RESISTING OR GOVERNING RISK? PROFESSIONAL STRUGGLES AND THE REGULATION OF SAFE SCIENCE

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ABSTRACT

Drawing on a 17-month ethnographic study of a scientific community, I investigate how organizational members mobilize competing normative templates stemming from professional and legal frameworks in order to craft safe work. This case highlights how micro-level contests within a professional community are constitutive of institutional arrangements by allowing powerful professionals to claim authority over rules that would otherwise threaten their autonomy.

INTRODUCTION

Societal concern over safety and the accompanying development of risk-management systems have led to a rise in the legal regulation of space primarily governed by professions and professional norms (see Ewick and Silbey, 2011). Powerful professionals such as lawyers, physicians or scientists increasingly contend with regulatory frameworks that purport to reorganize work arrangements and threaten professional autonomy. Institutional studies have highlighted how professionals protect their autonomy from societal demands though ceremonial compliance and decoupling practice from public face (Edelman, 1992; Meyer and Rowan, 1977). Other studies highlight that regulatory logics can penetrate professional jurisdictions in practice and reshape work arrangements (Kellogg, 2009). Yet these approaches largely focus on the outcome rather than on the process of the struggle. There is little research on how professionals navigate the contradictions between the demands of professional and regulatory norms in their everyday work. This is not an idle question. Everyday negotiations among normative frameworks are constitutive of professional and occupational work (Hughes, 1958; Bechky, 2011). Moreover, professionals, more so than any other actors, powerfully create, carry and shape society's institutional arrangements (Freidson, 1988). Moving beyond the question of resistance or accommodation to legal regulation, this paper explores how ongoing micro-level struggles between normative templates are constitutive of institutional arrangements.

Drawing on a seventeen month ethnographic study of scientific work, I investigate how actors occupying different roles negotiate among competing safety templates: norms provided by the scientific profession and norms promoted by the regulatory risk management system. I find that while high-status professionals (researchers) primarily mobilize professional norms and punish professional violations by lower status members (technicians), they nonetheless mobilize, blend and selectively implement legal rules. These selective rules mobilizations are not just pragmatic actions that allow work to go on. They are part of an ongoing struggle that allows professionals to maintain their autonomy by strategically internalizing external governance templates provided by legal regulation.

RESEARCH SETTING AND METHOD

Academic science constitutes an ideal setting to study local contests between professional and legal norms. Academic laboratories have long operated with a large degree of autonomy from social oversight while seeking to harness complex and sometimes dangerous technologies (Galison, 1997). Over the last decades, there has been renewed effort to regulate these autonomous areas of work despite important resistance from scientists (Huising and Silbey, 2011).

Data were collected through seventeen months of fieldwork in Med Lab (a pseudonym), a large academic laboratory performing basic research related to blood diseases and cancer. The laboratory has 41 members under the supervision of one Principal Investigator. Postdoctoral fellows represent 52% of the laboratory population, PhD students, 10% and technicians, 38%. The scientists are organized into five teams: Blood, Embryology, Reprogramming, Cancer and Core services. Each team is organized around a specific material platform, a coherent system of experimental models, techniques, protocols and theoretical assumptions which drive their inquiry. Hazardous materials handled in the laboratory are classified into three broad categories: chemical hazards, biohazards and radioactive isotopes. Each class of hazards is associated with specific regulation, safety experts and dedicated workspace. Fieldwork included shadowing scientists, observing laboratory work, attending weekly meetings and informal events such as team lunches, breaks and celebratory events. Observations were completed with formal open-ended interviews. I kept extended fieldnotes of laboratory observations. All interviews were recorded and transcribed. This approach allowed identifying recurring patterns of interactions around specific hazards. Safety incidents were traced from their beginning through their resolution, including the interpretation of members involved in or informed about the incidents.

Adopting a grounded theory approach (Glaser and Strauss, 1967), I interactively collected and analyzed data, comparing new data with emerging categories of interests. This analysis allowed the identification of over 150 safety events. Safety events are defined as observed or narrated episodes involving individual interaction with or social interaction related to hazardous materials, include safety trainings, inspections, meetings, incidents and everyday interactions in the laboratory. Individual events were then coded using Atlas TI and analyzed in order to identify the role of the actors involved in the event, which framework (professional or legal) was invoked to interpret, explain or justify the event, by whom the logic was invoked, how the event was resolved. These data provide a rich understanding of the ongoing negotiations around safety.

