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Promoting a Sustainable Academic–Correctional Health Partnership: Lessons for Systemic Action Research

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Abstract

In the United States, the phenomenon of mass incarceration has created a public health crisis. One strategy for addressing this crisis involves developing a correctional agency – academic institution partnership tasked with augmenting the quality and quantity of evidence-based healthcare delivered in state prisons and attracting a greater number of health professionals to the field of correctional health research. Using a Connecticut correctional agency – academic institution partnership as a case example, the present paper examines some of the key challenges encountered over the course of a 3-year capacity-building initiative. Particular attention is given to agency and institution characteristics both at the structural level and in terms of divergent stakeholder perspectives. The authors find that future partnership development work in this area will likely benefit from close attention to predictable sources of temporal variation in agency capability to advance project-related aims.

Introduction

U.S. prisons and jails are under a mandate to provide healthcare to persons in custody, and have come to play a vital role in delivering treatment to individuals who otherwise lack access to care. Nonetheless, mounting evidence shows that, on balance, the experience of incarceration adversely impacts health (Schnittker, Massoglia, & Uggen, 2011). For example, crowded living conditions facilitate the spread of infectious disease (Dumont, Allen, Brockmann, Alexander, and Rich, 2013). Incarceration may also increase sedentary behavior (De Viggiani, 2007) and obesity (Gates and Bradford, 2015).

Still, the most severe adverse health outcomes experienced by persons with a history of incarceration occur post-release. The stigma associated with having a criminal record, low employability, and profound socioeconomic disadvantage translates to poor access to primary care services. Repeated migrations between correctional and community habitations undermine continuity of care for persons experiencing chronic illness (Wang, Clements et al., 2012).

U.S. correctional facilities represent an important, if underutilized point of contact for reaching at risk individuals (Wang, Clements et al., Dumont et al.). However, as will be discussed, public health funding is typically disbursed for the purpose of targeting specific disease-states by supporting time-limited programs consisting, in many cases, of efforts to modify individual behavior or deliver treatment. The public health needs of the correctional population are not confined to a specific disease and are strongly impacted by a range of social determinants of illness.

With these issues in mind, the team members of the project described here sought to build a partnership between an academic institution and state correctional agency, with the aim of improving the health of the correctional population. It was reasoned that, in order for the partnership to be sustainable, it should be instrumental in securing a stable stream of funding from public health agencies (c.f., Schnell et al., 2013), and therefore, emphasis was placed on developing research infrastructure. Emphasis was also placed on fostering interprofessional collaboration, based on the understanding that strong relationships and shared goals among partners will also promote sustainability.

As will be discussed, challenges to developing a research infrastructure are many. Academic research partners face pressures to maintain a steady flow of publications and to adhere to grant timelines, which may result in “helicopter research” which, as described below, militates against lasting and trusting interprofessional relationships. Correctional agency staff members operate within a system where support for academic research is not a high priority, and the organizational structure is unamenable to efforts to achieve quality improvement in correctional healthcare.

Background

In this section, we briefly touch on reasons why, according to many experts, the level of public health funding available for addressing health problems prevalent in correctional populations may be inadequate to the need. This speaks to the need for a sustainable academic institution – correctional agency partnership and provides a context for the subsequent discussion of challenges we encountered in our efforts to strengthen a Connecticut-based academic institution – correctional agency partnership.

Mass Incarceration—Mass incarceration, coined by Garland (2001), refers to a rate of incarceration in the United States that is significantly elevated in comparison to other liberal democracies. Whereas the incarceration rate on the European continent varies from 50 to 100 per 100,000 residents, in the U.S., 743 per 100,000 are incarcerated). Persons who study social stratification and poverty find that the incarceration system has had a systematic effect on the life chances of poor, and in particular black, men. Thus, high school drop-outs of any race will have more frequent contact with law enforcement; yet, whereas white male drop-outs under the age of 35 are incarcerated at a rate of 12%, the figure among blacks is 35% (Western and Muller, 2013).

Funding Environment—Experts who study the intersections between mass incarceration and public health (e.g., Dumont, Brockmann, Dickman, Alexander, and Rich, 2012;

Schnittker et al., 2011), believe that the impact of mass incarceration on public health is underappreciated and that the level of funding and number of professionals working in this area are insufficient. It has been noted that, “Traditionally, incarcerated populations have been incorrectly viewed as isolated and self-contained communities with only peripheral importance to the public health at large (Rich, Chandler, Williams, Dumont, Wang, Taxman et al., 2014; p. 462).” It has only recently become clear that mass incarceration has in fact profoundly impacted the health of the wider community.

Pitfalls of Disease-Specific Funding—Consider public health expenditures devoted to combating the spread of HIV infection. Typically, the behavior of individuals is targeted for behavior change --condom use promotion and safer injection drug use being two examples of intervention foci. However, the profound black / white disparity in terms of prevalence of HIV in the U.S. is almost entirely attributable to mass incarceration and its disruptive effects on families (Roberts & Raphael, 2009).

Likewise, CDC investigators have asserted that though “individual risk behavior contributes to HIV transmission, it alone does not account for disparities in HIV/AIDS among Blacks in the United States. Behavioral studies must be complemented by studies that investigate how we affect deeply entrenched social determinants that contribute to and often create the foundation for ongoing HIV transmission (Sutton et al., 2009, s353).”

Roberts and Raphael suggest that the same transmission dynamics observed in HIV are also evident in the alarming spread of viral hepatitis, sexually transmitted infections other than HIV, and tuberculosis in minority communities. Even though these social determinants are not specific to a particular disease-state, the preponderance of public health funding programs are disease-specific. It is suggested that public health resources may be more effectively utilized by building capacity to study a wide range of public health problems that are exacerbated by racialized mass incarceration, using correctional facilities as a point of contact for otherwise hard-to-reach populations.

Partnerships to Inform Practice

NIH's short-lived RC4 funding program is one example of a departure from a disease-specific model. The RC4 program was supported by the *American Recovery and Reinvestment Act* (ARRA) of 2009. It was designed to “support multi-year funded research with high impact ideas that may ... foster new approaches to improve the interactions among multi- and interdisciplinary research teams; or, advance the research enterprise in a way that could stimulate future growth and investments and advance public health and health care delivery. This [program] could support ... the creation of a unique infrastructure/resource designed to accelerate scientific progress in the future (<http://grants.nih.gov>).”

