JOBS AS GORDIAN KNOTS

A NEW PERSPECTIVE LINKING INDIVIDUALS, TASKS, ORGANIZATIONS AND INSTITUTIONS

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Abstract

Jobs fundamentally influence and are influenced by individuals, organizations, and societies. However, jobs themselves are largely conceptualized in an atomized and disembodied way. They are understood as being designed, altered, and dissolved and bringing their consequences one-at-a-time. I advance an alternative view of jobs as a system of ties that span jobs, organizations, and the environment beyond organizational boundaries. These ties create Gordian Knots that hold jobs in place and explain how they change. I illustrate the model with case study evidence and propose an agenda for research on jobs as organizational systems.

INTRODUCTION

Organizations exist as locations for the performance of work and that work is organized into bundles of tasks and titles known as jobs. Accordingly, jobs have been granted a central place in organizational research. An expansive body of research leaves little doubt that jobs are fundamental building blocks of opportunities, organizations, and societies and that these building blocks are themselves influenced by factors across many levels. Within this impressive body of research on jobs, however, scholarly conceptualizations of jobs as organizational systems lags far behind those of jobs as individual entities. This situation is analogous to the study of organizations never having progressed beyond the view of them as closed rational systems (Scott & Davis, 2007). Imagine how impoverished organizational theory would be without the concepts of institutions (DiMaggio & Powell, 1983, Meyer & Rowan, 1977), populations (Hannan & Freeman, 1977), networks (Burt, 1995), fields (Scott, 1994), and logics (Thornton et al., 2012). Job theory, to the extent it exists, is impoverished.

One troubling implication of not attending to the systemic nature of jobs is that researchers build from an inaccurate representation and come up with limited or inaccurate understandings. For example, studies of employee mobility and inequality typically depict people as moving through a stable set of pre-existing jobs, albeit at differing rates, depending on various individual and organizational characteristics. But in recognizing that people move through a set of changing jobs, and that job creation, alternation, and destruction differentially affects different kinds of people, my prior research (Cohen & Broschak, 2013, Haveman et al., 2009, Haveman & Cohen, 1994) provides more nuanced insight into patterns of mobility and inequality. Change in the set of jobs changes the set of opportunities and employees are not equally well positioned to take advantage of or find shelter from these changes. More pertinent to my current argument is that such research reveals a starkly different landscape of jobs than commonly considered: jobs are evolving rather than stable; they are a collectivity as opposed to many solitary units; and they are open to many outside influences.

Scholars have filled volumes with explanations of how, when, and why differing configurations of tasks within individual jobs influence productivity, satisfaction, commitment, intention to stay, motivation, both monetary and non-monetary rewards and countless other outcomes at both the individual and organizational level. Since its introduction over four decades ago, the task design model (Hackman & Oldham, 1975) has been the dominant paradigm for organizational scholars studying jobs. The perspective's central idea is that a job's tasks determine its level of variety, complexity, identity and experienced meaningfulness and thus the overall desirability of a job which in turn determine employee motivation, productivity and satisfaction (Hackman & Oldham, 1975). Over the years, scholars have built upon this fundamental insight to create an increasingly complex model of how individual jobs influence these and various other outcomes at the individual, team, and organizational level (Grant & Parker, 2009, Morgeson & Humphrey, 2006). While these expansions and many subsequent critiques of this work have pointed to the importance of considering various aspects of the context of jobs (e.g., Aldag et al., 1981, Roberts & Glick, 1981, Rousseau, 1978), the treatment of jobs in this tradition remains highly atomized, disembodied and decontextualized. By intent, researchers in the task design tradition focus on understanding the consequences of one job or a few closely linked jobs at a time (Grant & Parker, 2009, Hackman & Oldham, 1975, Morgeson & Humphrey, 2006). Further, this research continues to build from assumptions that tasks are known, that they are sorted to meet well understood goals, and that work arrangements are under the control of managers working in the interest of the organization despite evidence that they are frequently violated.

