural–cognitive scripts for how doctors perform those duties. Not surprisingly, there is a vast and growing literature on the where, why, and how of guideline diffusion, and in particular on the inadequate diffusion of numerous clinical guidelines that have a strong evidence-base (e.g. Cabana et al., 1999) and several well-proven drug therapies (e.g. Dopson and Fitzgerald, 2005; Ferlie et al., 2005). Examples range from treatments for head and neck cancer (Fennell and Warnecke, 1988), to operative fracture treatment with metal implants (Schlich, 2002), the use of aspirin to prevent secondary cardiac incidents, and the use of echocardiography for patients with heart failure (Dopson and Fitzgerald, 2005).

Guidelines promise great improvement in the quality and cost of care (Woolf et al., 1999). They have therefore been championed by powerful actors both outside the medical profession (e.g. National Guideline Clearinghouse sponsored by the US Agency for Healthcare Research and Quality) and within it (e.g. Berwick and Nolan, 1998). On the other hand, insofar as guidelines represent a shift away from the traditional autonomy of the individual doctor, and a shift towards the bureaucratic and commercial control of medical activity, it is hardly surprising that their diffusion has attracted not

only support but also eloquent opposition (e.g. Panush, 1995) as well as quiet resistance (see, e.g. Ferlie et al., 2005). Criticisms have been motivated by both political-economy (Rappolt, 1997) and humanist concerns (Tanenbaum, 1994) (for a review of these two perspectives, see Mykhalovskiy and Weir, 2004). Hence, guidelines provide a window into the process of institutional mutation viewed as a contested diffusion process.

DIFFUSION

In this paper, we use the term diffusion in a broad sense: to refer to the pattern of adoption and implementation over time and to refer to whether this pattern results from the unplanned, horizontal transmission among peers – which is the most common focus of the literature on the diffusion of innovations – or from the hierarchically mandated adoption and implementation that is often a feature of spread within formal organizations. In the context of the diffusion of clinical guidelines, which is the focus of this paper, we focus on individual physicians' guideline adoption decisions.

Our model development leverages the findings of the general literature on the diffusion of innovations (Rogers, 2003) and a growing stream of work on diffusion among actors within organizations (e.g. Cool et al., 1997; Leonard-Barton, 1990; Szulanski, 1996). A particularly active subset of this work has been on diffusion within multinational corporations (see, e.g. Ghoshal and Bartlett, 1988; Gupta and Govindarajan, 2000; Kostova, 1999; Zander and Kogut, 1995). This research on the organizational context of diffusion has built on theories of learning and knowledge management (e.g. Argote, 1999; Argote et al., 2003; Davenport and Prusak, 1998; O'Dell and Grayson, 1998), theories of psychological processes at the individual level (Argote et al., 2000), social network theory (Borgatti and Cross, 2003; Hansen, 1999), communication theory (Szulanski, 2003), neo-institutional theory, and social movement theory (Strang and Soule, 1998). We should also note a stream of more micro, processual research exploring how diffusion, viewed from much closer up, typically involves some degree of adaptation (Ansari et al., 2010), reinvention (Rice and Rogers, 1980), or 'translation' (Callon, 1986; Czarniawska and Joerges, 1996; Sahlin and Wedlin, 2008).

A synthesis of research on diffusion among actors and implementation within organizations is necessary for studying diffusions among professionals because so many professionals now work within larger organizations rather than as solo practitioners or in small partnerships (Leicht and Fennell, 1997). In this context, adoption decisions are influenced by 'horizontal' relations with peers outside the organization, horizontal relations with peers within the organization, vertical relations with those in authority within the organization, as well as inter-organizational networks linking professionals across organizations (Ferlie, 2010). The dynamics of diffusion and implementation are thus deeply intertwined.

We argue that the diffusion of clinical guidelines in medicine and the associated mutation of the medical profession are driven by both technical/economic and institutional factors. The former have been the focus of the economics literature, and explain adoption insofar as it is motivated by technical or efficiency gains (Mansfield, 1993; Rogers, 2003). The latter have been the focus of the sociological literature, and emphasize the social embeddedness of adopting individuals and organizations (Baron et al.,

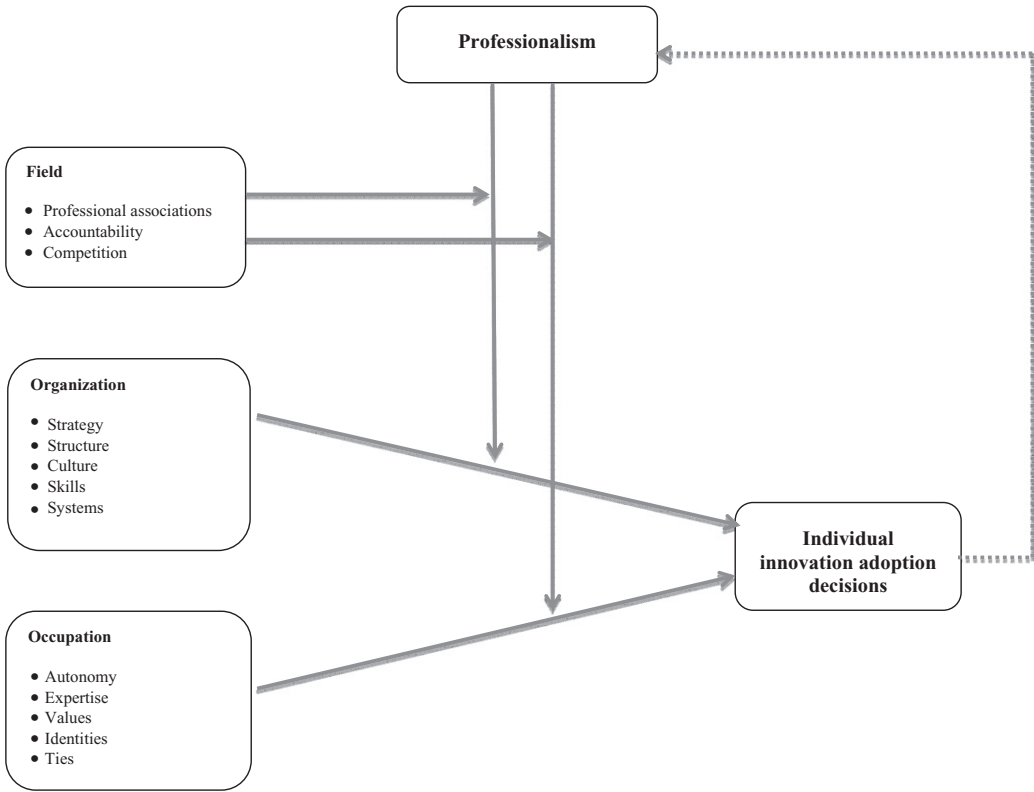


Figure 1. Conceptual model

1986; DiMaggio and Powell, 1983; Westphal et al., 1997): these diffusion pressures contribute to isomorphism and conformity to ‘rationalized myths’ in society about what constitutes proper organizational practices (Meyer and Rowan, 1977).

Our integrated theoretical model is presented in Figure 1, and the following sections address in turn each of its three levels. In each section, we develop some propositions concerning the diffusion of innovations in general and discuss their implications for the diffusion of clinical guidelines in particular and for the resulting mutation of the medical profession. In the course of this exposition, we will also identify various top-down processes by which higher levels influence lower ones and thereby indirectly influence individual innovation adoption decisions, and we will identify various bottom-up processes by which lower levels influence higher ones and thereby also indirectly influence diffusion.

INDIVIDUAL PROFESSIONALS

Professional occupations are distinctive in their autonomy, expertise, values, identity, and ties (Adler et al., 2008). We follow prior research in seeing a continuum along which occupations can be arrayed by degree of professionalization as a function of these

features (see Moore, 1970). Doctors, lawyers, and scientists for example are at the high end of this continuum; towards the middle are categories such as engineers, nurses, schoolteachers, and librarians that are sometimes referred to 'semi-professions' (Etzioni, 1969) along with trades and crafts; and mundane occupations that rank low on all the key dimensions anchor the low end of this spectrum.

These features of professional occupations have important effects on individual innovation adoption decisions, including the diffusion of new organizing practices that serve as carriers of professionalism's mutation. We discuss each in turn in the paragraphs below. Our aim is to show how the antecedents of diffusion that have been documented in prior research are moderated by the degree of professionalism of an individual's occupation: namely, the higher the degree of professionalism in an occupation, the stronger the effect of the antecedents on diffusion.

Autonomy

Professionals enjoy considerable autonomy and freedom from external control, both in the governance of the profession as a whole (occupational control) and in the individual professional's daily conduct (technical control) (Pettigrew et al., 1992). These two aspects are distinct but related. For the professional occupation, autonomy is the ability to establish, monitor, and enforce its own membership criteria and work standards. In the Anglo-American context, this entails special legal privileges – in effect, a state-sanctioned monopoly, expressed in a license or charter, and codified as an exception to anti-trust law (now eroding: see Greaney, 2002, and discussion below): the state thus plays a critical role in the constitution of the professions (Freidson, 2001). As a result, and in contradistinction to the model of pure and perfect competition, the market for professional services is characterized by occupational closure (Larson, 1977) with high, institutionalized barriers to entry, and with professions regulating their own members' behaviour.

Autonomy at the individual level involves the right to decide what kind of work is to be done and how, without bureaucratic or commercial interference. In the case of US medicine, this is codified in the legal doctrine banning the 'corporate practice of medicine' – now more honoured in the breach than in the observance (Robinson, 1999). Notwithstanding considerable variation along this dimension, professionals, even when they are salaried employees rather than self-employed, typically enjoy more autonomy than other employees in bureaucratic and business organizations (Wallace, 1995). In practice, professionals have historically resisted both output controls and process controls even when these controls are exercised by peers. The traditional autonomy of the professional relies primarily on input controls, such as restricting access to the profession to graduates of accredited institutions (Mintzberg, 1979).

Their autonomy gives professionals considerable influence over the diffusion of innovations. Professionals' autonomy from commercial pressures allows them to adopt innovations that fit the professional's values regardless of economic considerations. It also allows professionals to impede the diffusion of innovations they oppose for any reason. Professionals also enjoy autonomy from the authority mechanisms to which non-professionals are subject, and this allows them to adopt innovations that are to their private advantage and to society's detriment, or innovations that are to their clients'

advantage but to the detriment of other social sectors. For example, whereas a CEO can order the immediate replacement of obsolete office or factory equipment, the CEO of an American hospital has much less power to force doctors to adopt electronic prescription systems – even though it is well-established that such systems could eliminate difficulties caused by the illegibility of a doctor's handwriting, and could automatically check for possible adverse reactions with other medications that a patient is currently taking (Mundinger et al., 2000). In sum:

Proposition 1: The more professionalized the individual actors' occupations, the more their individual innovation adoption decisions reflect their individual preferences rather than the preferences of other actors.

The implications for the diffusion of guidelines are straightforward: insofar as doctors see guidelines as contrary to their individual preferences, diffusion will be constrained and the associated institutional mutation will be impeded. The forces driving guideline diffusion will need to either overcome this resistance or bring professionals around to seeing guideline adoption as consistent with their professional autonomy.

Expertise

The structural autonomy of professionals both reflects and reinforces their distinctive expertise. The esoteric nature of both their theoretical knowledge and their practical knowledge justifies and enables the autonomy of the professional. In turn, professionals often use their autonomy to preserve their exclusive control over these bodies of knowledge (Larson, 1977).