The project described here was supported by RC4 funding. The Principal Investigator sought to develop infrastructure to facilitate the process of securing funds for correctional health research. As noted above, “research infrastructure” is in part defined by lasting interprofessional, collaborative relationships. The term also encompasses (1) efforts to streamline the process by investigators gain access to correctional populations, (2) educate

investigators on procedures that are specific to correctional settings, and (3) attract new investigators (c.f., Kilbourne, Neumann, Waxmonsky, Bauer, Kim et al., 2012).

Nonetheless, even a partnership between academic researchers and state agencies is established, stakeholders may experience unexpected difficulties in achieving the sought-for benefits of collaboration (Feldman, 2010). The theory and praxis of achieving a productive collaboration remain underdeveloped areas of research (Israel et al., 2010). One aim of the present paper is to delineate some of the sources of these difficulties.

The project discussed here is called *Partnerships to Inform Practice* (PIP). At the inception of the PIP project, expert and peer opinion was solicited from an assembly of 40 *Connecticut Department of Correction* (DOC), *University of Connecticut* (UConn), and *University of Connecticut Health Center* (UCHC) representatives. UCHC is a contracted provider of correctional healthcare services. Representatives included administrators, staff, correctional health advocates, and researchers. These leaders endorsed the broad aims of reducing recidivism, improving the health of the correctional population through wider adoption of evidence-based healthcare practices, quality improvement initiatives, and workforce capacity-building.

Additional aims were also identified: (1) strengthening collaboration with respect to identifying agreed-upon correctional health care priorities; (2) developing strategies and resources to aid in attracting funding for practice-based research (see below); (3) reducing organizational barriers that discourage investigators and clinicians from pursuing correctional health research and practice; and (4) improving electronic data-sharing among state agencies that provide case management, substance use and mental health treatment to current and former inmates. The latter is particularly important in terms of studying the social ecology of current and former inmates as they navigate fragmented systems of care and derive varying levels of benefit from these systems. It was agreed that achieving these aims would increase the capacity of PIP to attract research funding on a continuing basis.

Stakeholders agreed that research stimulated by PIP should focus on delivering concrete benefits to the correctional population. As a result, attention was turned to developing infrastructure in support of *practice-based research* (i.e., research which supports improvements in clinical practice, augments the direct provision of care, or influences public policy; Tierney, Oppenheimer, Hudson, Finn, Hickner et al., 2007).

Diversity of Stakeholder Groups

Partnership development requires an appreciation of the diverse needs of stakeholder groups as it bears on the aim of fostering shared objectives. Here, brief attention is given to (a) the correctional population, (b) public health investigators, and (c) correctional agency personnel.

The Correctional Population—Inmates are passive recipients of healthcare delivered in prison, but when they enter the community, are expected to take an active role in managing their own chronic healthcare needs. This expectation may be unrealistic in light of former inmates' competing needs to find housing and income. In many instances, formerly

incarcerated persons fail to obtain necessary medications and treatment or fail to adhere to recommended chronic illness management regimens (c.f., Wolitski, 2006). In fact, 1 in 12 formerly incarcerated persons are hospitalized within 90 days of release owing to, among other things, complications of diabetes mellitus, chronic obstructive pulmonary disease, asthma, hypertension, dehydration, bacterial pneumonia, and congestive heart failure (Wang, Wang, & Krumholz, 2013).

The decades-old “War on Drugs” has had a dramatic impact on racial disparities in incarceration. In brief, even though blacks are as a group less likely to be drug users than whites, their drug use is far more likely to be detected by police (c.f., Gelman, Fagan & Kiss, 2007; Ridgeway & MacDonald, 2009). The drug-related incarceration rate of black adults is 256.2 per 100,000 as compared to 25.3 per 100,000 for white adults -- a tenfold difference (Fellner, 2009). Roughly 1 out of 9 black men between the ages of 20 and 34 is incarcerated at a given point in time (Pew, 2008).

Reducing racial/ethnic health disparities figures prominently among the aims of numerous federal public health funding agencies (e.g., *National Institutes of Health*, [NIH], 2015). Efforts to stimulate funding to address correctional health problems would benefit from demonstrating the extent of the impact of mass incarceration on health disparities. Yet, paradoxically, the sheer scope of the problem presents challenges for investigators. “Incarceration has become pervasive among recent cohorts of low-educated black men. With lifetime risks of imprisonment of around 70 percent, the added risks of jail incarceration, probation, criminal conviction, and arrest would make criminal justice involvement nearly universal for this group (Western and Muller, p. 183).” This speaks to the need for cross-disciplinary collaboration, both to develop innovative research methods and to increase the visibility of this problem.

Public Health Investigators—When contemplating correctional health research, new investigators may be wary of correctional agencies' unfamiliar rules and bureaucratic hurdles. These concerns are made especially salient by the requirement to adhere a grant-dictated timeline. Owing to prisoners' status as a vulnerable population, research involving prisoners invokes additional layers of administrative burden involving Institutional Review Boards (IRBs; Boghossian et al., 2012). Also, as stated above, public health investigators operate in funding and academic environments which continue to privilege disease-specific programs of research, with the result that research on improving correctional systems of care remains neglected.

Respecting established correctional health investigators, they – like many academic researchers -- face pressure to demonstrate an ability to secure grant funding and publish research in peer-reviewed journals. Targeted funding that is available at a particular point in time may not support an investigator in pursuing a programmatic research agenda, and instead create an economic incentive to move on to a new area of inquiry.

This creates perverse incentives for investigators to engage in activities which undermine the trust of community partners. As noted in Flicker et al. (2007), “commonly, researchers do little to build capacity within communities. Some scholars have referred to this

phenomenon as ‘helicopter research,’ a term derived from the practice of researchers flying into and out of First Nations communities — arriving with surveys, taking data, and giving little, if anything, back (p. 479).” Increased investment by NIH in community-based participatory research is designed to reduce future recurrences of helicopter research, but community members and correctional agency personnel may nonetheless retain a “healthy paranoia” toward researchers (Horowitz et al., 2009). As will be discussed, this issue is relevant to the present discussion.

Correctional Agency Personnel—Correctional health investigators depend upon the cooperation of correctional agency staff members. As noted in an invaluable overview provided by Freudenberg (2007), “Correctional officials need to approve and at least not oppose any research study conducted in their facility. Their main concerns are the extent to which research may pose a threat to safety and regular prison routines, fear of bad publicity, cost and liability concerns, or additional demands on their staff (p. 419).”

In this paper, “core functions” will refer to correctional agencies' mandate to ensure safe operations, which in corrections is synonymous with maintaining established routines. The organizational emphasis on routines flows from the pervasive influence of Weberian scientific management principles on the organizational design of correctional agencies (see Table 1).