More recently, scholars have examined how jobs come to take the forms they do. While this work adds considerable dimension to our understanding of jobs, much of it also conceptualizes jobs in an atomized and disembodied way. These scholars typically look at the creation or alteration of one job or a few closely linked jobs at a time. They also tend to focus on the effects of factors from one level, most typically a level close to the job or jobs in question (Bell & Staw, 1988, Berg et al., 2010a, Berg et al., 2010b, Hornung et al., 2010, Wrzesniewski & Dutton, 2001).

There are a few notable exceptions to these patterns – researchers who do more to treat jobs as an organizational system – and these exceptions illustrate the potential power of considering jobs as multi-level organizational system. Ethnographers of work often come close to considering jobs as organizational systems. By spending long periods of time painstakingly observing and tracking workplace interactions, they are able to gain insights into the ways that occupational members navigate and negotiate their work arrangements within organizational systems. Assemblers, engineers, and technicians use drawings and machines as boundary objects to determine and mark who is responsible for what (Bechky, 2003a, 2003b). Nurses and patient care technicians enact the division of labor on the hospital floor according to their demographic similarities and differences (DiBenigno & Kellogg, 2014). Within jobs at the Transportation Security Administration tasks are not evenly distributed to the women and men responsible for checking passengers (Chan & Anteby, 2016). Workers on film sets, in SWAT teams, on software helplines, and in university science labs reshape their work in response to problems and surprises encountered in performing their jobs on a daily basis (Bechky, 2003a, 2003b, Cohen, 2013, Huising, 2014, Okhuysen & Bechky, 2009, Pentland, 1992). With their emphasis on day-to-day and job-to-job interactions, actions, and reactions, these studies represent an important step toward treating jobs as a product of and a producer at multiple levels in an organizational system. They clearly challenge the classic job design assumptions of known tasks and organizational goals and managerial determinism.

While such rich ethnographic studies shine a powerful spotlighting on observable day-to-day interactions, they provide less traction in explaining the effects of more distant and less frequently seen factors that are part of this organizational system of jobs. By design, this research is focused on interactions that can be seen in the somewhat patterned activities of the workplace. These methods are well suited to capturing the micro dynamics that unfold across a handful of hospitals, labs, or other organizations in response to specific exogenous shocks such as the introduction of a new technology, regulation, or social movement. They are less well suited to capturing the broader effects of such shocks across a system of organizations. But, researchers in other traditions have stepped in and partially filled this gap by looking at the patterns of influence related to factors outside of organizational boundaries. For instance, in response to the environmental movement many universities implemented recycling programs which led to the creation of a variety of new jobs; the specific form these jobs took depended on institutional allegiances (Lounsbury, 2001). In savings and loan institutions, the industry-level dynamics of firm foundings and mergers, growth, and contraction led to the creation of new jobs and the destruction of existing ones (Haveman & Cohen, 1994) and the effects of these dynamics varied depending on where individuals and organizations were located in the social structure (Haveman et al., 2009).

In parallel, a handful of scholars have looked beyond the creation or alternation of *individual* jobs to examine vital processes in *populations* of jobs – births, changes, and deaths (Beckman & Burton, 2008, Cohen & Broschak, 2013, Ferguson et al., 2016, Hasan et al., 2015). For instance, the effects of the advent of recycling programs, the installation of a DNA sequencer, or regulatory interventions touch multiple jobs and do not always produce consistent outcomes within or across organizations (Cohen, 2013, Huising, 2014, 2015, Lounsbury, 2001). External interventions simultaneously affect multiple jobs because they lead to the creation of new tasks that can be bundled into and across multiple pre-existing or new jobs. Further, changes to a single job may set off a cascade of change in other jobs within an organizational system (Haveman & Cohen, 1994) in much the same way that a vacancy in one job in an organization can set off a chain of vacancies in an organization (White, 1970). Clearly the design of a system of jobs cannot be understood as the aggregation of the design of the individual jobs in that structure. Single jobs are not changing in response to single triggering factors: instead, a system of jobs responds to a system of inputs.