The extent to which an innovation diffuses depends critically on its relationship to the expertise of the potential adopters. The general literature on diffusion has highlighted several dimensions of this interaction, most notably, complexity, trialability, observability, relative advantage, and compatibility (Rogers, 2003). Subsequent research has highlighted the role of uncertain imitability due to causal ambiguity (Lippman and Rumelt, 1982; Szulanski et al., 2004) and whether the innovation is characterized by increasing returns (2004). The literature on diffusion among professionals confirms the importance found elsewhere of such innovation characteristics (Becker, 1970; Greenhalgh et al., 2004; Kaluzny, 1974).

The literature on the diffusion of clinical guidelines echoes these general findings. Grilli and Lomas (1994) found that guidelines with relatively higher complexity had lower adoption rates, and those judged by doctors to be higher on trialability and observability had higher compliance rates. (For further evidence of the importance of these characteristics in the diffusion of other healthcare innovations, see Denis et al., 2002; Gagliardi et al., 2011; Greenhalgh et al., 2004; Meyer et al., 1997; Øvretveit et al., 2002.) Observability and codification too have powerful effects. Anaesthesiology is one medical discipline that has codified a relatively high proportion of its core knowledge, and this codification has stimulated the diffusion of quality-related innovations (Gawande, 1999a). Similarly, oncology relies to a relatively great extent on codified

treatment protocols, and new treatments therefore diffuse faster here than in specialties where knowledge is more tacit (Löwy, 1996).

These characteristics, however, only affect diffusion by virtue of their relation to the potential adopters' absorptive capacity (Cohen and Levinthal, 1990), and on this dimension, professionals' expertise plays a critical role in two key ways. First, professionals' knowledge-bases are more theorized than those of other occupations, and this gives professions relatively greater absorptive capacity (Strang and Soule, 1998). As a result, articles in scientific journals can often convince physicians of the value of a new medication. Similarly, lawyers rapidly absorb the import of newly published laws and rulings by virtue of the theorized nature of their knowledge-base. On the other hand, the diffusion literature documents the relative difficulty of diffusing administrative and managerial innovations among professionals because these innovations are not grounded in their profession's theory-base (e.g. Boerstler et al., 1996). For example, Jonsson (2009) attributes the slow diffusion of Index and SRI funds in the Swedish mutual fund industry to the resistance of finance professionals in the industry who saw these funds as a challenge to a core assumption of their theory-base: namely, the value of active asset management. Professionals are more welcoming of innovations that are compatible with the profession's theory-base. Generalizing:

Proposition 2: The more professionalized the individual actors' occupations, the more their individual innovation adoption decisions depend on the compatibility of the innovation with their individual knowledge-base.

Given this, we expect clinical guidelines to diffuse to a greater extent if they are compatible with doctors' current theory-base. In this respect, the diffusion pattern of guidelines will differ depending on whether the guidelines derive their rationale from observational studies and process statistics or from randomized control trials (RCTs) (on the factors that contribute to or detract from the quality of guidelines based these two types, see Guyatt et al., 2006). The former relies on a branch of statistics to which many doctors have not been exposed. Medical school training typically emphasizes classical statistical inference from 'gold standard' trials with random assignment of patients to the control group given a placebo compared to the subject group given the treatment. Doctors without training in observational studies distrust guidelines bases on process statistics (Greer, 1987); we expect this type of guideline to diffuse only slowly.

Professionals' expertise, however, is not only based in theory; it is also deeply practical and tacit. According to Morris (1999), only 10–20 per cent of the diagnosis and treatment decisions made by the typical physician are based on theory – notwithstanding the fact that contemporary medicine has a theoretical base that is relatively elaborate compared to most other professions. (For example, Rosen et al. (1995) estimate that less than 1 per cent of practice decisions made by social workers were justified by reference to scientific findings.) A much larger proportion of medical decisions are informed by practical experience rather than by scientific knowledge. Law too relies to a considerable extent on a 'craft' type of knowledge (Scharffs, 2001). Consistent with the importance of practical knowledge, professions typically require both extended formal training and lengthy

apprenticeships that together inculcate both skills and identities. Prototypical in this regard are the combination of medical school and residencies, and the combination of graduate school and the obligatory period as a non-partner 'associate' in law and accounting firms (Middlehurst and Kennie, 1997).

Reliance on tacit knowledge limits the diffusion of new professional practices. Many practices are learned at the cost of considerable personal effort, and they are often characterized by great causal ambiguity. Professionals may not know why a given technique works, but they have invested long experience in acquiring it, and their experience has confirmed in their minds that it works. Changing these tacitly grounded practices is thus very difficult unless innovation senders and champions can show compelling evidence of the innovation's superiority. Thus:

Proposition 3: The more professionalized the individual actors' occupations, the more their individual innovation adoption decisions depend on the compatibility of the innovation with their established practice patterns.

Since clinical guidelines are often incompatible with doctors' current practice patterns, we expect them to diffuse slowly, and we expect this factor to constrain the mutation of the medical profession. The voluminous literature on the poor efficacy of various techniques for changing physician behaviour or for encouraging the adoption of guidelines is eloquent in this regard (see a review by Grimshaw et al., 2001). The inertia created by the tacitness of professional practice knowledge helps explain the well-documented failures of professional Continuing Education programmes to change physician behaviour (Smith, 2000). Requirements for continuing education are part of the institutional *quid pro quo* between profession and state. These requirements are one way of buttressing the institutional sources of the trust that professionals enjoy (Zucker, 1986); in practice, Continuing Education is a poor mechanism for diffusing new ideas other than those that are highly compatible with existing practice and those that are strongly grounded in the profession's theory-base.

Values

While business organizations are assumed to pursue their material self-interest, the professions claim higher ethical goals. Parsons (1939) characterized professional work as universalistic, rational, and altruistic. He argued that professionals assume a 'moral responsibility' in an otherwise largely 'acquisitive society'. Brint (1994) argues that professionals were long distinctive in their function as 'social trustees', although recently they have tended to degenerate into mere experts for hire.

The regulative bargain by which the state accords the profession its monopoly entails a corresponding commitment to the elaboration and enforcement of a professional code of conduct and the internalization of professional standards of work. The professional code of ethics prohibits professionals from taking advantage of the 'ignorant public'. In all situations the clients' interests should be paramount and take precedence over the professional's personal or commercial interests; Parsons (1939) calls this 'disinterestedness in the professional-client relationship'. The rhetoric of disinterestedness is certainly

pervasive, even if the reality is far more mixed (Freidson, 1970), and these values should condition diffusion (see Denis et al., 2002). Thus:

Proposition 4: The more professionalized the individual actors' occupations, the more their individual innovation adoption decisions depend on the compatibility of the innovation with their own professional values.

Doctors in the USA have long been socialized to care about patient care quality – regardless of cost. This is a function of the protections the law affords medicine from anti-trust legislation, allowing doctors to collude in setting prices (Hellinger and Young, 2001) and to maintain a 'fee for service' payment model. This is slowly changing with the introduction of various kinds of capitation and performance-based pay for doctors; but as yet, the extent of change has been modest (Epstein, 2007). Therefore, we expect that clinical guidelines will be more widely diffused when doctors believe they focus on improving clinical quality than when doctors believe they focus on reducing costs. Insofar as the social trustee values of the medical profession remain influential, the diffusion of guidelines aimed at reducing costs at the expense of quality – and the associated mutation of the profession – will be constrained.

Identities

Their shared experience of extended training gives professionals a strong sense of identity. Their apprenticeship in an esoteric knowledge-base gives them a common language. Van Maanen and Barley (1984, p. 300) suggest that 'becoming a member of an occupation always entails learning a set of codes that can be used to construct meaningful interpretations of persons, events, and objects commonly encountered in the occupational world': this identity is stronger in more professionalized occupations, and continues to shape professionals' behaviour throughout their careers (Gouldner, 1957). These shared identities open professional occupations to the powerful effect of homophily (people's general preference for socially similar others) on diffusion (Lazarsfeld and Merton, 1982). Social similarity facilitates trust (Levin and Rao, 2004) and thus facilitates communication and diffusion (Kane et al., 2005), since socially similar actors are more likely to speak the same language and share the same knowledge and assumptions (Rogers, 2003).

Homophily can encourage or discourage diffusion because it facilitates communication of richer information about the innovation's merits or limitations (Brown and Duguid, 1991). It can also enhance mimetic effects, and these mimetic effects can further encourage or discourage diffusion. Social psychology teaches us that people generally will be more receptive to ideas generated and used by members of their own community than they are to ideas from other communities (see also O'Neill et al., 1998). Neo-institutional theorists make a similar point: where actors see themselves as belonging to the same cultural category, diffusion among them should be more rapid (Strang and Soule, 1998). Burt (1987) argues that diffusion can also be stimulated by the rivalry experienced by actors who see themselves as similar insofar as they occupy structurally similar network locations. These factors all condition diffusion, and leave professionals at

greater risk of fad and bandwagon effects (Abrahamson and Rosenkopf, 1993). These mimetic effects are sometimes reinforced by the law: in many malpractice cases, professionals' best legal defence is that their decision was consistent with established practice (see King, 1986, on medicine). Thus:

Proposition 5: The more professionalized the individual actors' occupations, the more their individual innovation adoption decisions depend on whether the innovation has already been adopted by peers in their occupation.

This reasoning suggests that doctors' use or rejection of clinical guidelines will be influenced by the choices of their colleagues. Given the various forces discussed above that lean in the direction of rejection, homophily effects are likely to slow guidelines' diffusion at least until some critical mass of adopters has been reached, at which point it will accelerate (generating the commonly encountered S-curve of diffusion). The medical profession may well be approaching this critical mass.

Identity influences diffusion via the effects not only of peers but also of rivals. Since professions establish occupational closure over their task areas in order to protect their control over valued work processes (Larson, 1977), professions fiercely guard their core tasks and jurisdictional domains from potential incursions by competitors (Halpern, 1992). Professionals' strong occupational identity thus also creates boundaries that impede communication with other categories and impedes diffusion across these boundaries (Ferlie et al., 2005). For example, a doctor's use of clinical guidelines will be relatively unaffected by the use choices of doctors in other specialties or of non-doctors.

However, many innovations occur at the boundaries between disciplines or specializations (Leonard-Barton, 1995) and these innovations often trigger inter-professional jurisdiction disputes and competition. For example, Barley (1986) found that the introduction of CT scanners into hospital radiology departments prompted inter-professional conflict and subsequently changed the task areas of radiologists and technologists. When an innovation is seen as profitable and beneficial to rival professions, this rivalry may generate a diffusion race. Zetka (2001) documents how the introduction of laparoscopy set off a boundary conflict between gastroenterologists and surgeons. Seeing the potential market opened up by the new technology and competition from gastroenterologists, surgeons quickly embraced the new technology and argued that their particular skills better equipped them to deliver successful outcomes with it. Consequently, the technology quickly diffused among the surgeons even though imprudent adoption by inexperienced surgeons led to high complication rates (Deziel et al., 1993). Generalizing:

Proposition 6: The more professionalized the individual actors' occupations, the more their individual innovation adoption decisions depend on whether adoption of the innovation appears to be affording peers from rival subspecialties jurisdictional advantage.

Clinical guidelines are sometimes swept along in this rivalrous diffusion race. For instance, inter-specialty rivalries between dermatologists and plastic surgeons over

liposuction contributed to the increasing popularity (and sometimes overuse) of liposuction guidelines in the USA (Coleman, 1999). In this way, rivalry, like values and homophily, may contribute to the mutation of the medical profession.