State departments of correction exemplify *safety cultures*; in a safety culture, a high premium is placed on protecting correctional officers (COs), inmates, and the public against the risk of harm (Grote, 2007). Features of safety cultures include, (1) *preoccupation with failure*, i.e., alertness to the possibility that any incident can mushroom into a crisis required a coordinated organizational response, (2) *reluctance to simplify*, given the understanding that redundancy and multiple levels of review are instrumental to maximizing safe, reliable operations, and (3) *sensitivity to operations*, manifesting as a close attention to operating procedures (National Institute of Corrections, 2012).

Systemic Action Research

Action research, in this paper, will be defined as “comparative research on the conditions and effects of various forms of social action, and research leading to social action (Lewin, 1946; p. 35).” When action research occurs in the context of program evaluation, evaluation may be defined as an activity which provides “a basis for action in the future” with the aim of improving a program or practice (Deming, 1976; p. 60).

Systems—Systemic action research proceeds from an awareness of the system properties of organizations (Flood, 2010). A complex system is understood as a lattice of interactions among subsystems, and the outputs and outcomes of the system depend on non-simple, temporally extended and asynchronous interactions among subsystems (c.f., Bak et al., 1987; Simon, 1962).

Critical Systems Thinking—Critical systems thinking involves “surfacing and questioning assumptions and values inherent in any systems design (Flood, 2010, p. 279).” These assumptions and values will likely manifest as *theories of action* held by actors within

a system. These are “if-then” propositions relating to purposive activity. For example, participants within a system will likely have divergent beliefs regarding the efficacy of various *modes of action* (e.g. negotiation strategies, policy interventions, or personal initiatives) for achieving a desired end. They will also have beliefs regarding likely barriers that will arise once a mode of action been implemented (c.f., Pawson, 2013).

Action—Abductive reasoning may be understood as “a search strategy which leads us, for a given kind of *scenario*, in a reasonable time to a most promising explanatory conjecture which is then subject to further test (Schurz, 2008, p. 205).” Abductive reasoning characterizes the Lewinian conception of action. One begins by posing the question, “what are achievable aims that will improve correctional health research infrastructure?” To answer this question, one must first have in mind a scenario based on certain assumptions. One assumption is that different stakeholders will have different theories of action for improving infrastructure, necessitating a series of discussions aimed at adjudicating and learning from multiple perspectives.

A second assumption, as alluded to earlier, is that concepts such as safety culture and Scientific Management Theory accurately characterize the operation of state departments of correction. This is a largely noncontroversial position: a strong hierarchy is evident, in which personnel are expected to respect the chain of command and adhere closely to established policies and procedures. Organizational researchers have observed that strong hierarchy, when coupled with functional specialization by department, creates an environment in which vertical accountability is strong but horizontal accountability is weak (c.f., Schillemans, 2011).

Consistent with the abductive style of research employed in this project, additional working assumptions were generated in the course of project-related iterative data-gathering, literature review, and interpretation. As will be described below, these working assumptions are that political factors, micropolitical factors, and pronounced capacity constraints characterize the correctional agency system and are germane to identifying practicable courses of action for partnership development.

Political Factors—“Political factors” refer to state and federal political processes, media-driven agenda setting, and the 2- and 4-year election cycle. A change in administration may impact agency performance by reducing or increasing its budget. However, the disruptive effects of changes in administration can be more profound. What had been a high priority program or initiative in one administration may become a low priority in the next; an early retirement program for state employees may lead to widespread departures of the most experienced personnel, entire programs may be eliminated, and agencies reorganized (c.f., Sosin et al., 2010).

Micropolitical Factors—“Micropolitical factors” refer to inter- and intra-organizational interactions. The aspects of micropolitics which present themselves within a state agency are partly attributable to organizational *segmentation*; that is, a structure consisting of functional specialization by department, which has the effect of splitting organizational processes into component tasks (Kanter, 1983; Schaefer & Fasell, 1988). As will be discussed, this leads to

agency loss (defined below), diffusion of responsibility, and duplicative effort. Over-specialization exists when there are too few specialists to fulfill the aims of the organization in a timely and effective manner (e.g., Abrams & Berge, 2010). Specialization may also be understood as a defensive tactic employed by staff-members, insofar as persons who claim exclusive expertise often have increased job security and opportunities for advancement (Ting, 2009). This in turn leads to increased territoriality or “turf” issues.

Owing to these issues, competition among departmental representatives and decision-makers will be evident even when they agree to undertake a cooperative venture such as meeting to discuss improvement-oriented organizational development strategies. Competition is observed in efforts by individuals to secure or preserve control over finite agency resources, the attribution of blame or responsibility for correcting problems within the organization, and *preference divergence* (i.e., differences in priorities reflecting the particular personal ambitions of team-members or loyalties to a particular department; c.f., Friesl et al., 2011; Head & Alford, 2013).

Pronounced Capability Constraints—State agencies, like other organizational forms, exhibit varying degrees of *organizational capability* (the ability to achieve existing aims in the present), *dynamic capability* (the ability to adopt and institutionalize new aims for the future) and *absorptive capability* (the ability to learn from and collaborate with external partners; Camisón & Fóres, 2010; Helfat & Winter, 2011). Below, attention is given to factors which limit these capabilities, including (1) agency loss, (2) turbulence, (3) rigidity, and (4) susceptibility to exogenous shocks.

Methods

Because agency partners had full-time work commitments and only a limited number of hours to dedicate to the project, their participation was limited to their attendance at quarterly project meetings and a finite number of additional hours for consultation. This precluded the use of interviews and survey instruments in support of project evaluation. This led to the adoption of *open transcription* as the primary means of collecting evaluation data. Open transcription refers to the recording of verbal and gestural communications as they occur (Jenks, 2011). Transcripts were completed for all quarterly project meetings. Transcripts were analyzed using conversation analysis and transcript analysis techniques, which place emphasis on documenting intonation (e.g., certain words being stressed by a participant in the course of a conversation), interruptions, and duration of speech episodes. These analyses were supplemented by team reviews of progress indicators in relation to the project timeline.