Long ago Adam Smith (1937 [1776]) demonstrated that that the full effects of a set of jobs is not simply the aggregated effects of isolated jobs, but instead that jobs realize their full effects in concert with other jobs in the system. The canonical example comes from the pin-making factory visited by Adam Smith: dividing the tasks involved in making and packaging pins into 18 distinct steps made it possible for 10 men to produce 48,000 pins per day, rather than the 20 or so per day that an individual worker, doing all these tasks together,

could manage. More recently, scholars have shown that the set of jobs at place at one point in time influences diverse outcomes including whether new jobs are added, whether people are hired and remain in the organization, and whether firms are able to make an initial public offering (Baron et al., 1999, Beckman & Burton, 2008).

When viewed together, this varied research reveals an interesting story of jobs as organizational systems, but there has been little effort to integrate across the diverse bodies of work that touch on this more systemic view of jobs in organizations. The pockets of research on organizational systems of jobs exist mostly in isolation of each other and far from the well-developed body of research on individual jobs. In this paper, I integrate these disparate pockets of research to create a model of jobs as an intertwined organizational system. At the base of the model are the structures of individual jobs. These individual jobs combine to form the organizational job structure – the collective set of individual jobs in an organization bundled into levels, departments, and hierarchies. Finally, these individual and collective jobs exist within the environment of the job beyond the organization. Throughout this system there is a series of social, technical, and structural relationships or ties within and across the three levels. Like any network tie, these job ties influence the decisions and actions of job incumbents, managers and others within and beyond the borders of the organizations. They reflect various characteristics of jobs: their relative status and standing in relation to other jobs within the organization. These ties are conduits through which resources and, especially, information flow back and forth between a job and other jobs, people, structures, organizations and the world. At the same time, ties can act as Gordian Knots[1], holding jobs firmly in place. Ties bind tasks and titles; they lash jobs together and fasten them to particular places in the organizational structure; and finally ties connect the job to structures and people beyond the organization. Ties, or the lack thereof, can also explain patterns and timing of job change. Ties can be severed to unleash change as happened in the legend when Alexander the Great cut through the Gordian Knot that held the ox cart so firmly in place for so many years and became emperor of Asia.

Looking at jobs in a multilevel way and attending to the ties within, between, and across jobs and organizations can help us to predict job behavior: for instance, when, where and why jobs appear and disappear within this system; why and how jobs change as a system, how events beyond the organizational borders interact with factors internal to the organization and job to shape jobs individually or collectively, or how this broader system affect the opportunities of people within an organization. In addition to theories of work itself, this model contributes to theories of job mobility and stratification by attending to the structure in which these take place. It also contributes to network theories by developing ideas about jobs as networks in themselves.

Patterns of job behavior clearly matter. Changes to these job systems—the tasks, titles, and locations of jobs—equate to changes in the structures of organizations and the opportunities contained within them and has important individual, organizational, and societal consequences. Alterations to jobs are also alterations to opportunities – rungs on the job ladder that are no longer in place as such – and sources of added uncertainty about the structure of opportunity. The alteration of any job also alters the overall distribution of jobs and this has implications for the relative distribution of power, status, and other rewards associated with even the jobs that remain untouched. For instance, the vital processes of organizations create and destroy opportunities and in doing so push and pull individuals through these structures; further, men and women are differently positioned to take advantage of any opportunities that appear (Haveman et al., 2009, Haveman & Cohen, 1994).

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[1] A Gordian Knot is an intricate knot with hidden ends and has come to represent a problem that can only be solved through bold action. According to legend, the original Gordian Knot was one used by the ancient founder of the city Gordium to lash his chariot to a pole on entering the city and was prophesized to be unfastened only by the future conqueror of Asia. The knot held over the years until Alexander the Great marched into the city and used his sword to cut through it (http://www.britannica.com/topic/Gordian-knot accessed 15 December, 2015).

For organizations, changes to these job systems also matter. Changes to these job systems are changes in the very structure of the organization. Differing arrangements of jobs have differing consequences for what work is done, and by whom. These arrangements affect how work is coordinated, who interacts with whom, and ultimately whether the work is done effectively and efficiently. Most basically, certain divisions of labor between workers dramatically improve both individual and organizational productivity (Appelbaum, 2000, Smith, 1937 [1776], Taylor, 1967 [1931]). Symbolically, the array of jobs that exists in this organizational system signal to both internal and external audiences what that organization intends to do, what it values, what competencies it requires in workers, and ultimately what it is – its identity (Baron, 2004, Beckman & Burton, 2008, Beckman & Burton, 2011, Fligstein, 1987). Organizations' job structures constitute an "organizational language"(Meyer & Rowan, 1977: 349); "speaking" this language signals organizations' conformity with prevailing norms – or their deviation from those norms.