Ties to Critical Roles

The diffusion literature suggests that diffusion is a function of the ties between the potential adopter and actors in several key roles: champions, opinion leaders, and boundary-spanners. (Insofar as we include mandated adoption as part of our expansive concept of diffusion, we should add organizational policy-makers: we discuss them in the section below.) Several considerations suggest that these ties are even more important for diffusion among professionals. First, as discussed above, professionals are less likely to adopt a new practice because directed to do so by management (McLaughlin and Kaluzny, 1990); the influence of fellow professionals is therefore relatively more critical (Fitzgerald et al., 2002). Second, to the extent that professionals' tasks are often relatively uncertain in their cause-effect relations, these innovations' merits may be difficult to ascertain, and diffusion is therefore often dependent on support from champions and opinion-leaders who enjoy prestige, legitimacy, or credibility among their peers (Berwick and Nolan, 1998; Locock et al., 2001). As a result, physicians are more likely to adopt guidelines proposed by peers whom they recognize as experts in their own professional societies than guidelines propounded by other professions, government agencies, or insurance companies (Tunis et al., 1994). By the same token, negative assessments of an innovation by opinion leaders within the professional community will have unusually powerful effects limiting the extent of diffusion.

Boundary-spanners and 'institutional entrepreneurs' (Maguire et al., 2004) also play particularly important roles in diffusion among professionals. In large measure that is because (as discussed above) professional occupations rely on relatively theoretical forms of knowledge as distinct from exclusively practical ones. Much of the development of this theoretical knowledge happens in specialized researcher roles and in specialized organizations such as universities and research laboratories. Rank-and-file professionals are thus constantly challenged to keep up with the growing stock of theoretical knowledge in their fields, and credible champions, opinion leaders, and boundary-spanners are crucial in that regard. To illustrate: a physician must absorb knowledge about innovations in medical equipment, pharmaceuticals, and clinical research. The rate of arrival of this new knowledge exceeds the processing capacity of any one professional (Eve and Hodgkin, 1997). Trusted peers in these key roles within the profession are therefore crucial in orienting professionals towards the most important information (as found by Coleman et al., 1966).

Proposition 7: The more professionalized the individual actors' occupations, the more their individual innovation adoption decisions depend on whether the innovation has been endorsed by peers in key diffusion roles.

The key implication of this proposition for diffusion/mutation in medicine lies in its implications for those who seek most actively to accelerate or impede the process: these

activists will be most effective when they target their influence efforts at professionals in these key roles (Berwick, 2003; Shortell et al., 1998).

PROFESSIONAL ORGANIZATIONS

Although there is a considerable body of research on diffusion among professionals, relatively little of it has attended to the organizational context of professional work. This gap has become an increasingly troublesome blind spot with the growth in the proportion of professionals working in organizations rather than as independent, self-employed solo practitioners. It is this blind spot that we address in the present section. Our goal is to understand both the factors that lead professional organizations to adopt innovations (especially innovative organizing practices like guidelines) and the organizational factors that lead individual professionals within those settings to implement these innovations. The factors we identify in this section thus affect diffusion both directly and indirectly through their effects on the factors discussed in the previous section. Conversely however, we must simultaneously remain mindful of the bottom-up processes by which individuals can sometimes reshape organizations and their policies.

Organizations, like occupations, can be arrayed from more to less professionalized, depending on the overall influence of highly professionalized occupations within the organization. Here the spectrum conventionally differentiates 'autonomous' professional organizations such as law firms, medical groups, and accounting firms at the high end, 'heteronomous' professional organizations such as engineering departments within bureaucratically structured occupations in the middle of the spectrum, and conventional wage-based employment work organizations at the low end of the spectrum (Scott, 1982).

The previous section identified several features of professionals that help explain the likelihood of innovation diffusion among them and the corresponding prospects for the mutation of professionalism. We might expect that the impediments to diffusion we noted above could be mitigated by bringing professionals into formal organizations; in reality, however, diffusion hurdles are just as often raised as lowered by the specific features of professional organizations. Prior research has identified several such features. We briefly discuss these features before turning, in the sections below, to the specific dimensions of organization design that determine the likelihood of diffusion/mutation.

Within professional organizations, and consistent with the norm of professional autonomy, order is typically negotiated rather than imposed, and the role of hierarchical superiors is typically advisory rather than decisional (Goss, 1961). This leads to three distinctive features of professional organizations. First, in response to the relative uncertainty of professional tasks and to professionals' demand for autonomy, managers often allow professionals to define their own work roles. To a greater extent than other employees in formal organizations, professionals negotiate their roles, rather than fitting predefined roles (Strauss et al., 1963). The division of labour thus tends to be spontaneous and emergent rather than mandated, and internal differentiation tends to be around clusters of professionals who compete for recognition by their peers and by the administrative structure. Second, there is often considerable competition for resources within professional organizations, and this competition is managed through an overtly political

process in contrast with the relatively covert nature of politics in bureaucracies (Bucher and Stelling, 1969). Third, the locus of power and decision-making tends to shift relatively fluidly, since political processes play out through professional committee structures (Bucher and Stelling, 1969), which are the seat of authority vis-à-vis professional actors in the organization. Not only is the structure of professional organizations relatively negotiated and advisory, but it is also relatively complex – ‘the most elaborate and intricate organizational arrangements yet devised’ (Scott, 1991, p. 253). The basic reason for this complexity is that the administration of a professional organization is usually partitioned to reflect the differences in autonomy of its constituent groups. The more professionalized the occupation, the greater is the tendency for professionals to ‘report to’ (insofar as they report to anyone at all) other professional peers. All three of these features of professional organizations strengthen individual professionals’ capacity for bottom-up influence over the organization.

These organizational features condition diffusion dynamics (e.g. Cool et al., 1997; Duckers et al., 2011; Szulanski, 1996). In the paragraphs below, we synthesize available research on the main dimensions of organizations that affect diffusion – strategy, structure, culture, skills, and systems (adapting Adler et al., 2003; Shortell et al., 1995) – and draw some inferences for the dynamics of the mutation of the medical profession. As in the previous section, our conceptual strategy is to explain how the antecedents of diffusion across organizations that have been documented in prior research are moderated by the degree of professionalism of the organization.

Strategy

The diffusion of innovations within organizations often requires a strategic commitment (Young et al., 1997). Faced with innovations that spontaneously might diffuse too far or fast, some organizations put in place strategic controls, for example requiring pre-authorization for expensive medical procedures. Conversely, faced with innovations that are likely to diffuse too slowly without supporting and complementary investments, some organizations give strategic priority to the requisite capital investments (e.g. CT scanners or MRI) and organizational realignments (e.g. creating specialized technical support functions) (see Gustafson et al., 2003; Hughes et al., 2002). Gustafson et al. (2003) found that innovations are more likely to diffuse widely within hospitals if supported by a budget that is both adequate and continuing. Naveh et al. (2005) found that innovations designed to capture and disseminate information about medical errors reduced the incidence of medical errors only when hospital managers set safety as a strategic priority.

Professional organizations, like other types, can accelerate internal diffusion through both more and less active forms of strategic commitments. On the less-active end of the continuum, organizations can financially or symbolically reward those who contribute to diffusion. On the more-active end of the continuum, support for diffusion can take the form of deliberate planning, formal appointment of diffusion champions (as discussed in Proposition 7), formal organizational communication, and appropriate budget allocations. These strategic choices by professional organizations encourage individual professionals to adopt innovations by reducing the costs of trying them out and increasing the

potential advantages of adoption relative to the costs, thereby enhancing the innovations' compatibility with the professionals' knowledge-bases (Proposition 2) and practice-patterns (Proposition 3).

Professional organizations, however, experience distinctive difficulties in formulating and implementing such strategies. For example, Greenwood et al. (1990) found that in professional organizations, compared to corporations where professionals play a less influential role, 'there is less strategic analysis of opportunities and threats, less explicit and formal forecasting and planning of future options and directions, and less codification of analysis in these [professional] partnerships'. One key factor making strategic commitment difficult in professional organizations is the limited managerial authority over professionals, a direct consequence of the negotiated order and structural complexity features discussed above, and of the autonomy discussed in the previous section. In the autonomous type of professional organization, such as in law firms and medical groups, the strategy process must forge a consensus of all the partners. In more complex organizations such as hospitals, there is the further challenge of reaching consensus among the multiple professional specialties and between the professional staff and the hospital leadership (Ferlie et al., 2005, p. 118). Not surprisingly, hospitals under performance pressure have recently sought to build stronger 'partnerships' with their physicians, attempting to involve them more actively in strategic (and operating) decisions (Zuckerman et al., 1998). Generalizing:

Proposition 8: The more professionalized the organization, the more the individual professional's innovation adoption decisions within it depend on the organization's strategic commitment.

We should expect that clinical guidelines would diffuse more widely in professional organizations that have developed a stronger strategic partnership with their medical staff. However, we should also expect that the achievement of a strategic commitment for the diffusion of clinical guidelines would be particularly difficult because professionals often see them as undermining their prerogatives.

Structure

Both horizontal and vertical dimensions of organizational structure can influence diffusion. Taking first the horizontal dimension: new ideas tend to spread more widely within group boundaries than across them, and the extent of intra-organizational diffusion thus depends on ties across units (Granovetter, 1973). Diffusion will be easier to assure where the organization's formal structure groups people effectively by degree of task interdependence and where it provides the integrative mechanisms needed to coordinate the ensemble of these groupings (Barnsley et al., 1998; Parchman et al., 2011; Thompson, 1967). The vertical dimension is important too: a considerable body of research (reviewed by Cotton et al., 1998) supports the intuition that the relative advantage, both real and perceived, of an innovation and the willingness to adopt the innovation will be greater when users have more opportunity to participate in the innovation's development, refinement, and implementation. A variety of organizational mechanisms can be

used to ensure these horizontal and vertical ties. In the hospital setting, for example, research has found that cross-boundary teamwork and cooperation are important determinants of Continuous Quality Improvement (CQI) success (Blumenthal and Kilo, 1998).

However, professional organizations experience distinctive challenges in assuring horizontal coordination. When professionals are grouped into departments by common practice area – as they are, for example, in large law firms, medical groups, and hospitals – commonalities of identity and language are further strengthened. Such groupings can help within-group diffusion because they provide opportunities for the face-to-face interactions needed to transfer tacit knowledge (Frank et al., 2004). These opportunities are particularly important when regional and national professional associations meet less frequently and when the innovations in question are local in origin. These groupings can, however, simultaneously impede diffusion across groups if the boundaries between these communities discourage learning from, or collaborating with, others (Ferlie et al., 2005). In analysing situations such as these, actor–network theory (Latour, 1987) stresses the role of coalitions across groups in the diffusion of innovations.

In professional organizations, vertical barriers created by employment and professional status often compound horizontal barriers to diffusion. First, the employment status of professionals varies along a spectrum: some are independent practitioners with ‘consulting’ type relations to the organization, as when independent physicians have ‘privileges’ to treat patients in US hospitals or lawyers are ‘of counsel’ to a law firm; some are partners in stand-alone professional partnerships; some are salaried employees. The ability of the organization to drive diffusion increases as we move along that spectrum. Committees and task forces are often used as mechanisms for ensuring coordination in the absence of formal authority relations (Young et al., 1998); in practice, however, such temporary organizational structures can be taken over for the defence of parochial prerogatives. Second, professionalization strengthens status differentiation (Abbott, 1981), and if actors from a lower-status profession attempt to promote an innovation in a multi-professional environment, we can predict that the probability of a successful diffusion will be low unless they can find a sympathetic and respected individual from a high-status profession to act as a champion (Cook, 1995). Doctors’ interactions with nurses, for example, are often marked by status distance, and endorsement by one may do little to encourage adoption by the other.

Both horizontal and vertical structuring thus affect the likelihood of diffusion among professionals in organizational settings by their effects on the professionals’ ties to others in critical roles. Generalizing:

Proposition 9: The more professionalized the organization, the more the individual professional’s innovation adoption decisions within it depend on whether critical horizontal and vertical communication flows are supported by organizational structure.