Results

The concept of agency loss will be introduced using illustrative examples. The PIP project director saw an opportunity to develop infrastructure to reduce burden on DOC's finite grant support capability. If agency staff members were able to trim the number of steps involved in processing grants and contracts, they could process grants and contracts more quickly and with a reduced expenditure of resources, even if the volume of incoming grants and

contracts were to increase. In reality, each step involved in processing grants and contracts is dictated by one or more administrative directives (A.D.'s). Deviation from policies contained in these directives is prohibited, and moreover, because there is a degree of ambiguity regarding what constitutes a deviation, there is a level of risk-aversion extending to procedural changes that are not deviations but could be construed as such by other members of the agency. As A.D.'s reference one another, a change in one A.D. might require a review and revision of multiple A.D.'s. Each change would have to pass through layers of agency approval extending all the way up to the agency commissioner.

Turning to a second example, one aim of the PIP project was to increase protected access by authorized researchers to electronic inmate data. Access could be increased by means of upgrades to the database architecture and financial support was available through PIP project funding. Improved access would have reduced burden on the agency *Management Information Systems* (MIS) staff who currently provide the data to researchers. However, completing the upgrades would require both a substantial investment of MIS staff time during the transition and result in ongoing maintenance costs. Strategies for recouping the ongoing costs were advanced but, as will be discussed, problems of interdepartmental coordination stood in the way of adopting the strategy.

DOC captures large volumes of data on inmate movements and healthcare but has limited capability to analyze the data. One PIP team member stated, "I have a standing stump speech for any agency: what we need is a transformation in which information is seen as essential to decision-making, then there will be reconfiguration of resources – we spend too much money collecting data with absolutely NO PLAN [emphatic] for how to use it (10/2011)." This speaks to the question of DOC's dynamic capability, particularly through the use of evidence to guide improvement.

The term "agency loss" refers to the gap between potential and realized organizational performance resulting from segmentation and delegation of tasks. This manifests in situations where a single task must be handed off to multiple persons or departments before it can be accomplished. In safety-oriented and heavily regulated organizations – among which, one may count state departments of correction -- authorization to enact changes in policy and procedure will often require review and approval from multiple signatory authorities (Reason, Parker, and Lawton, 1998). Each hand-off may result in a delay which may last for hours, days, or weeks, and if multiple hand-offs are necessary, these delays will become cumulative. Delays are likely because a signatory may only be available on certain days, and will only process documents in the order received. Staff reductions, work backlogs, and reassignment will impact the number and availability of persons with the required approval authority.

Managerial control also increases under conditions of fiscal stress. MIS staff and other DOC informants were unanimous in their stated belief that fiscal stress contributed to a steady increase in routine workload and, in turn, greater difficulty meeting PIP project requirements. There is no simple, objective answer to the question of whether, in comparison to other states, Connecticut's DOC is underfunded. The sufficiency of a budget, in terms of the agency's ability to achieve its aims, is contingent on the overall effectiveness

of the organization, whether the budget is predictable, and whether expectations regarding organizational performance are stable. Budget cuts and reorganization, particularly when they occur precipitously in response to revenue shocks, disrupt organizational performance. Organizational capability to continue performing basic functions is reduced, and it becomes necessary to increase the number of managerial controls to minimize the risk of incurring departmental budget deficits. At the same time, however, enacting and complying with managerial controls each consume organizational resources, and further deplete organizational capability (Hou & Moynihan, 2008).

Effects of Agency Loss on Research—Of particular concern to the academic partners involved in PIP was administrative delays impacting investigators' ability to adhere to federal grant submission timelines. These delays owe in part to DOC's *Research Advisory Council* (RAC), which is required to review all applications. The RAC is comprised of DOC representatives who have limited availability; hence, deciding on times to meet can be challenging. If applications are incomplete, the RAC may request additional information and not have the opportunity to review the additional information until the next time it meets. Information on what constitutes a complete application is not made readily available to researchers and different agency contact persons may have different criteria for deciding what constitutes a complete application.

The process by which DOC authorizes a grant research can be held up by one person and without cause for several months (c.f., Wakai, Shelton, Trestman et al., 2009). This concern was raised at project meetings. It was suggested that DOC provide new investigators with a realistic estimate for the amount of time it will take to approve research projects. This suggestion was rejected. One DOC team member commented, “It is not cut and dried. The application – depending on what warden it is going to – it may depend on hearing back from the warden.” A second commented, “I am SO [emphatic tone of voice] hesitant about timelines because there is so much we don't know. We have to be fair.”

A DOC staff member who was invited to speak at a team meeting commented that, “if a commissioner is not able to sign off for a week or two, you will have to wait a week or two (7/2011).” In fact, delays longer than a week or two are possible. A DOC team member said, “you have this thing [research application] approved [by RAC]... the IRB is done ... all your ducks are in a row ... and when the next executive committee happens, it might not hit the agenda ... so one does not know *how* or *whether* it will get back to the commissioner (11/2010, emphasis added).”

The PIP project required cooperation from multiple outside agencies, and each agency had its own IRB. Just as was the case with the RAC approval process, IRB members at the various agencies had limited availability. Some agencies, still affected by the disruptive effects of a recent gubernatorial election and subsequent reorganization, had suspended IRB meetings indefinitely.

Turbulence

Organizational turbulence, according to Boyne and Meier (2009) describes a situation in which an organization's capability to achieve its intended aims falls below optimal levels and can be attributed to the suddenness, frequency and/or amplitude of unexpected changes within an organization. It will be emphasized, however, that changes need not be unexpected in order to produce turbulence and that events can create turbulence before they have taken place. That is, anticipation of a gubernatorial election can trigger a slowdown in productivity, particularly in relation to dynamic and absorptive capabilities. This will be discussed in connection with exogenous shocks.

Rigidity

As Gittel (2002) has noted, "Routines facilitate coordinated action by prespecifying the tasks to be performed and the sequence in which to perform them. Routines capture the lessons learned from previous experiences, enabling a process to be replicated without reinventing the wheel (p. 1409)." Thus, adherence to routines is beneficial and essential to an organization. Rigidity, however, exists when it is time-consuming and difficult to modify "previously institutionalized routines and practices" in the face of emergent needs (Rawley, 2010, p. 873).

Gittel also notes that routines, by design, reduce the need for coordination among organizational staff members. As a means of disseminating information, reliance on routines is a *low-bandwidth* strategy, referring to the amount of information that is propagated across organizational units. This is protective against disruptions that may occur as a result of staffing changes. However, any movement toward increased collaboration will require increasing bandwidth, and by implication, new processes and procedures to sustain the increased flow of information.