The following section only reproduces a snapshot of the data. A full draft can be obtained from the author for anyone interested in the empirical description.

RESULTS

The professional view of safety

Coupled with scientific expertise. For scientists, safety is derived from the detailed knowledge of their environment: their working materials, the material layout of the laboratory and the human layout of the laboratory (who works with what and how, who knows what). In the professional perspective, safety is inseparable from scientific knowledge, as a Postdoctoral Fellow describes:

> *I feel pretty safe. We do have some chemicals that are toxic obviously. It's just you're trained and we have chemical fume hoods. For example, I know enough about Phenol to know that I wouldn't set it up on my bench and not [work with it all day]. So*

I don't worry about chemicals because I pretty much know if something's toxic and when I should wear gloves.

Tacit and embodied. Scientists ensure safety through the use of tacit and embodied work. For instance, they use smell and bodily awareness to assess and control the working environment. They scan their environment for smells that would reveal someone working with toxic materials and will remark if such toxic product was mishandled. Surface contact awareness is a similarly embodied skill. Lab safety requires keeping surfaces clear of potentially harmful materials such as chemicals, biomaterials or radioactive isotopes. This is challenging as many hazardous materials are not necessarily visible. In addition, products containment and segregation is self-defeating: to avoid tracking materials, scientists would need to change gloves each time they touch a different surface. As a result workers work to minimize surface contact by keeping their hands to themselves.

Collective. Safety is a collective endeavor achieved through signaling and avoidance tactics. Scientists' central concern is whether they can trust their co-workers: will everyone adopt the same precautions or will co-workers avoid one another when carrying hazardous materials down busy corridors? When describing whether they are safe, scientists generally comment on other's behaviors: they note whether or not "people know what they are doing here" or whether they are "lax," "sloppy" or "lack attention to hygiene." Scientists signal to one another the types of materials or hazards they are working with and whether they should be avoided or not. For instance, when scientists put on a lab coat, they signal that they are working with a particular hazard that requires added protection. In response, co-workers enact careful avoidance tactics. Lab coat wearers are in turn carefully scrutinized and avoided.

Learnt through apprenticeship. Newcomers learn professional safety through on-the-job training and mentoring. Training involves detailed explanations of the characteristic, effects and health implications of the materials used and the best way to handle them safely according to the norms of scientific work. Newcomers are constantly instructed to avoid all contact with materials. A recurring request is "do not touch anything." They are also carefully socialized into avoiding contact with co-workers by paying attention to who is around them and who is carrying what. Attention is also given to embodied practice. Mentors observe and emphasize practices aimed at minimizing materials contamination by comments such as "watch your hands," "you need to bleach this," "I change my gloves each time I exit this room," "I avoid touching the bench surface with my hands," "you should avoid breathing this." Careful judgments are made about a person's skillfulness at manipulating experimental materials. Good embodied skills also allow for the precise performance of experimental work and obtaining "clean results" – results that are not blurred by external contamination or by unwanted mixing of the various solutions used in experimental steps. Gaining experimental skills is an ongoing effort, reinforced by respect for the learner's efforts and admiration for those who attain mastery. Consistent with this model, new students do not own protective equipment (such as lab coat or glasses). This makes them dependent on their mentor for protective practices. The ability to master protection is to be achieved with experience and membership amongst the profession of scientists. As new members become socialized into the scientific profession they become socialized into the professional approach to safety. This mode of learning and socializing reinforces the notion that safety is inseparable from science and that scientists are the sole experts.

Safety — or, as scientists see it, the collective ability to avoid contact between bodies and any substance that could cause changes to their biology — is a central concern, constantly conveyed and reinforced in the course of everyday work. It depends on the intimate knowledge of working materials, gained through years of training and practice. It is often obscure for non-scientists.