Given the strong horizontal and vertical partitions in healthcare delivery organizations, we should expect that proponents of guideline diffusion would encourage the

development of the appropriate bridging structures; but we should also expect that this bridging will prove difficult, and as a result, the mutation of the medical profession will be slowed.

Culture

Culture affects diffusion in organizations primarily through its effects on trust. Since the adoption of an innovation always involves at least some degree of risk, trust between the source and the recipient of the innovation and trust in the other relevant actors in the organization are required for diffusion (Szulanski et al., 2004). Trust in senior management will also affect diffusion within organizations, because such trust influences the legitimacy of strategic diffusion priorities. Conversely, one of the major impediments to internal knowledge transfer is an 'arduous' relationship between the source and the recipient – a relationship that is distant and/or difficult (Szulanski, 1995, 1996).

This trust factor is even more important, but also more difficult to assure, in professional contexts. Sharma (1997) points out that in these contexts, conventional principal–agent models of organization understate the problem caused by knowledge asymmetry. Here, trust is not merely a lubricant that reduces costly monitoring (as described by Arrow, 1974), but rather, an essential precondition for successful transactions both among professionals and between professionals and lay clients or managers (see also Gibbons, 2004). It is therefore not surprising that high-trust hospitals with interdisciplinary collaboration and participative, flexible, and risk-taking cultures are more successful at implementing CQI programmes (Shortell et al., 1995), and are able to demonstrate improvements more quickly (Boerstler et al., 1996). Trust, however, is particularly difficult to maintain within professional organizations, marked as they are by pervasive and acute knowledge asymmetries. Moreover, both within professions and across them, the mobility of the professional weakens the sense of 'shared fate' (Portes, 1998) with other members of the organization, which in turn further weakens trust. Trust will therefore condition the individual professional's adoption of the innovation by shaping their sense of identity and their willingness to share their individual autonomy with the organization. Generalizing:

Proposition 10: The more professionalized the organization, the more the individual professional's innovation adoption decisions within it depend on the extent of trust in the organizational culture.

Within healthcare delivery organizations, the diffusion of guidelines is likely to depend on trust to an even greater extent than is the case for other innovations in other settings. Guidelines represent a form of process control over the professional's work, and they therefore open the door to outsiders' influence. Unless professionals trust that these outsiders will not use this opportunity to attack their prerogatives or push their decision-making in directions antithetical to their preference, diffusion effort will falter. In reality, however, as we have seen, guidelines can easily be seen as a vehicle for precisely this

attack on professionals' prerogatives: we should therefore expect lack of trust to be common within professional organizations, and the diffusion/mutation process to be correspondingly constrained.

Skills

Innovations often require adopters to change established ways of doing things and to learn new skills. To support wide diffusion, organizations must provide training and education, both for the specific new skills required by a given innovation and for the competencies needed to participate widely in managing diffusion (Gustafson et al., 2003). Team-based training may be needed for organizationally complex technologies (Edmondson et al., 2001). Many innovations include both technical and managerial components (see Denis et al., 2002, on the 'soft periphery' versus 'hard core' of innovations), and potential adopters require training in both. Implementing an organization-wide CQI programme, for example, requires training in CQI philosophy, problem-solving, statistical thinking, statistical process control, employee involvement, team building, leadership/facilitation, outcomes measurement, competitive benchmarking, robust design, teaching/training, quality policy deployment, experimental design, meeting management, and project management (e.g. Crosby, 1996; Hutchins, 1999).

Whereas in less-professionalized organizations, the managerial skills needed for wide diffusion can be concentrated in management layers and staff functions, in professional organizations, such concentration creates organizational difficulties: given their autonomy, professionals are less likely to submit to bureaucratic authority or to recommendations from staff specialists. Thus, the diffusion of innovations – especially those that necessitate management changes or that integrate managerial and technical components – typically requires professional organizations to invest in the development of the management skills of the professional themselves. These skills are in areas such as strategy, finance, marketing, change management, communication, negotiation, conflict resolution, quality improvement, project planning, and project budgeting (Motwani et al., 1996). Building the professional's expertise in these areas reduces the incompatibility of the innovation with the professional's knowledge-base. Absent such investment, professional organizations risk conflict between academic and managerial elite on the one hand and rank-and-file practitioners on the other (Freidson, 1984).

However, among professionals, management skills are typically seen as less prestigious. As a result, there is rarely much enthusiasm for acquiring these skills, nor much support among professionals for investing organizational resources in training professionals to acquire them. Thus, diffusion of new practices in professional organizations is often hampered by insufficient investment in management education.

Proposition 11: The more professionalized the organization, the more the individual professional's individual innovation adoption decisions within it depend on the organization's investment in professionals' management education.

In the case of clinical guidelines, both the technical and the managerial components of the innovation are often contested: enthusiasm for training doctors to facilitate guidelines adoption is therefore likely to be correspondingly limited.

Systems

Well-designed information systems help the intra-organizational diffusion of innovations in two ways. First, they can help people find out about innovations in other parts of their organization (Anand et al., 1998). In the form of email and intranets, they can help establish and maintain relationships that can facilitate diffusion. Second, well-designed information systems can help capture performance data that are needed to assess the relative advantage of proposed innovations (Shortell et al., 1998). While simply having more access to performance data does not necessarily assure wide acceptance of innovations, it does play a facilitating role (Tiwana, 2002). Given their commitment to client service, professionals often insist on data concerning innovations' relative advantage before they are willing to consider adoption (see, for example, Bradley et al., 2001, on the importance of 'credible data feedback' in efforts to increase physicians' use of beta-blockers). Appropriately designed information systems can thus increase the likelihood of adoption by professionals by enhancing both their ties to critical roles and their expertise.

Professionals' influence over the diffusion process is reinforced by their influence over the investment in information technology infrastructure that is often required for the implementation of other innovations, and they can use this influence to accelerate (or block) that implementation. This takes us back to the strategy process and Proposition 8. Ideally, joint decision-making on systems design and implementation would facilitate diffusion efforts, but such a partnership is difficult to create and sustain given the power stakes.

Proposition 12: The more professionalized the organization, the more the individual professional's individual innovation adoption decisions within it depend on information systems support.

In the case of clinical guidelines, the relevant data on the innovation's relative advantage bear on the professional's own work and its outcomes: as a result, such data risk being perceived as a threat to the professionals' autonomy, and professionals often resist efforts to create such transparency. Conversely, if managers can assert control over the information systems infrastructure and automate the collection of some of these data, they may create the means by which to subordinate professional work to bureaucratic authority or to strengthen market incentives, and professionals may as a result find themselves deprofessionalized (Murphy, 1990). We should therefore expect that the diffusion of guidelines will involve considerable conflict over information systems choices, and the mutation of the medical professional will be constrained by the persistence of information systems that fit the traditional model of professionalism.

THE CHANGING INSTITUTIONAL FIELD

A considerable literature has shown a trend towards the progressive loss of autonomy of professionals under the growing pressure for accountability from the state, investors, insurers, and clients, and under the growing pressure of market competition from peers and rival occupations (see surveys in Adler et al., 2008; Brock et al., 1999). As collective actors in their respective institutional fields, professional associations have both accommodated and resisted these pressures: they are both vehicles by which the broader field affects professionals and professional organizations, and vehicles that afford individual professionals and professional organizations bottom-up influence in the evolution of the institution of professionalism and the surrounding field. In the following paragraphs, we sketch how these field-level forces work to transform the nature of professionalism through both their direct effects on the diffusion of new organizing practices and their indirect effects via their (contested) influence on the factors at the individual and organization levels that we have identified in the previous sections.

Professional Associations

Many occupations create associations for their members; in general, however, the more professionalized the occupation, the greater the occupational closure and therefore, in general, the stronger the association (Weeden, 2002). As highlighted by neo-institutional theory, these professional associations are therefore a key vector of normative and mimetic diffusion.

However, depending on the anticipated consequences of a given innovation, professional associations can support or oppose its diffusion. Guidelines illustrate that some professional associations, such as the American Society of Anesthesiologists, have been very proactive in developing and disseminating guidelines (Gawande, 1999b). Other professional associations have been more resistant: Timmermans (2008) shows how forensic medicine, protected by a legal mandate to investigate certain categories of suspicious death, shielded its practitioners from competitors and external criticism, thereby widely resisting the standardization of practices and the diffusion of guidelines.

Associations' roles in diffusion are shaped by both internal and external factors: this section addresses the former, and the following two sections the latter. Unfortunately, notwithstanding several studies of the internal structuring of professional associations, we lack general, comparative studies (useful starting points include Freidson, 2001; Greenwood et al., 2002; Kronus, 1976; Scott et al., 2000). The following arguments are therefore presented as plausible conjectures rather than strongly grounded propositions. We use the same subheadings as in the previous section, applying them here to the professional association rather than the professional's work organization.

Strategy. Associations can mobilize their members around shared priorities, and stronger associations, such as are typical in the professions, are more effective in doing so. These priorities can be technical, such as developing standards, or institutional, such as lobbying Congress concerning legislation (e.g. Akers, 1968). When associations seek to assure or block the diffusion of an innovation, the association's strong strategic commitment can

greatly enhance or undermine the attractiveness of the innovation in the eyes of its members. Associations can also create indirect pressure for or against diffusion via their effect on legislation and regulation.

Structure. The associations representing more professionalized occupations typically enjoy a degree of centralization that affords them greater staff expertise and unity of action, which in turn give them more influence vis-à-vis other actors in the field and over innovation diffusion among their members.

Culture. More professionalized occupations – and therefore their associations – typically enjoy relatively stronger cultures (more coherent, more specific). The content of these cultures' values, however, differs across associations: some, for example, are more 'civic' and others more self-regarding, with consequences for the support they offer to innovations that serve public rather than members' interests (Sullivan, 2005). Associations both reflect and shape the culture and values of the profession, and thereby condition diffusion dynamics.

Skills. Professional associations play a crucial role in diffusion through their influence on the skills of their members, both their initial training and their ongoing, continuing education. Initial training is perhaps the most powerful means at the disposal of an association for influencing diffusion; but it will only affect the graduates from the corresponding time period. As discussed above, Continuing Education is a weak mechanism for diffusion among established professionals.

Systems. The associations of more professionalized occupations have stronger systems for credentialing and sanctioning their members, and for disseminating information to members (e.g. newsletters, journals, electronic media). These regulative and informational systems are potentially powerful means for influencing diffusion (Taylor et al., 1996).

Proposition 13: Professional associations' strategy, structure, culture, skills, and systems moderate the impact of professionalism on the effect of occupation and organization on innovation diffusion.

The case of guidelines presents medical associations with some serious challenges. As we have seen, some guidelines are fully compatible with traditional professional norms, and indeed medical associations have long played a role in sponsoring such guidelines' development and diffusion. Many other guidelines, however, are corrosive of those norms, and we should expect associations to play a more complex role in regard to these. While we would expect associations initially to oppose such guidelines and refuse to support their development or diffusion, external forces that are bearing down on doctors, healthcare organizations, and the associations themselves may force associations to soften this opposition: we turn now to these external forces.

Accountability

As professionals and professional organizations become increasingly subject to the demands for accountability advanced by other non-professional actors, the autonomy of professionals over adoption decisions is eroded, and the adoption of new organizing practices – ones increasingly reflective of the interests of these other non-professional actors – is increasingly forced on professionals. The demands for accountability achieve traction through competitive, regulative, normative, and cultural–cognitive mechanisms: competitive through the growing market pressure (discussed below), regulative through government agencies' regulations and through private insurers' contractual provisions, normative through the spread of new legitimacy norms, and cultural–cognitive through habituation to new schemas and scripts.