Barriers to coordination exist in many organizations. In health care practice settings, experts have observed barriers to implementing patient-centered evidence-based practices (EBPs). In one study, respondents noted that lack of cooperation on the part of colleagues hindered their own ability to adhere to these practices. Respondents said that colleagues displayed a lack of interest in innovation, territorial thinking, and a preference for adhering to well-tested routines (i.e., following general clinical practices) as opposed to more novel EBPs (Josefsson, Kammerlind, & Sund-Levander 2012). As will be discussed, rigidity may also be viewed as a symptom of, or contributing factor to, defensive organizational behavior.

Exogenous Shocks

Exogenous shocks are either unexpected or unpredictable occurrences emanating from outside an organization. State agencies are prone to shocks that are political and/or budgetary in nature.

The first year of the PIP project coincided with both a gubernatorial election and a state budgetary crisis. High-level PIP project partners retired or were reassigned and correctional facilities were slated for closure. A pre-election slowdown in PIP-related activities occurred; PIP team members who worked for the agency were wary of making commitments to the

project, knowing that a change in their professional responsibilities or assignment could occur that would preclude their ability to follow through. Moreover, they did not want to take on additional responsibilities in the event that they would be required to commit time and resources to unidentified but high-priority tasks which – based on past experience with election-cycles – they believed would be likely assigned to them during the post-election transition.

The election did indeed usher in new tasks and team member reassignments. Among team members who were able to remain a part of the PIP project, the work requirements to train their replacements and familiarize themselves with their new responsibilities left them with less time to devote to fulfilling agreed-upon roles relating to the project.

As a consequence of staff turnover and reassignment, academic institution – agency collaborations may dissolve. One academic institution partner recounted, in relation to an NIH grant that had been submitted with correctional agency personnel listed as key investigators, “everything written in that grant, every person, changed” following an election cycle (12/2010).

In terms of election cycle effect on internal operations, a DOC partner described an unwillingness to train a new employee because the department head to whom they both reported was newly appointed. “I don't want to say [to a trainee], ‘there is someone new in the position and this is how they do it (7/2011).’” The productivity of the new employee was limited until the expectations of the new department head became clear.

As stated by one informant and PIP team member, “With every change in leadership, there are changes we have to adapt to. We have to make decisions as an agency, to understand what we are doing and why we are doing it (7/2011).” Changes in leadership may require abandoning initiatives that had begun under the prior administration. To offer a concrete illustration, one DOC team member recounted that “literally years [were] spent on developing a practice model for residential halfway houses. From that we developed real ways to help people, but then the thing died – financial pressure, budgetary [concerns] – things out of [our] control (12/2011).” Thus, one manifestation of straitened organizational capability is the jettisoning of non-core activities when priorities change, even if it means sacrificing sunken investment and failing to utilize new knowledge.

Public agencies are placed under the expectation that they fulfill their core functions at a constant level regardless of changes in budget, workload, or staffing. They are also expected to respond to a succession (or queue) of demands of varying levels of urgency, and legislative or judicial mandates are imposed with deadlines. One may anticipate bottlenecks when level of demand exceeds the organization's capability to respond efficiently. Demands will regularly enter the queue ahead of improvement-oriented activities or any activity that has value but lacks urgency, and as a result, these activities may remain in the queue and either fail to advance or slip further back (c.f., Beer and Eisenstat, 2000; Sosin, Smith, Hilton and Jordan, 2010).

Even though it is intuitively compelling to suppose that high-level support for an improvement project would improve the project's chances of success, high-level leaders are

under particular pressure to focus on only the most urgent demands placed on the agency. Moreover, the political election-cycle increases the likelihood that high-level leaders who are supportive of an improvement project will be periodically replaced by leaders who are less familiar with, and may be less supportive of, the project. These observations may help make sense of one expert informant's response, when asked how improvements are achieved at DOC: "we get things done by staying under the radar (2/6/2011)." Improvement-related activities remain viable provided that they consume few resources; if these activities consumed a substantial portion of professionals' time and effort, the activities would be more visible, and high-level decision-makers would be more likely to divert the resources to crisis management activities.

Summary: Factors Limiting Organizational Capability

To summarize some of the observations made thus far, turbulence may be usefully understood in terms of demands on the organization's finite capabilities, where anticipation of disruptive events and post-event adjustments may each impact organizational effectiveness. By implication, resources directed away from organizational core functions will generate a backlog of activity, and addressing the backlog will also consume resources. Post-election reorganization may also create emergent demands on agency staff members. These concepts are portrayed schematically in Figure 1. This is significant in terms of the timing of an improvement project. If predictable events such as those tied to the election cycle create turbulence, timing the start of an improvement project to avoid an election season or at least anticipating election-cycle disruptions will likely increase the speed with which project-related aims can be achieved.

Manifestations of Limited Capability

In this section, a tentative typology will be offered, identifying areas where limits on dynamic and absorptive capability were observed in connection with the PIP project. These include, (1) intra-institution and inter-institution competition, (2) low inter-agency and agency-institution (or *extramural*) coordination, (3) low intra-agency horizontal coordination, and (4) low intra-agency cross-level coordination. Also relevant are factors relating to agency climate. Findings relating to the adverse impact of helicopter research on agency-institution trust and the adverse impacts of agency climate will also be presented.

Intra-Institution Competition—PIP project plans were complicated by the inauguration of a grant-funded project awarded to investigators who had no connection with PIP but shared a similar aim of streamlining access by researchers and state agencies to electronic data. The prospect of collaboration was discussed, but the idea was rejected for reasons that were not clearly articulated. One plausible conjecture is that the competitive nature of funded research creates a disincentive to collaboration. The scientific enterprise, particularly in a climate of increasingly scarce grant dollars, is "characterized by competition for priority, influence, prestige, faculty positions, funding, publications, and students (Anderson et al., 2007; p. 438)." Anderson et al. point out that, given the scarce supply of funding and recognition, a tournament mentality arises in which even small differences in relative advantage are vigorously contested.

The existence of competing projects placed increased demand on DOC resources. One DOC team member pointed out the redundancy. In response, another team member responded, “overlap is our main product.” A second saw it as indicative of “silo problems (12/7/2010).”

Also, despite its close involvement in the PIP project and affiliation with UConn, the contracted correctional healthcare provider (UCHC) was unable to fulfill its commitment to provide increased access to correctional healthcare data. This problem arose despite the fact that the PIP project (1) made funds available to cover the initial costs of implementation, (2) addressed federal regulatory concerns regarding the de-identification and appropriate use of protected health information, and (3) made the case that institutional investment would yield long-term returns in terms of increased ability to successfully compete for grant funding. This outcome was attributable in part to a lack of clarity regarding the amount of investment made by both DOC and UCHC, and by implication, which of the two organizations would reap the greater benefit in terms of the projected (and admittedly speculative) increase in grant revenue. One observer noted, “They [stakeholders within UCHC] are waiting to see ‘who is the primary owner?’ That’ll decide who pays [for the service] (12/2011).”