The bureaucratic approach to safety

Environmental management systems *(EMS)* have emerged as a major device for managing risk in complex organizations. For organizations operating under legal rules and licenses, the gap between formalized obligations and enacted performances can pose substantial financial or reputational risks. Environmental Health and Safety management systems are an example of such systems. Through specialized roles and standardized rules and procedures, they seek to make organizational functions and performances transparent, traceable and immediately visible to managers or auditors (Huising and Silbey, 2010). The safety equipment includes personal protective equipment or PPE (laboratory coats, gloves, safety glasses), dedicated apparatus (biosafety hoods, showers, containment doors and doorways). Safety systems have called for a redesign of the architecture and equipment of laboratories. Complex entry systems are designed to ensure the isolation and sterility of spaces such as radiating machines or animal facilities. Waste disposal streams and areas increase and become more complex. In redesigning the laboratory space, not only they encroach on a space previously dominated by the demands of scientific work but they also redesign scientific practices and challenge local knowledge. EMS rules are detached from contextual or epistemic knowledge. This legal, bureaucratic approach entails trust in the ability of formal and decontextualized rules to provide adequate protection. As a result, bureaucratic safety creates a set of tensions for localized safety knowledge derived from professional norms: the erosion of collective safety practices and threats to professional expertise.

Erosion of collectivity. Bureaucratic safety appeals to some laboratory members precisely because it renders them autonomous from collective practice, as the following account from a PhD student attests:

> *In a lot of cases, every chemical you order, it says wear goggles, wear gloves and in 90% of them, the vast majority of scientists would consider that way overkill. And it's hard for me to come into the lab and know which one is overkill and which one, they really are lazy about it and I should wear protective measures. So I generally wear my lab coat.*

This is the case in particular for newcomers and technicians who do not possess either the theoretical scientific knowledge required to fully understand scientific materials or the local knowledge required to handle them safely. Bureaucratic safety allows for more autonomy from senior scientists in the practice of science. It allows technicians to resist the social order of the laboratory. But this resistance to the professional order is also a departure from the collective effort to maintain a safe environment. It allows some member to defect from the carefully crafted collective performance of safety.

Threats to professional expertise. The array of materials and rules stemming from regulatory safety gradually redesigns the material arrangement of the laboratory and the practices related to it. Areas where scientists once navigated freely become secured with mechanisms forcing scientists to wear additional equipment before entering or exiting different areas. Routine gestures and tasks are modified to accommodate complex waste disposal systems. Highly repetitive tasks such as those involved in tissue culture require, not only mastering the complex and embodied practices of manipulating dishes, pipettes and tubes simultaneously, but also remembering where and how to dispose of supplies such as sharps, liquids, instruments to be sterilized or biological materials. Seemingly small additions become less mundane when one can spend up to six hours per day performing routine procedures involving these materials. Gestures become multiplied in a place where work is already intensively manual and routine and where competition dictates a constant search for reducing experimental steps. Finally, safety systems also redesign and reclaim the use of equipment that was once the privilege of scientists. Laboratory coats, vented hoods, laboratory benches that were previously under the sole authority of scientists (and symbolically part of their status), are now claimed by safety officers as part of their jurisdiction.

As safety systems gradually redesign scientific space and practice, they encroach upon and reshape scientific knowledge. Tasks previously dictated by the scientists' craft and learned through apprenticeship are now interspersed with regulatory procedures. Regulatory safety introduces rigidity that is perceived as unproductive and detrimental to the performance of safety and to the proper performance of scientific work.

Contentious interactions and the performance of safety

As a result, Med Lab is a site of ongoing contest over how to perform safety. Low-status scientists seek to mobilize and enforce bureaucratic rules while high-status scientists primarily mobilize professional norms and punish deviance from professional norms.

Introducing regulatory consciousness. Junior laboratory members tend to adopt and promote regulatory practices. Some members promote the use of protective equipment as a way to normalize the practice: **"**I don't have safety goggles so I steal S's. And I steal them maybe once, twice a week. I just think that if people in the lab wore them more often they'd get [used to it]." Because the adoption of bureaucratic practices is often stigmatized, members who desire to push them organize as small groups to support one another. For instance, two students and one technician supported each other in constantly wearing their laboratory coats at all times, despite derogatory remarks from other members. As a result of their collective effort, they stood against the push-back and engendered a sense of pride, as one student noted: "People walk in our bay and say "oh, people are wearing their *PPE*." But I don't care. We're the lab coat gang!" The promotions of regulatory rules are generally small acts designed to gain more autonomy. As they seek to make the regulatory approach to safety more "normal" or "accepted," technicians and newcomers also resist the normalization of the professional approach, they problematize it. While members promoting regulatory safety often do not have much influence beyond their own group, they promote talk about regulation. In short, they bring legal consciousness to the laboratory.