Traditionally, innovations have diffused among professionals mainly through respected peers through mimetic and normative isomorphism. Because professional organizations rarely monitored closely individual physicians' actions, informal systems of accountability to peers and colleagues dominated in this traditional model. Professional associations supplemented this informal intra-professional accountability by propagating new practices through education and licensure standards, and by disciplining those who deviate from established standards (Emanuel and Emanuel, 1996; Gray, 1991; Starr, 1982). Physicians, for example, were rarely forced to respond to pressures from laymen, government, private insurers, or courts.

However, growing affluence and other macro-societal trends post-World War II led to an explosive growth in the access to and use of professional services. Government funded a sizeable part of this growth. As economic growth slowed after around 1970, pressures grew to limit government expenditures, to ration access to these services, and to rationalize their operations. On the other hand, increasing levels of education over this whole post-war period reduced somewhat the information asymmetries and status distance between professionals and their clients. The combination of these economic and cultural changes has given rise in recent decades to a broad demand by non-professionals for greater accountability of professionals to their clients and to agencies that can protect clients' interests. Professionals are under pressure to adopt new practices in both their core activities as well as in the associated performance evaluation, compensation, and management activities (Ryan and Thompson, 1998). The diffusion of innovations has become, as a result, less determined than in the past by compatibility with individual professionals' preferences, expertise, values, identities, or established ties.

Pressures of accountability are also pushing professional organizations to better control the interdependencies between professionals and other groups. Professional organizations are increasingly being challenged to improve cost and quality outcomes not only for their members' individual tasks but also for larger-scale processes to which the professionals are only one contributor among others. Doctors, for example, are under pressure to improve the reliability of the 'hand-off' of patients to staff in other occupations and other units (Bodenheimer et al., 1999). Multi-disciplinary professional practices are proliferating, as clients demand more integrated solutions (Lemieux-Charles and McGuire, 2006). These pressures challenge professional organizations to overcome the limitations reflected in Propositions 8–12.

These accountability pressures bear on professional associations too. As Abbott (1988, pp. 153–54) writes, when professionals move from autonomous, dispersed solo and small practices into bureaucratically structured multi-professional settings, professional associations lose power to those bureaucracies. Moreover, legal challenges to the monopoly privileges traditionally accorded professions have weakened the role of the professional associations, most notably in the legal profession itself. Demands for greater accountability to external stakeholders have also weakened the self-regulation of the accounting profession (US Securities and Exchange Commission, 2003). Specialization has led to the fragmentation of umbrella associations such as the American Medical Association (Scott et al., 2000, pp. 178–80). It is difficult to see how under these conditions professional associations can play a powerful role resisting accountability pressures emanating from non-professional actors.

Proposition 14: Field-level demands for accountability moderate the impact of professionalism on the effect of occupation and organization on innovation diffusion.

In the case of clinical guidelines, these pressures are pushing professionals' associations to distance themselves from the traditional model of professionalism and accommodate, and indeed collaborate with, these external constituencies. For instance, the American Medical Association signed a pact with Congress (the 'joint House–Senate working agreement with the AMA'), promising to develop more than 100 standard measures of performance, which doctors would report to the federal government in an effort to improve the quality of care (Pear, 2006).

These field-level pressures also weaken doctors' bases of resistance to the mutation carried by guidelines. In the case of doctors who deviate from insurance company mandated guidelines and order tests or procedures that the insurance company deems too expensive, these doctors can find their income directly affected and find themselves dropped from the list of approved providers. Under such pressures, some professionals defect from their traditional norms and values and become instead champions of bureaucratic control and/or market profitability in their own practices.

Professional organizations are another pathway for indirect pressure. Healthcare organizations are under pressure by both the public and private sector actors to reduce costs (in the USA, both Medicare and private insurers; and in the UK, NICE), and these actors often see greater managerial control over doctors as the best way to force change. These pressures encourage organizational leaders – both managers and physician-executives – to push for cost reductions, and they often use guidelines for that purpose. And indeed, Feldman et al. (1994) found that Medicare carriers used guidelines exclusively to identify and punish providers who over-utilized tests and treatment: seldom did carriers use guidelines to identify providers who provided insufficient care (see also Dopson, 2005; Mykhalovskiy and Weir, 2004).

Market Competition

Changes in the broader institutional field erode the autonomy of professionals not only in favour of hierarchical power of governments and organizations, but also in favour of

market competition among professionals themselves. Across a range of countries and occupations, economic pressures – and the popularity among elites of the neo-liberal recipe for responding to these pressures – have led to the dismantling of the prerogatives that traditionally shielded professionals from market competition and that long allowed them to cooperate (collude) in setting prices and standards (Champy, 2006; Lane et al., 2002). As professionals are pulled into the orbit of market competition, the dynamics of diffusion change: profitability displaces the factors that traditionally shaped diffusion.

This emphasis on financial performance over the quality of care often arouses the ire of professionals insofar as it conflicts with established public service values. However, with the dismantling of the institutional framework that protected professionals from the rigors of market competition, professionals themselves are increasingly drawn into the race of competitive advantage, encouraging a shift from social-trustee to pecuniary values.

Proposition 15: Competitive pressure moderates the impact of professionalism on the effect of occupation and organization on innovation diffusion.

In the case of clinical guidelines, recent decades have seen the rising influence of those who advocate competition among physicians and among healthcare delivery organizations. These competitive pressures have pushed hospitals, medical groups, and individual physicians to adopt clinical guidelines (Adler et al., 2003). Shortell et al. (2001), in a cross-sectional study of 56 medical groups across the USA, found that both compensation incentives and managed care market pressures were significantly associated with the use of clinical guidelines and among physicians.

CONCLUSION

The mutation of professionalism has been much discussed over several decades. Within the professions, the mutation is a complex, contested process – and the stakes are high. In medicine, this mutation has often been embodied in the adoption of clinical guidelines. The proliferation of guidelines profoundly rationalizes healthcare delivery. Guidelines' proponents argue that they represent a shift from craft, tacit forms of medical know-how towards more public and scientific forms, promising less variability, higher average quality, and lower total cost. Critics, however, argue that they undermine doctors' decision-making ability, their motivation to serve the individual patient, and the quality of care delivered.

Various forces contribute to and resist this mutation, forces operating at various levels. In an effort to develop a more integrated account, we proposed that we could view this mutation as a process in which new organizing practices diffuse among professionals. In building on this insight, we leveraged a considerable body of research on professionals and on the diffusion of innovations, and we advanced a set of propositions predicting the extent of diffusion of these new organizing practices, as represented by individual innovation adoption decisions, based on the distinctive features of individual professionals, professional organizations, and the broader institutional field within which they operate.

We argued that at the individual professional level, diffusion is more likely insofar as the innovation being diffused is compatible with the professional's own preferences

(Proposition 1), their knowledge bases (Proposition 2), practice patterns (Proposition 3), and values (Proposition 4), and insofar as it has already been adopted by peers (Proposition 5) or jurisdictional rivals (Proposition 6), or endorsed by peers in key diffusion roles (Proposition 7). The effect of these factors currently weighs largely against the diffusion of clinical guidelines and suggests considerable resistance to the associated mutation of the medical profession.

At the level of the professional organization, diffusion is handicapped by characteristic features of such organizations' strategies, structures, cultures, skills, and systems (Propositions 8–12). These factors too tend to limit diffusion/mutation in the medical field.

At the field level, associations, accountability, and competition are key factors conditioning the effect of professionalism on diffusion of guidelines and the mutation of professionalism. Accountability pressures have been important in driving diffusion/mutation in healthcare, while simultaneously provoking and undermining professionals' resistance. The competitive pressures play a more modest, although growing, role in driving change, but tend to draw professionals into colluding with the mutation underway.

Cumulative Effects

Each of these levels of analysis interacts with the others, with influences flowing both downward and upward. As innovations diffuse, their adoption can facilitate further diffusion, and the eventual mutation of professionalism (see the dotted line in Figure 1) – but sometimes also provoke greater resistance. The case of clinical guidelines illustrates this complex interaction.

The facilitating effects are easy to identify. First, among individual professionals, adoption by peers and rivals activates the identity mechanisms we discerned above, encouraging adoption by the focal individual. Surrounded by a growing number of peers who have adopted the guideline and accepted the logic of efficiency and accountability that it embodies, the individual professional's values are more likely to shift in that direction. Individuals' prior adoption of guidelines gives them more experience and comfort with the underlying statistical models.

Second, among professional organizations, we should expect mimetic effects: the adoption by peer organizations will encourage adoption by the focal organization. Normative effects will encourage accelerating adoption too, as professionals who have internalized the new logic influence their peers in other organizations, and may move between organizations, carrying with them their new orientations and practices. Moreover, specialized suppliers of IT systems and management skills development programmes appear, reducing the cost and effort required by the focal organization to adopt the new approaches.

At the field level, we should also expect diffusion to lead to more diffusion through mimetic isomorphism among professional associations. Medical training programmes are reformed, training young doctors in the new methods and socializing them into the new logic. Government and accrediting agencies learn how to check and reward compliance. Competitive rivalry forces individual professionals and professional organizations to comply or risk losing business to their more legitimate competitors.

However, diffusion can generate its own opposition, leveraging what remains of power of the profession to mobilize opposition to further diffusion and further loss of power. As an innovation proliferates, its dysfunctional effects become more visible, and critics mobilize around them. If the innovation does not deliver enough of the promised benefits, or if the associated costs and risks are revealed to be too high, opposition movements can stop and reverse the diffusion process.

Clinical guidelines have aroused considerable opposition among doctors, patients, and health advocates. Critics attempt to delegitimize the new practices by citing cases where the guidelines seem misconceived or where the outcomes seem unjust (see, for example, the attacks on Kaiser Permanente's guidelines at <http://www.kaiserthrive.org/>). While the pressures towards rationalization are immense, the future is not pre-ordained.

Future Research

Our analysis suggests three main lines of further research. First, future research might usefully explore the various factors that explain the relative importance of these three levels in the diffusion process. Three parameters seem worth exploring: the innovation's modularity and uncertainty, and the relative power of the individual and collective actors.

Modularity: When the innovation's adoption and use by one professional is unaffected by peers' behaviour, then the path of diffusion is determined simply by the sequence of individual professionals' adoption decisions, and the importance of the higher levels (i.e. organization and field) will be slight. Where, in contrast, adoption or use are interdependent, the relationship between individual and higher levels becomes more complex. For example, clinical guidelines that require cross-professional cooperation will diffuse more extensively if this cooperation is encouraged by the organization and the field.

Uncertainty: Where the benefits and costs of the innovation are more certain, here too diffusion will be determined by individual professional adoption decisions, and the higher levels (i.e. organization and field) will play little role. Conversely, if benefits and costs are less certain, individuals' choices will more likely be conditioned by organizational policies, and both individual and organizational choices will more likely be conditioned by field-level forces. Some clinical guidelines are more uncertain, and their diffusion will therefore depend considerably on organizational- and field-level pressures.

Power: Specialists who enjoy a monopoly over more highly valued expertise (and the organizations they form) will exert more control over the diffusion of new organizing practices than professionals in more vulnerable positions. Where the professional organizations are more powerful, the impact of institutional field will be weaker.