Inter-Agency and Agency-Institution Coordination—The project aim of integrating data on inmates' post-release healthcare and social services utilization required gaining the support of state agencies other than DOC. However, each state agency is subject to many of the same issues of segmentation, agency loss, and turbulence. One PIP team member reported, with regard to one of these outside agencies, that it “is juggling a lot of priorities” and that they (the agency) “lack space, time and information to take on additional projects (12/2012).”

Obviously, it is advantageous for improvement projects to build, at an early point in the process, trust relationships with representatives of partner agencies. One team member reported, “the relationship with [agency] leadership can be sticky sometimes ... I found that if the person who is really invested in research [in that agency] does it [make the presentation] ... the agency is less resistant to cooperate in terms of sharing electronic data (2/2011).”

Inter-agency collaboration is likely to be particularly susceptible to obstacles relating to preference divergence. To provide a hypothetical example using an agency that was *not* approached by PIP project team members, the *Connecticut Department of Children and Families* (DCF) oversees children and families will have clientele who are involved in the correctional system. It is recognized that the health and safety of children is compromised by familial criminal justice involvement (c.f., Dallaire, 2007; McLanahan, 2009). However, the core functions of DCF are remote from those of DOC. Thus, even though overlapping interests exist, the case for collaboration may not be strong enough to overcome concerns about the resources required to share data between DOC and DCF.

Intra-Agency Horizontal Coordination—Pursuant to the aim of increasing new investigators' ease of access to the correctional system, PIP team members agreed that information relevant to investigators was not easily accessed using the DOC website. A mock-up website was designed, which provided a convenient point of access for all DOC

research policy-related and instructional material. Scattered policy statements (i.e., governing admissible types of research, safety protocols, etc., the prohibition of recording equipment at correctional facilities, and summaries of relevant A.D.s) were compiled into accessibly-worded fact sheets.

However, many of the persons responsible for keeping the various information sources current and for deciding what information is made publicly available occupied the same level of the organizational hierarchy. Barring a directive from someone operating at a higher level of decision-making authority, increased coordination would only occur on a voluntary basis. This illustrates the concept of *horizontal coordination*: that is, collaborative action among persons at the same level of the organizational hierarchy.

Intra-Agency Cross-Level Coordination—The PIP team agreed to pursue an effort to educate staff members at various levels of DOC on the merits of correctional research and opportunities to participate in research as partner investigators. However, even high-level decision-makers at DOC defer to the decisions of facility wardens, and some wardens were more willing than others to support informational seminars within facilities. Hence, the term “cross-level” is introduced to convey the idea that higher level personnel are restricted in terms of interactions with lower level personnel who do not report to them directly.

Helicopter Research

Several DOC team members expressed dissatisfaction regarding their past experiences with academic researchers. The most salient source of dissatisfaction was the perception that correctional researchers exhibit behaviors characteristic of helicopter research. One team member commented, “We get a lot of things [applications] where people want to do research. What do we get out of it? Like, what happened? What did we learn? DID WE ACTUALLY GET ANYTHING OUT OF IT [emphatic]? I do not see the department [DOC] getting any benefit (10/2011).” On another occasion, a team member related the words of a warden who said, “I have got one [a research project] in my facility and I am waiting for it to get over with (11/2012).” DOC personnel on a number of occasions intimated similar impatience with ongoing facility-based research projects. Research places burden on wardens, who are responsible for assigning escorts to academic researchers and assembling inmates at a location where the research can take place. Researchers' failure to inform wardens of the benefits of research, particularly when combined with wardens' experience of stress or overwork, likely contributes to wardens' negative attitudes toward research.

A team member, while speaking in praise of the PIP project, revealed general dissatisfaction with the conduct of other grant-supported projects, saying, “I don't feel like this is one of those grants where you [investigators] walk in, do a little bit of something, and leave. *People are so sick of that*. This is different, changes in relationships are happening, people are informed, [and are] doing things differently (11/2012).”

A lack of understanding of the benefits of research may also contribute to negative attitudes toward research; one team member noted, “the concept of research and evaluation is still fuzzy for some people and they're not treating it kindly yet -- the use of DATA [emphatic],

people understand that (10/2011).” In other instances, projects may in fact be focused on academic knowledge generation and boosting academic careers rather than providing value to DOC. As DOC staff members prioritize their time based on the perception of a project's value to DOC, projects that are perceived to be of low value may be subjected to delays. One team member observed, “There was a time when the [approval] process took so long that the funding [opportunity] disappeared (3/2012).”

Agency Climate

Agency (organizational) climate is defined as, “the shared perceptions of and the meaning attached to the policies, practices, and procedures employees experience and the behaviors they observe getting rewarded and that are supported and expected (Schneider et al., 2013; p. 362).” This construct closely resembles that of a psychological contract, referring to each employee's perception of which aspects of occupational performance are most valued by the agency, and the perceived relationship between performance and fulfillment of personal career-related needs (c.f., Ramamoorthy et al., 2005). If an employee believes that close adherence to standing policy and procedures will lead to personally valued outcomes such as increased job security, recognition, and advancement, he or she may become a vigorous champion of the *status quo*. To the extent that these beliefs are widely shared, it influence the overall climate.

Innovation—Some employees may be committed to innovation and improvement regardless of whether these aims are valued by the organization. Innovative work behaviors are “purely discretionary” “extra-role behaviours” that “are not formally recognized by organizational reward systems (Ramamoorthy et al., p. 143).” If innovation and quality improvement are not valued by the organization, it follows that innovation and quality improvement outcomes are most likely to be achieved by committed individuals who remain “under the radar.”

Chain of Command—Some DOC staff members are reluctant to even discuss innovations without the explicit authorization of the persons to whom they report. During one meeting, a DOC staff member expressed reluctance in this regard, and a second staff member offered the reassurance, “we know where you are right now -- you don't want to do anything that will disrespect them [the supervisor] (7/2011).” More generally, the PIP project evaluator found it necessary to offer strong assurances of confidentiality to encourage staff members to brainstorm potential innovations.