Defending professional knowledge. For experienced scientists, building responsibility comes from enforcing professional norms based on collective awareness and embodied practices. This is done through socialization in the professional way but also by delegitimizing bureaucratic practices. One fellow summarized this position when commenting on a bureaucratic rule that requires scientists to wear an additional, disposable laboratory coat when working with some viruses: "It is a *joke*! These are just things to make you feel better. How many layers do you need? It is more about how you bleach things." Wearing PPE at all times is heavily stigmatized. Comments shaming the practice abound such as the ironic prescription "Laboratory coats are for when you are cold." Newcomers are diligently taught that laboratory coats impede swift and skilled movements needed to perform fast and reliable experiments. Not wearing a laboratory coat is a sign of membership in the community of professional scientists who are in control of their environment.

Blending. *S*ome Postdoctoral Fellows seek to blend both approaches to improve current practices. In these instances, they seek to maintain the collective side of professional safety and the enforcement mechanism of bureaucratic safety. One instance of blending occurred as one Fellow sought to systematize the cleaning of the tissue culture room, a regulatory requirement. After obtaining agreement from several co-workers, she sent a collective email in order to organize the cleaning of the five biosafety hoods in the tissue culture room. She volunteered to clean the hood for retrovirus work, the hood that posed the most health and safety threat, as a way of getting the others to do the task. But more was involved than doing the dirty work: she also took on the work that was the most dangerous and required most expertise. This allowed her to present the task to her co-workers as part of professional, expert work rather than as a regulatory requirement. Other instances of blending included the selective enforcement of some bureaucratic rules by some senior members towards junior members, generally accompanied by a professional justification. Only Postdoctoral Fellows sought to organize such compliance with bureaucratic safety. They built on their authority as respected professionals but used the bureaucratic apparatus as an enforcement tool. In doing so they directed other member's aggravation toward the external bureaucratic apparatus, not themselves. In most cases, blending required a careful balancing act between enforcing bureaucratic rules and maintaining legitimacy as a professional scientist.

The performance of safety takes the form of ongoing contentious interactions as different groups mobilize different sets of rules. The mobilization of either set of rules constitutes small acts of resistance. Experienced scientists mobilize professional rules to resist bureaucratic encroachment by the university and its oversight system. Newcomers and technicians mobilize bureaucratic rules to resist the professional authority of scientists. Yet these contentious interactions are meaningful both for the penetration of the regulatory logic in practice and for the transmission of safety knowledge.

CONCLUSION

Micro-level approaches to tracing institutional arrangements. This work contributes to further examination of the fluid negotiation of legal and professional boundaries at the micro-level (McPherson and Sauder, 2013, Gray and Silbey, 2014). It affords a microscopic look at institutional trajectories within organizations. Many studies have shown that actors blend different institutional logics on the ground (Binder, 2007, McPherson and Sauder, 2013). Yet no consistent mechanism has emerged to explain why and how institutional frameworks are blended in practice. I argue that the mobilization or hijacking of external logics by professional actors is a consistent part of a professional struggle over the control of tasks. When competing institutions such as the law, threaten the integrity of professional authority, strategic blending enables to integrate and translate external rules within a professional jurisdiction. By decoupling legal knowledge from its carriers, professionals expand their capacity as institutional agents and their autonomy from external social constituents.

As regulatory templates become decoupled from their carriers, they become more embedded in practice, no longer attached to competing professions (regulators) that may be perceived as a threat. If we take seriously the law to be a use of state power for organizing social relations and producing specific conditions (Gray and Silbey, 2014), then unpacking and tracing the differential trajectories of the legal institution's components (e.g. normative templates, professional carriers) allows us to explore the micro-level processes through which the law operates within organizations, in practice and at a distance.

REFERENCES AVAILABLE FROM THE AUTHOR