A second line of future research would focus on the interaction of the top-down and bottom-up processes. One promising avenue for future research on these dynamics is suggested by recent discussions of 'institutional work' (Lawrence and Suddaby, 2006; Lawrence et al., 2009). The diffusion of innovations is a contested and variable process. As a result, the various institutional work processes listed by Lawrence and Suddaby (2006) as contributing to 'creating institutions' are simultaneously processes for resisting this creation: advocacy can be both pro and con; efforts to define and vest new role structures are politically contentious; identities and normative associations are terrains of

contest; efforts to legitimize guidelines by mimicking other already legitimated practices (e.g. reliance on science) compete with efforts to de-legitimize guidelines by reframing them as illegitimate (e.g. 'rationing' healthcare); theorization and education efforts are met by counter-theorization and counter-education efforts.

A third line of research would expand our model to address the role of the broader national and international social structure. Our discussion of the field-level forces that shape diffusion already alluded to the downward influence of macro-economic pressures and ideologies such as neo-liberalism. This discussion should be enriched and broadened to account for a broader range of societal factors shaping the professions' fields, organizations, and individual practitioners, and the various ways in which actors at lower levels shape that higher level.

Given the social and economic stakes of the mutation of professionalism, and given the strong theoretical foundations that social scientists can build on for addressing the related issues, this area of research seems likely to attract more research attention in the future.

REFERENCES

- Abbott, A. (1981). 'Status and status strain in the professions'. *American Journal of Sociology*, **86**, 819–35.
- Abbott, A. D. (1988). *The System of Professions: An Essay on the Division of Expert Labor*. Chicago, IL: University of Chicago Press.
- Abrahamson, E. and Rosenkopf, L. (1993). 'Institutional and competitive bandwagons: using mathematical modeling as a tool to explore innovation diffusion'. *Academy of Management Review*, **18**, 487–517.
- Adler, P. S., Riley, P., Kwon, S.-W., Signer, J., Lee, B. and Satrasala, R. (2003). 'Performance improvement capability: keys to accelerating improvement in hospitals'. *California Management Review*, **45**, 12–33.
- Adler, P. S., Kwon, S. W. and Heckscher, C. (2008). 'Professional work: the emergence of collaborative community'. *Organization Science*, **19**, 359–76.
- Akers, R. L. (1968). 'The professional association and the legal regulation of practice'. *Law & Society Review*, **2**, 463–82.
- Anand, V., Manz, C. C. and Glick, W. H. (1998). 'An organizational memory approach to information management'. *Academy of Management Review*, **23**, 796–809.
- Ansari, S. M., Fiss, P. C. and Zajac, E. J. (2010). 'Made to fit: how practices vary as they diffuse'. *Academy of Management Review*, **35**, 67–92.
- Argote, L. (1999). *Organizational Learning: Creating, Retaining and Transferring Knowledge*. Boston, MA: Kluwer Academic.
- Argote, L., Ingram, P., Levine, J. M. and Moreland, R. L. (2000). 'Special Issue on Knowledge Transfer in Organizations: Learning from the Experience of Others'. *Organizational Behavior & Human Decision Processes*, **82**.
- Argote, L., McEvily, B. and Reagans, R. (2003). 'Special Issue on Managing Knowledge in Organizations: Creating, Retaining, and Transferring Knowledge'. *Management Science*, **49**.
- Arrow, K. (1974). *The Limits of Organization*. New York: Norton.
- Audet, A. M. J., Doty, M. M., Shamasdin, J. and Schoenbaum, S. C. (2005). 'Measure, learn, and improve: physicians' involvement in quality improvement'. *Health Affairs*, **24**, 843–53.
- Bain, K. T. (2007). 'Barriers and strategies to influencing physician behavior'. *American Journal of Medical Quality*, **22**, 5–7.
- Barley, S. (1986). 'Technology as an occasion for structuring: evidence from observations of CT scanners and the social order of radiology departments'. *Administrative Science Quarterly*, **31**, 78–108.
- Barnsley, J., Lemieux-Charles, L. and McKinney, M. M. (1998). 'Integrating learning into integrated delivery systems'. *Health Care Management Review*, **23**, 18–28.
- Baron, J. N., Dobbin, F. R. and Jennings, P. D. (1986). 'War and peace: the evolution of modern personnel administration in U.S. industry'. *American Journal of Sociology*, **92**, 350–83.
- Becker, M. H. (1970). 'Factors affecting diffusion of innovations among health professionals'. *American Journal of Public Health and the Nation's Health*, **60**, 294–304.
- Berwick, D. M. (2003). 'Disseminating innovations in health care'. *JAMA*, **289**, 1969–75.

- Berwick, D. M. and Nolan, T. W. (1998). 'Physicians as leaders in improving health care'. *Annals of Internal Medicine*, **128**, 289–92.
- Blumenthal, D. and Kilo, C. M. (1998). 'A report card on continuous quality improvement'. *Milbank Quarterly*, **76**, 625–48.
- Bodenheimer, T., Lo, B. and Casalino, L. (1999). 'Primary care physicians should be coordinators, not gatekeepers'. *JAMA*, **281**, 2045–9.
- Boerstler, H., Foster, R. W., O'Connor, E. J., O'Brien, J. L., Shortell, S. M., Carman, J. M. and Hughes, E. F. X. (1996). 'Implementation of total quality management: conventional wisdom vs. reality'. *Hospital & Health Services Administration*, **41**, 143–59.
- Borgatti, S. P. and Cross, R. (2003). 'A relational view of information seeking and learning in social networks'. *Management Science*, **49**, 432–45.
- Bradley, E. H., Holmboe, E. S., Mattera, J. A., Roumanis, S. A., Radford, M. J. and Krumholz, H. M. (2001). 'A qualitative study of increasing beta-blocker use after myocardial infarction: why do some hospitals succeed?'. *JAMA*, **285**, 2604–11.
- Brint, S. G. (1994). *In an Age of Experts: The Changing Role of Professionals in Politics and Public Life*. Princeton, NJ: Princeton University Press.
- Broadbent, J. and Laughlin, R. (2002). 'Public service professionals and the new public management: control of the professions in the public services'. In McLaughlin, K., Osborne, S. and Ferlie, E. (Eds), *New Public Management: Current Trends and Future Prospects*. London: Routledge, 95–108.
- Brock, D., Hinings, C. R. and Powell, M. (1999). *Restructuring the Professional Organization: Accounting, Health Care, and Law*. London. New York: Routledge.
- Brown, J. S. and Duguid, P. (1991). 'Organizational learning and communities-of-practice: toward a unified view of working, learning, and innovation'. *Organization Science*, **2**, 40–57.
- Bucher, R. and Stelling, J. (1969). 'Characteristics of professional organizations'. *Journal of Health and Social Behavior*, **10**, 3–15.
- Burt, R. S. (1987). 'Social contagion and innovation: cohesion versus structural equivalence'. *American Journal of Sociology*, **92**, 1287–335.
- Cabana, M. D., Rand, C. S., Powe, N. R., Wu, A. W., Wilson, M. H., Abboud, P. A. and Rubin, H. R. (1999). 'Why don't physicians follow clinical practice guidelines? A framework for improvement'. *JAMA*, **282**, 1458–65.
- Callon, M. (1986). 'Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay'. In Law, J. (Ed.), *Power Action and Belief. A New Sociology of Knowledge?* London: Routledge, 196–223.
- Champy, F. (2006). 'Professional discourses under the pressure of economic values'. *Current Sociology*, **54**, 649–61.
- Cohen, W. M. and Levinthal, D. A. (1990). 'Absorptive capacity: a new perspective on learning and innovation'. *Administrative Science Quarterly*, **35**, 128–52.
- Coleman, III, W. P. (1999). 'The history of liposuction and fat transplantation in America'. *Dermatologic Clinics*, **17**, 723–7.
- Coleman, J. S., Katz, E. and Menzel, H. (1966). *Medical Innovation: A Diffusion Study*. Indianapolis, IN: Bobbs-Merrill Co.
- Cook, J. V. (1995). 'Innovation and leadership in a mental health facility'. *American Journal of Occupational Therapy*, **49**, 595–606.
- Cool, K., Dierickx, I. and Szulanski, G. (1997). 'Diffusion of innovations within organizations: electronic switching in the Bell system, 1971–1982'. *Organization Science*, **8**, 543–59.
- Cooper, D. J. and Robson, K. (2006). 'Accounting, professions and regulation: locating the sites of professionalization'. *Accounting, Organizations and Society*, **31**, 415–44.
- Cooper, D. J., Hinings, B., Greenwood, R. and Brown, J. L. (1996). 'Sedimentation and transformation in organizational change: the case of Canadian law firms'. *Organization Studies*, **17**, 623–47.
- Cotton, J., Vollrath, D., Froggatt, K., Lengnick-Hall, M. and Jennings, K. (1998). 'Employee participation: diverse forms and different outcomes'. *Academy of Management Review*, **13**, 8–22.
- Crosby, P. (1996). *The Absolutes of Leadership*. San Diego, CA: Pfeiffer and Company.
- Czarniawska, B. and Joerges, B. (1996). 'Travels of ideas'. In Czarniawska, B. and Sevón, G. (Eds), *Translating Organizational Change*. Vol. 56. Berlin: de Gruyter, 13–48.
- Damanpour, F. (1991). 'Organizational innovation: a meta-analysis of effect of determinants and moderators'. *Academy of Management Journal*, **34**, 555–90.
- Davenport, T. H. and Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Boston, MA: Harvard Business School Press.