Defensiveness—Fiscal stress also exacerbates defensive behavior or *turf wars* (Ashforth & Lee, 1990). Heads of each organizational unit are placed under increased pressure to protect or augment increasingly scarce unit resources to ensure sufficient capability to fulfill the department's core functions. DOC staff members referred to the work environment as “the system,” i.e., “the correctional system.” One team member commented that, “if you are in the system, you have a limited world view.” There are “different bubbles that people live in (11/2010).” At another point, a DOC team member commented, “there are folks in facilities who want to sabotage [innovations] it is painful to watch (12/2010).”

These conditions give rise to what Argyris and Schön (1979) termed “Model 1 Behavior.” This describes an environment in which the aims of staff members revolve around maximizing personal gains (or gains to one's own department) and minimizing costs (e.g., increased workload, increased accountability, or increased risk of negative evaluation by superiors). Individuals enter discussions with agendas which advance their interests. This militates against questioning one's own assumptions or meaningfully engaging with individuals who are pursuing different agendas. Consequences, according to Argyris and Schön, include miscommunication, mistrust, protectiveness, and limits on the extent to which each staff member learns from the experiences of others. These behaviors are learned over the course of one's professional tenure, in that staff members are rewarded on the basis of strengthening their own position or that of their department. In contrast, “Model 2 Behavior” relies on using evidence-based, unbiased information and committing to shared objectives. These actions lead, in turn, to reduced defensiveness and increased organizational learning.

Burn-Out—Burn-out has been described as a multi-dimensional construct comprised of *exhaustion* (the feeling of being unable to offer more of oneself in terms of taking on added responsibilities or applying additional effort), *inefficacy* (pessimistic assessments of one's own ability), and *cynicism* (a hostile or indifferent attitude toward work; Montero-Márin, Skapinakis, Araya, et al., 2011). Rather than viewing burnout as a personal disposition, Montero-Márin et al. find that this phenomenon is more likely to occur in organizational environments which reward close compliance with procedures and either fail to recognize or punish personal initiative on the part of employees.

To provide an example, a DOC team member complained that front-line staff members were unwilling to support an in-house quality improvement initiative, “because they can't see past the one day of their job [to take on new responsibilities] (12/2010).” When the PIP project's aim of improving the process for handling research applications was explained to one employee, the reaction was, “we are going to keep doing what we are doing, SO WHAT [emphatic] (10/2011)?”

A team member commented, with respect to colleagues' willingness to take on new projects, “there are [always] so many projects coming on, but everybody is in their little fiefdom. They'll say, ‘it'll take 9 years so why bother (11/2012)?’” Another DOC team member observed that “there are people who do not want to change – NO MATTER WHAT [emphatic] (3/2012).”

Excessive Mobility of Management—It has been noted that staff turnover and reassignment is problematic in terms of achieving intra-agency objectives and in terms of collaborations between the agency and academic researchers. This issue was raised in connection with team members' past experiences with, and negative appraisals of, political appointees. Because changes in leadership usher in changes in agency priorities, policies, and procedures, “everything in corrections” as one DOC team member phrased it, “is here today gone tomorrow (3/2012).”

Products of the PIP Project

The tangible products of the PIP project consist of a number of small improvements which, it is expected, will have a measurable impact on the amount of time it takes for DOC to approve investigator requests to conduct research at DOC facilities. The project also yielded recommendations that potentially could have been carried forward to the stage of policy implementation were it not for unforeseen problems of coordination and the limiting 3-year period of grant support.

Gains in Expertise—Here, “expertise” refers specifically to knowledge that is relevant to a particular field or context, and is only generalizable to a certain point beyond a particular project. Correctional health research expertise among PIP project personnel increased over the course of the project. To offer one illustrative example, insights were gained regarding the composition of the data stored in electronic health records. If an investigator were to seek records pertaining to inmates with diabetes, he or she may fail to anticipate the fact that medical diagnosis is not routinely stored in electronic records. As one team member reported, “... in the case of diabetes, because you don't have a diagnosis ‘x’, you have to say, these people have a [certain] medication [such as insulin], and therefore these people have diabetes (5/2011).” An agency team-member who evinced a strong interest in improving diabetes care for inmates reported that staff-members at one facility initiated a practice of logging diabetes cases on paper records as a means of better coordinating the care they provide.

This may come as no surprise to investigators familiar with research using administrative data. However, it illustrates a potential stumbling block for new investigators, and the utility of a sustainable partnership as a repository of practical knowledge. It also highlights a potential area for improvement: maintaining a database which includes diagnosis would be a useful step, given that at a particular point in time, some patients who have been diagnosed with diabetes will not have prescriptions for diabetes-specific medications.

Process Improvements—By the end of the PIP project, agreement had been reached to establish a single IRB that would be recognized across agencies. DOC was also apprised of online credentialing processes to verify human subjects training, with benefits in terms of streamlining the RAC approval process. After flowcharting the approval process as a whole, additional modifications were made. A network application designed to collate data from multiple agency databases in a secure manner was successfully demonstrated as a proof of concept.

Anticipating Capability Constraints—A mock-up correctional research website was presented by an academic institution team member as an alternative to conveying the same information either by phone or at multiple URLs scattered across the existing DOC website. During early discussions, team members proposed that DOC begin charging grant-supported researchers a percentage of their grant award to cover facilities and administration costs. This is customary among many agencies which routinely partner with academic institutions on grant-funded projects. Had this idea been effectively championed and implemented, it would have addressed some of the barriers that were subsequently encountered with respect

to concerns about website cost and the cost of upgrading and maintaining MIS infrastructure. These recommendations did not garner strong support from agency partners. A plausible explanation for this is limited dynamic capability, specifically as it bears on agency team-members' readiness to take risks and make investments based on assumptions about agency leadership and direction in the future.

Cross-Sector Partnerships—Going forward, developing dynamic capability may depend on leveraging the strengths of cross-sector partnerships. Briefly, these are “are multilateral collectives that engage in mutual problem solving, information sharing, and resource allocation (Koschmann, Kuhn, and Pfarrar, 2012, p. 362).” Over time, cross-sector partnerships develop *collective agency* to promote organizational change, and do so by means of marshalling organizational support for change and generating data – for example, in the form of authoritative texts -- to articulate the benefits of change.

Forecasting—In the management literature, “forecasting” refers to leaders' abilities to accurately predict the eventual impact of a new policy or initiative given what is known about an organization. Forecasters often use the current state of an organization as a basis for predicting the future, and exhibit difficulty accurately incorporating non-routine or sporadic events such as a change in leadership in their forecasts (Lawrence et al., 2006). To speak to this need, and drawing on our observations of the impact of the gubernatorial election, we have generated a model of agency-institution dynamics. The model (Figure 2) shows that vertical, horizontal, cross-level, and extramural coordination are distinct, time-varying, multi-level processes.

Implications for Systemic Action Research

Following disruptive events such as elections or agency reorganizations, collaborators may be lost to retirement or reassignment. This, in turn, may moot formal or informal agreements to collaborate toward a particular project-related aim. Iteratively generating predictions for the future and comparing predicted and observed interim outcomes is a key component for steering an agency-institution partnership.

Scenario-Planning—The election cycle effects impacting the PIP project were unexpected but not entirely unpredictable. This weighs in favor of incorporating *scenario-planning* in future projects of this kind. Seen as a tool to build organizational capability, scenario planning is designed to help “cope with uncertainty, i.e. multiple equally plausible futures” and “take account of multiple interpretations of what is going on, representing the different views of the stakeholders (van der Heijden, 2005, p. 60).”

Effective scenario-planning would rely on persons with agency and institutional experience to build detailed mental models representing agency, institution, and agency-institution relations at successive points in time, with variations on the mental model representing distinct probabilistic assumptions. Planning was integral to the PIP project, but our post-project deliberations have led us to speculate that a more formal process of scenario-planning might have led to (a) earlier adjustments to the project timeline to anticipate reduced availability of partners and informants during the run-up to, and aftermath of, the

election, (b) efforts to recruit additional champions in support of project aims as insurance against loss of champions to retirement or reassignment, and (c) more timely discussions of whether project-related aims required revision in light of emergent obstacles and opportunities.

Open Transcription—This approach was instrumental in achieving project aims and providing evaluation data. It was particularly valuable in terms of comparing transcripts from different points in time, to assess continuity and change in project priorities as expressed by agency partners. One lesson from our experience is that two or more transcriptionists may be necessary to capture a complete record of group discussions. Secondly, to enhance the utility of transcript data, group discussions might be structured in such a way to ensure that (1) every team-member participate and (2) teams discuss and review their recommendations. One approach for structuring discussions along these lines is *concept-mapping*. As developed by Trochim and Kane (2005), this involves several steps. The aim is to generate a plot or “map” representing areas of consensus and divergence (c.f., the Delphi method) among multiple stakeholders. Of particular relevance is the concept-mapping step at which every participant is asked to generate ideas; once the ideas are generated, participants are asked to sort them and rate them in terms of variables such as relative importance and feasibility. When meetings are carefully structured, transcript analysis becomes a more powerful a tool to chart within-person and within-team change over time, where relevant changes include indications of increasingly accurate predictions, increased sophistication of strategies for optimizing agency-institution coordination under a range of plausible scenarios and increased commitment to emergent project goals.

Discussion

The phenomenon of mass incarceration has exacerbated disparities in health care outcomes experienced by ethnic and racial minorities, socio-economically disadvantaged persons, and communities where formerly incarcerated persons reside. These disparities are driven largely by social and structural determinants, and that the traditional foci of public health interventions on changing individual behavior, disease-specific models, and time-limited projects are unequal to the task of inflecting lasting improvements in community health.

Partnerships to Inform Practice (PIP) has sought to increase integration between Connecticut educational institutions and the Connecticut Department of Correction (DOC), with the purpose of building infrastructure to support practice-based programmatic research, healthcare delivery process improvements, and learning. This, in turn, is envisioned as a means of attracting public health funding for initiatives to improve the health status of members of the correctional population.

Building on and existing multi-disciplinary literature, agency capability has been described in terms of organizational capability to achieve ongoing organizational aims in the present, dynamic capability to introduce changes in policy and practice with an eye to the future, and absorptive capability to learn from and collaborate with partners. Capability-limiting factors have been identified and discussed. These include, (a) *agency structure*, where departmentalization and the presence of redundant process controls can produce predictable

and unpredictable delays in achieving project-related aims, (b) *turbulence*, referring broadly to the suddenness, frequency and/or amplitude of unexpected changes -- such as changes in personnel, policy, or practice -- within the agency, (c) *rigidity*, as a hindrance to innovation, collaboration and responsiveness to emergent opportunities, and (d) *susceptibility to exogenous organizational shocks*, referring specifically to instances in which the electoral process or a crisis precipitates sweeping changes in leadership, organizational priorities, staff composition, level of resources, and/or departmental structure.

In this paper, it is suggested that agencies subject to election cycle-dependent shocks will exhibit a predictable loss of capability in the period leading up to and following an election; this information is relevant to scenario planning activities which require that assumptions be made about availability of personnel and organizational capability at future points in time. In addition, a schematic representation of areas impacted by temporal variation in capability has been offered. According to this model, predictable choke points will arise with respect to: (1) intra-institution coordination, for example, as a result of academic competition, (2) inter-agency and agency-institution coordination, as affected by incommensurability of organizational priorities and structure, (3) within-agency horizontal coordination, and (4) within-agency cross-level coordination. The latter are instantiations of the familiar “silo problems” that beset bureaucracies. This model contributes to the literature by placing emphasis on exogenous shocks (e.g., the election cycle) as contributors to temporal variation in level of coordination, over and above the effects of agency loss.

We conclude that even modest endeavors to develop a partnership with the aim of improving the health of the correctional population may fail if insufficient attention is given to the problems inherent in coordinating efforts within agencies and between agencies and academic institutions. Future efforts along these lines will benefit by carefully considering the dynamic aspects of collaboration and coordination and by making detailed, regularly updated projections regarding the project's rate of progress given a range of plausible future scenarios.

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Figure 1.
Organizational Turbulence in relation to discrete (“focal”) events.

Figure 2. Temporal Instability of Coordination Mechanisms. Levels marked “a” through “c” designate distinct strata in a hierarchical organization.

Table 1
Principles of Scientific Management

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1. *Division of Labor*: All jobs are “broken down into simple, routine, well-defined tasks.” This, in turn, fosters specialization,
 2. *Authority Hierarchy*: Each subordinate position is controlled and supervised by a higher position.
 3. *Formal Selection*: Employees are selected “on the basis of technical qualifications demonstrated by training, education, or formal examination,”
 4. *Formal Rules and Regulations*: Managers rely on organizational rules to ensure “uniformity of activity and continuity of function” during personnel changes,
 5. *Impersonality*: Rules and controls are applied uniformly,
 6. *Career Orientation*: Managers are regarded as professionals and can pursue advancement within the organization.
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Freeman (1999, p. 13).