- Denis, J.-L., Hebert, Y., Langley, A., Lozeau, D. and Trottier, L.-H. (2002). 'Explaining diffusion patterns for complex health care innovations'. *Health Care Management Review*, **27**, 60–73.
- Deziel, D. J., Millikan, K. W., Economou, S. G., Doolas, A., Ko, S. T. and Airan, M. C. (1993). 'Complications of laparoscopic cholecystectomy: a national survey of 4,292 hospitals and an analysis of 77,604 cases'. *American Journal of Surgery*, **165**, 9–14.
- DiMaggio, P. J. and Powell, W. W. (1983). 'The iron cage revisited: institutional isomorphism and collective rationality in organizational fields'. *American Sociological Review*, **48**, April, 147–60.
- DiMaggio, P. J. and Powell, W. W. (1991). 'The new institutionalism in organizational analysis: introduction'. In Powell, W. W. and DiMaggio, P. J. (Eds), *The New Institutionalism in Organizational Analysis*. Chicago, IL and London: University of Chicago Press, 1–38.
- Dopson, S. (2005). 'The diffusion of medical innovations: can figurational sociology contribute?'. *Organization Studies*, **26**, 1125–44.
- Dopson, S. and Fitzgerald, L. (2005). *Knowledge to Action? Evidence Based Health Care in Context*. New York: Oxford University Press.
- Duckers, M., Wagner, C., Vos, L. and Groenewegen, P. (2011). 'Understanding organisational development, sustainability, and diffusion of innovations within hospitals participating in a multilevel quality collaborative'. *Implementation Science*, **6**, 18.
- Edmondson, A. C., Bohmer, R. M. and Pisano, G. P. (2001). 'Disrupted routines: team learning and new technology implementation in hospitals'. *Administrative Science Quarterly*, **46**, 685–716.
- Emanuel, E. J. and Emanuel, L. L. (1996). 'What is accountability in health care?'. *Annals of Internal Medicine*, **124**, 229–39.
- Epstein, A. M. (2007). 'Pay for performance at the tipping point'. *New England Journal of Medicine*, **356**, 515–17.
- Etzioni, A. (1969). *The Semi-Professions and Their Organizations*. New York: The Free Press.
- Eve, R. and Hodgkin, P. (1997). 'Professionalism and medicine'. In Broadbent, J., Dietrich, M. and Roberts, J. (Eds), *The End of the Professions? The Restructuring of Professional Work*, Vol. 4. London and New York: Routledge, 67–84.
- Feldman, R. D., Nyman, J. A., Shapiro, J. and Grogan, C. M. (1994). 'How will we use clinical guidelines? The experience of Medicare carriers'. *Journal of Health Politics, Policy and Law*, **19**, 7–26.
- Fennell, M. L. and Warnecke, R. B. (1988). *The Diffusion of Medical Innovations: An Applied Network Analysis*. New York: Plenum Press.
- Ferlie, E. (2010). *Networks in Health Care: A Comparative Study of Their Management, Impact and Performance*. London: School of Management, Royal Holloway University of London.
- Ferlie, E., Fitzgerald, L., Wood, M. and Hawkins, C. (2005). 'The nonspread of innovations: the mediating role of professionals'. *Academy of Management Journal*, **48**, 117–34.
- Fitzgerald, L., Ferlie, E., Wood, M. and Hawkins, C. (2002). 'Interlocking interactions, the diffusion of innovations in health care'. *Human Relations*, **55**, 1429–49.
- Frank, K. A., Zhao, Y. and Borman, K. (2004). 'Social capital and the diffusion of innovations within organizations: application to the implementation of computer technology in schools'. *Sociology of Education*, **77**, 148–71.
- Freidson, E. (1970). *Profession of Medicine: A Study of the Sociology of Applied Knowledge*. New York: Dodd Mead.
- Freidson, E. (1984). 'The changing nature of professional control'. *Annual Review of Sociology*, **10**, 1–20.
- Freidson, E. (2001). *Professionalism: The Third Logic*. Chicago, IL: University of Chicago Press.
- Gagliardi, A., Brouwers, M., Palda, V., Lemieux-Charles, L. and Grimshaw, J. (2011). 'How can we improve guideline use? A conceptual framework of implementability'. *Implementation Science*, **6**, 1.
- Gawande, A. (1999a). 'Whose body is it, anyway? What doctors should do when patients make bad decisions'. *The New Yorker*, 4 October, 84–91.
- Gawande, A. (1999b). 'When doctors make mistakes'. *The New Yorker*, **74**, 40–55.
- Ghoshal, S. and Bartlett, C. A. (1988). 'Creation, adoption, and diffusion of innovations by subsidiaries of multinational corporations'. *Journal of International Business Studies*, **19**, 365–88.
- Gibbons, D. E. (2004). 'Friendship and advice networks in the context of changing professional values'. *Administrative Science Quarterly*, **49**, 238–62.
- Goss, M. E. W. (1961). 'Influence and authority among physicians in an outpatient clinic'. *American Sociological Review*, **26**, 39–50.
- Gouldner, A. W. (1957). 'Cosmopolitans and locals: toward an analysis of latent social roles'. *Administrative Science Quarterly*, **2**, 281–306.
- Granovetter, M. S. (1973). 'The strength of weak ties'. *American Journal of Sociology*, **78**, 1360–80.

- Gray, B. H. (1991). *The Profit Motive and Patient Care: The Changing Accountability of Doctors and Hospitals*. Cambridge, MA: Harvard University Press.
- Greaney, T. (2002). 'Whither antitrust? The uncertain future of competition law in health care'. *Health Affairs*, **21**, 185–96.
- Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P. and Kyriakidou, O. (2004). 'Diffusion of innovations in service organizations: systematic review and recommendations'. *The Milbank Quarterly*, **82**, 581–629.
- Greenwood, R., Hinings, C. R. and Brown, J. (1990). "'P2-form" strategic management: corporate practices in professional partnerships'. *Academy of Management Journal*, **33**, 725–55.
- Greenwood, R., Suddaby, R. and Hinings, C. R. (2002). 'Theorizing change: the role of professional association in the transformation of institutionalized fields'. *Academy of Management Journal*, **45**, 58–80.
- Greer, A. L. (1987). 'The two cultures of biomedicine: can there be consensus?'. *JAMA*, **258**, 2739–40.
- Grilli, R. and Lomas, J. (1994). 'Evaluating the message: the relationship between compliance rate and the subject of a practice guideline'. *Medical Care*, **32**, 202–13.
- Grimshaw, J. M., Shirran, L., Thomas, R., Mowatt, G., Fraser, C., Bero, L., Grilli, R., Harvey, E., Oxman, A. and O'Brien, M. A. (2001). 'Changing provider behavior: an overview of systematic reviews of interventions'. *Medical Care*, **39**, 8, Suppl 2, II2–45.
- Gupta, A. K. and Govindarajan, V. (2000). 'Knowledge flows within multinational corporations'. *Strategic Management Journal*, **21**, 473–96.
- Gustafson, D. H., Sainfort, F., Eichler, M., Adams, L., Bisognano, M. and Steudel, H. (2003). 'Developing and testing a model to predict outcomes of organizational change'. *Health Services Research*, **38**, 751–76.
- Guyatt, G., Gutterman, D., Baumann, M. H., Addrizzo-Harris, D., Hylek, E. M., Phillips, B., Raskob, G., Lewis, S. Z. and Schüneman, H. (2006). 'Grading strength of recommendations and quality of evidence in clinical guidelines'. *Chest*, **129**, 174–81.
- Hackbarth, G. M. (2005). 'Physician-owned specialty hospitals'. http://www.medpac.gov/documents/Mar05_SpecHospitals.pdf.
- Halpern, S. A. (1992). 'Dynamics of professional control: internal coalitions and crossprofessional boundaries'. *American Journal of Sociology*, **97**, 994–1021.
- Hansen, M. T. (1999). 'The search-transfer problem: the role of weak ties in sharing knowledge across organizational subunits'. *Administrative Science Quarterly*, **44**, 82–111.
- Hellinger, F. J. and Young, G. J. (2001). 'An analysis of physician antitrust exemption legislation'. *JAMA*, **286**, 83–8.
- Hughes, J., Humphrey, C., Rogers, S. and Greenhalgh, T. (2002). 'Evidence into action: changing practice in primary care'. *Occasional Papers, Royal College of General Practitioners*, **84**, i-51.
- Hutchins, G. (1999). 'Project management: the next big thing'. *Quality Progress*, **32**, 118–19.
- Institute of Medicine (1990). *Clinical Practice Guidelines: Directions for a New Program*. Washington DC: National Academy Press.
- Jonsson, S. (2009). 'Refraining from imitation: professional resistance and limited diffusion in a financial market'. *Organization Science*, **20**, 172–86.
- Kaluzny, A. D. (1974). 'Innovation in health services: theoretical framework and review of research'. *Health Services Research*, **9**, 101–20.
- Kane, A. A., Argote, L. and Levine, J. M. (2005). 'Knowledge transfer between groups via personnel rotation: effects of social identity and knowledge quality'. *Organizational Behavior & Human Decision Processes*, **96**, 56–71.
- King, J. H. (1986). *The Law of Medical Malpractice*. St Paul, MN: West Publishing.
- Kostova, T. (1999). 'Transnational transfer of strategic organizational practices: a contextual perspective'. *Academy of Management Review*, **24**, 2.
- Kronus, C. (1976). 'The evolution of occupational power'. *Sociology of Work and Occupations*, **3**, 3–37.
- Lane, C., Potton, M. and Litteck, W. (2002). 'The professions between state and market: a cross-national study of convergence and divergence'. *European Societies*, **4**, 235–60.
- Larson, M. S. (1977). *The Rise of Professionalism: A Sociological Analysis*. Berkeley, CA: University of California Press.
- Latour, B. (1987). *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.
- Lawrence, T. and Suddaby, R. (2006). 'Institutions and institutional work'. *Handbook of Organization Studies*, **2**, 215–54.
- Lawrence, T. B., Suddaby, R. and Leca, B. (2009). *Institutional Work: Actors and Agency in Institutional Studies of Organizations*. Cambridge, New York: Cambridge University Press.

- Lazarsfeld, P. and Merton, R. (1982). 'Friendship as social process: a substantive and methodological analysis'. In Lazarsfeld, P. F. and Kendall, P. L. (Eds), *The Varied Sociology of Paul F. Lazarsfeld: Writings*. New York: Columbia University Press, 18–66.
- Leicht, K. T. and Fennell, M. L. (1997). 'The changing organizational context of professional work'. *Annual Review of Sociology*, **23**, 215–31.
- Lemieux-Charles, L. and McGuire, W. L. (2006). 'What do we know about health care team effectiveness? A review of the literature'. *Medical Care Research and Review*, **63**, 263–300.
- Leonard-Barton, D. (1990). 'Implementing new production technologies: exercises in corporate learning'. In Von Glinow, M. A. and Mohrman, S. A. (Eds), *Managing Complexity in High Technology Organizations*. New York: Oxford University Press, 160–87.
- Leonard-Barton, D. (1995). *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*. Boston, MA: Harvard Business School Press.
- Levin, D. C. and Rao, V. M. (2004). 'Turf wars in radiology: the over-utilization of imaging resulting from self-referral'. *Journal of the American College of Radiology*, **1**, 169–72.
- Lippman, S. A. and Rumelt, R. P. (1982). 'Uncertain imitability: an analysis of interfirm differences in efficiency under competition'. *Bell Journal of Economics*, **13**, 418–38.
- Locock, L., Dopson, S., Chambers, D. and Gabbay, J. (2001). 'Understanding the role of opinion leaders in improving clinical effectiveness'. *Social Science & Medicine*, **53**, 745–57.
- Lohr, K. N. (1995). 'Guidelines for clinical practice: what they are and why they count'. *Journal of Law and Medical Ethics*, **23**, 49–56.
- Löwy, I. (1996). *Between Bench and Bedside: Science, Healing, and Interleukin-2 in a Cancer Ward*. Cambridge, MA: Harvard University Press.
- Maguire, S., Hardy, C. and Lawrence, T. B. (2004). 'Institutional entrepreneurship in emerging fields: HIV/AIDS treatment advocacy in Canada'. *Academy of Management Journal*, **47**, 657–79.
- Mansfield, E. (1993). 'The diffusion of flexible manufacturing systems in Japan, Europe and the United States'. *Management Science*, **39**, 149–59.
- McLaughlin, C. P. and Kaluzny, A. D. (1990). 'Total quality management in health: making it work'. *Health Care Management Review*, **15**, 7–14.
- Mechanic, D. (1996). 'Changing medical organization and the erosion of trust'. *The Milbank Quarterly*, **74**, 171–89.
- Meyer, J. and Rowan, B. (1977). 'Institutional organizations: formal structure as myth and ceremony'. *American Journal of Sociology*, **83**, 340–63.
- Meyer, M., Johnson, J. D. and Ethington, C. (1997). 'Contrasting attributes of preventive health innovations'. *Journal of Communication*, **47**, 112–31.
- Middlehurst, R. and Kennie, T. (1997). 'Leading professionals: towards new concepts of professionalism'. In Broadbent, J., Dietrich, M. and Roberts, J. (Eds), *The End of the Professions? The Restructuring of Professional Work*, Vol. 4. London and New York: Routledge, 49–66.
- Mintzberg, H. (1979). *The Structuring of Organizations: A Synthesis of the Research*. Englewood Cliffs, NJ: Prentice-Hall.
- Moore, W. (1970). *The Professions: Roles and Rules*. New York: Russell Sage Foundation.
- Morris, C. R. (1999). 'The health-care economy is nothing to fear'. *The Atlantic Monthly*, **284**, 6, 86–96.
- Motwani, J., Sower, V. E. and Brashier, L. W. (1996). 'Implementing TQM in the health care sector'. *Health Care Management Review*, **21**, 73–82.
- Mundinger, M. O., Kane, R. L., Lenz, E. R., Totten, A. M., Tsai, W. Y., Cleary, P. D., Friedewald, W. T., Siu, A. L. and Shelanski, M. L. (2000). 'Primary care outcomes in patients treated by nurse practitioners or physicians: a randomized trial'. *JAMA*, **283**, 59–68.
- Murphy, R. (1990). 'Proletarianization and bureaucratization: the fall of the professional'. In Torstendahl, R. and Burrage, M. (Eds), *The Formation of the Professional*. London: Sage, 70–96.
- Muzio, D., Ackroyd, S. and Chanlat, J.-F. (2008). *Redirections in the Study of Expert Labour: Established Professions and New Expert Occupations*. Basingstoke and New York: Palgrave Macmillan.
- Mykhalovskiy, E. and Weir, L. (2004). 'The problem of evidence-based medicine: directions for social science'. *Social Science & Medicine*, **59**, 1059–69.
- Naveh, E., Katz-Navon, T. and Stern, Z. (2005). 'Treatment errors in healthcare: a safety climate approach'. *Management Science*, **51**, 948–60.
- O'Dell, C. S. and Grayson, C. J. (1998). 'If only we knew what we know: identification and transfer of internal best practices'. *California Management Review*, **40**, 154–74.

- O'Neill, H. M., Pouder, R. W. and Buchholtz, A. K. (1998). 'Patterns in the diffusion of strategies across organizations: insights from the innovation diffusion literature'. *Academy of Management Review*, **23**, 98–114.
- Øvretveit, J., Bate, P., Cleary, P., Cretin, S., Gustafson, D., McInnes, K., McLeod, H., Molfenter, T., Plsek, P., Robert, G., Shortell, S. and Wilson, T. (2002). 'Quality collaboratives: lessons from research'. *Quality and Safety in Health Care*, **11**, 345–51.
- Panush, R. S. (1995). 'A higher standard'. *American Journal of Medicine*, **98**, 211–12.
- Parchman, M., Scoglio, C. and Schumm, P. (2011). 'Understanding the implementation of evidence-based care: a structural network approach'. *Implementation Science*, **6**, 14.
- Parsons, T. (1939). 'The professions and social structure'. *Social Forces*, **17**, 457–67.
- Pear, R. (2006). 'AMA to develop measure of quality of medical care'. *The New York Times*, 21 February.
- Pettigrew, A., Ferlie, E. and Mckee, L. (1992). *Shaping Strategic Change*. London: Sage.
- Pierce, J. L. and Delbecq, A. L. (1977). 'Organization structure, individual attitudes and innovation'. *Academy of Management Review*, **2**, 27–37.
- Portes, A. (1998). 'Social capital: its origins and applications in modern sociology'. *Annual Review of Sociology*, **24**, 1–24.
- Rappolt, S. G. (1997). 'Clinical guidelines and the fate of medical autonomy in Ontario'. *Social Science and Medicine*, **44**, 977–87.
- Rice, R. E. and Rogers, E. M. (1980). 'Re-invention in the innovation process'. *Knowledge: Creation, Diffusion, Utilization*, **1**, 499–514.
- Robinson, J. C. (1999). *The Corporate Practice of Medicine: Competition and Innovation in Health Care*. Berkeley, CA: University of California Press.
- Rogers, E. M. (2003). *Diffusion of Innovations*, 5th edition. New York: Free Press.
- Rosen, A., Proctor, E., Morrow-Howell, N. and Staudt, M. (1995). 'Rationales for practice decisions: variations in knowledge use by decision task and social work service'. *Research on Social Work Practice*, **5**, 501–23.
- Ryan, M. J. and Thompson, W. P. (1998). *CQI and the Renovation of an American Health Care System: A Culture under Construction*. Milwaukee, WI: ASQ Quality Press.
- Sahlin, K. and Wedlin, L. (2008). 'Circulating ideas: imitation, translation and editing'. In Haveman, H., David, R., Greenwood, R., Oliver, C., Sahlin, K. and Suddaby, R. (Eds), *The Sage Handbook of Organizational Institutionalism*. London: Sage, 218–42.
- Scharffs, B. G. (2001). 'Law a craft'. *Vanderbilt Law Review*, **54**, 2243–347.
- Schlich, T. (2002). 'Degrees of control: the spread of operative fracture treatment with metal implants: a comparative perspective on Switzerland, East Germany and the USA, 1950s–1990s'. In Stanton, J. (Ed.), *Innovations in Health and Medicine: Diffusion and Resistance in the Twentieth Century*. London; New York: Routledge, 106–26.
- Scott, W. R. (1982). 'Managing professional work: three models of control for health organizations'. *Health Services Research*, **17**, 213–40.
- Scott, W. R. (1991). *Organization: Rational, Natural and Open Systems*, 3rd edition. New York: Prentice Hall.
- Scott, W. R. (2008). 'Lords of the dance: professionals as institutional agents'. *Organization Studies*, **29**, 219–38.
- Scott, W. R., Ruef, M., Mendel, P. J. and Caronna, C. (2000). *Institutional Change and Health Care Organizations: From Professional Dominance to Managed Care*. Chicago, IL: University of Chicago Press.
- Sharma, A. (1997). 'Professional as agent: knowledge asymmetry in agency exchange'. *Academy of Management Review*, **22**, 758–98.
- Shortell, S. M., Levin, D. Z., O'Brian, J. L. and Hughes, E. F. X. (1995). 'Assessing the evidence on CQI: is the glass half empty or half full?'. *Hospital & Health Services Administration*, **40**, 4–24.
- Shortell, S. M., Bennett, C. L. and Byck, G. R. (1998). 'Assessing the impact of continuous quality improvement on clinical practice: what it will take to accelerate progress'. *Milbank Quarterly*, **76**, 593–624.
- Shortell, S. M., Zazzali, J. L., Burns, L. R., Alexander, J. A., Gillies, R. R., Budetti, P. P., Waters, T. M. and Zuckerman, H. S. (2001). 'Implementing evidence-based medicine: the role of market pressures, compensation incentives, and culture in physician organizations'. *Medical Care*, **39**, 7, Suppl. 1, I62–78.
- Smith, W. R. (2000). 'Evidence for the effectiveness of techniques to change physician behavior'. *Chest*, **118**, 2 Suppl., 8S–17S.
- Starr, P. (1982). *The Social Transformation of American Medicine*. New York: Basic Books.
- Strang, D. and Soule, S. A. (1998). 'Diffusion in organizations and social movements: from hybrid corn to poison pills'. *Annual Review of Sociology*, **24**, 265–90.

- Strauss, A., Schatzman, L., Ehrlich, D., Bucher, R. and Sabshin, M. (1963). 'The hospital and its negotiated order'. In Freidson, E. (Ed.), *The Hospital in Modern Society*. New York: Free Press of Glencoe, 147–69.
- Sullivan, W. M. (2005). *Work and Integrity: The Crisis and Promise of Professionalism in America*, 2nd edition. San Francisco, CA: Jossey-Bass.
- Szulanski, G. (1995). 'Unpacking stickiness: an empirical investigation of the barriers to transfer best practice inside the firm'. *Academy of Management Journal*, Special Issue: Best Papers Proceedings, 437–41.
- Szulanski, G. (1996). 'Exploring internal stickiness: impediments to the transfer of best practice within the firm'. *Strategic Management Journal*, **17**, S2, 27–44.
- Szulanski, G. (2003). *Stickiness and Knowledge Transfer*. Thousand Oaks, CA: Sage.
- Szulanski, G., Cappetta, R. and Jensen, R. J. (2004). 'When and how trustworthiness matters: knowledge transfer and the moderating effect of causal ambiguity'. *Organization Science*, **15**, 600–13.
- Tanenbaum, S. J. (1994). 'Knowing and acting in medical practice: the epistemological politics of outcomes research'. *Journal of Health Politics, Policy and Law*, **19**, 27–44.
- Taylor, V. M., Goldberg, H. I., Deyo, R. A., Cooper, S., Leek, M., Nordgulen, L. L., Spunt, B. and Conrad, D. (1996). 'Modifying community practice styles: the back pain outcome assessment team information dissemination effort'. *Journal of Continuing Education in the Health Professions*, **16**, 203–14.
- Thompson, J. D. (1967). *Organizations in Action: Social Science Bases of Administrative Theory*. New York: McGraw-Hill.
- Timmermans, S. (2008). 'Professions and their work: do market shelters protect professional interests?'. *Work and Occupations*, **35**, 164–88.
- Tiwana, A. (2002). *The Knowledge Management Toolkit: Orchestrating IT, Strategy, and Knowledge Platforms*, 2nd edition. Upper Saddle River, NJ: Prentice Hall.
- Tolbert, P. S. and Zucker, L. G. (1983). 'Institutional sources of change in the formal structure of organizations: the diffusion of civil service reform, 1880–1935'. *Administrative Science Quarterly*, **28**, 22–39.
- Tunis, S., Hayward, R. S., Wilson, M. C., Rubin, H. R., Bass, E. B., Johnston, M. and Steinberg, E. P. (1994). 'Internists' attitudes about clinical practice guidelines'. *Annals of Internal Medicine*, **120**, 956–63.
- US Securities and Exchange Commission 'Order regarding Section 103(a)(3)(B) of the Sarbanes-Oxley Act of 2002'. 2003 (<http://www.sec.gov/rules/other/33-8222.htm>; accessed 2 Oct 2006).
- Van Maanen, J. and Barley, S. R. (1984). 'Occupational communities: culture and control in organizations'. *Research in Organizational Behavior*, **6**, 287–365.
- Vigoda, M. M., Gencorelli, F. and Lubarsky, D. A. (2006). 'Changing medical group behaviors: increasing the rate of documentation of quality assurance events using an anesthesia information system'. *Anesthesia & Analgesia*, **103**, 390–5.
- Wallace, J. E. (1995). 'Organizational and professional commitment in professional and nonprofessional organizations'. *Administrative Science Quarterly*, **40**, 228–55.
- Weeden, K. A. (2002). 'Why do some occupations pay more than others? Social closure and earnings inequality in the United States'. *American Journal of Sociology*, **108**, 55–101.
- Westphal, J. D., Gulati, R. and Shortell, S. M. (1997). 'Customization or conformity: an institutional and network perspective on the content and consequences of TQM adoption'. *Administrative Science Quarterly*, **42**, 366–94.
- Woolf, S. H., Grol, R., Hutchinson, A., Eccles, M. and Grimshaw, J. (1999). 'Clinical guidelines: potential benefits, limitations, and harms of clinical guidelines'. *BMJ (Clinical Research Edition)*, **318**, 527–30.
- Young, G. J., Charns, M. P., Daley, J., Forbes, M. G., Henderson, W. and Khuri, S. F. (1997). 'Best practices for managing surgical services: the role of coordination'. *Health Care Management Review*, **22**, 72–81.
- Young, G. J., Charns, M. P., Desai, K., Khuri, S. F., Forbes, M. G., Henderson, W. and Daley, J. (1998). 'Patterns of coordination and clinical outcomes: a study of surgical services'. *Health Services Research*, **33**, 5 Pt 1, 1211–36.
- Zander, U. and Kogut, B. (1995). 'Knowledge and the speed of the transfer and imitation of organizational capabilities: an empirical test'. *Organization Science*, **6**, 76–92.
- Zetka, J. R. (2001). 'Occupational divisions of labor and their technology politics: the case of surgical scopes and gastrointestinal medicine'. *Social Forces*, **79**, 1495–520.
- Zucker, L. G. (1986). 'Production of trust: institutional sources of economic structure, 1840–1920'. *Research in Organizational Behavior*, **8**, 53–111.
- Zuckerman, H. S., Hilberman, D. W., Andersen, R. M., Burns, L. R., Alexander, J. A. and Torrens, P. (1998). 'Physicians and organizations: strange bedfellows or a marriage made in heaven?'. *Frontiers of Health Services Management*, **14**, 3–34.