In the remainder of the paper, I develop this model in steps. First, I expand on the formal definition of jobs by discussing the elements within the job, the organization, and the environment that come to be bundled with them. Second, I introduce the notion of job ties – the social, technical, and structural relationships that bind these diverse elements across levels to a job – and discuss the implications of these ties for job stability and change. I end by presenting a research agenda for the study of the system of jobs. Throughout the paper, I illustrate many of the points with observations from two settings. The first is from academic settings observed over my career. The second relies on interview and observational data gathered for a case study of one specific system of jobs (Cohen, 1997, 2013). These jobs are in a unit of Biotech, a company that was launching a new DNA sequencing service for use in diagnosing a predilection for cancer. The unit arose, in part, out of vast advances in knowledge about and in technology used in the human genome project. The sequencing work in this unit was divided across five groups of dedicated specialists, each of which repeated a routine set of sequencing tasks each day. In addition, there were positions for people who researched and purchased equipment, for a line supervisor, and a lab director. I focus on one of those technician jobs, the gel pourer position, in the context of the broader organizational job system surrounding it.

JOBS AS BUNDLES

Definitions of jobs typically focus on them as bodies of work assembled under bureaucratic headings: a stable amalgamation of tasks assembled together and performed under an administrative job title (Abbott, 1993, Cohen, 2013, Miner, 1987). Such definitions have the benefit of being based on concrete and observable elements – work, tasks, and titles – that in themselves have substantive effects. Tinkering with just the tasks and titles in jobs can alter attitudes, behaviors, identity, and productivity (Grant et al., 2013, Hackman & Oldham, 1975). Consider for instance, the job of the gel pourer at Biotech. This job contained a defined set of tasks – making a gel solution, removing old gel from glass plates, cleaning the glass plates, drying the plates, setting the plates up, pouring the gel, inserting a spacer, etc. That distinct set of tasks was also bundled with a job title, gel pourer, and a location near the bottom of the organizational hierarchy. These tasks, this title, and this location undoubtedly shaped how incumbents responded to and performed in the job and to some degree the performance of the organization. For instance, because the tasks were few and repetitive, incumbents quickly became bored, dissatisfied, and potentially inattentive which has obvious performance implications.

While this is informative, it leaves critical information out of the analysis. The definition of jobs as assemblies of tasks, titles, and locations neglects much else that is bundled with the tasks and titles of jobs and that makes them interesting, especially when attempting to consider them as a system (Cohen, 2013). The tasks, title, and location of the gel pourer job, or of any job, are in turn bundled with elements contained within the boundaries of the job, within the boundaries of the organization, and beyond both these sets of boundaries. While these elements may not be part and parcel of the job, they do much to explain what happens in and around these jobs and provide the basis for understanding the overall organizational system of jobs. Below, I discuss the many elements bundled fully or in part with those tasks and titles.

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Within Job Components

The most readily apparent element bundled into a job is the job incumbent. In the case of the gel pourer, the incumbents were a group of four women though for other jobs the number will vary from one to a much larger number. Job incumbents inhabit and animate their jobs and come the closest of any actor to being human embodiments of them. They are the only actors dedicated to specific jobs and their fates and so their interests are directly linked to their jobs. For the gel pourers, discussions of eliminating this gel pourer job were also discussions about eliminating the people who poured those gels or potentially redeploying them to other positions. More generally, if a job expands or contracts through the addition or removal of tasks, the work of the incumbent expands or contacts. If a new title is created for a position, the person in that position also gets a new title and all that comes with it. If a job disappears or is moved, its job incumbent may also disappear or move. Just as jobs influence the fates of their incumbents, incumbents themselves can and do act to move tasks into and out of their own jobs and push to have their jobs re-titled or moved and so influence the fate of the jobs.

In addition to the incumbents, tasks and titles, many other inanimate elements are bundled within job boundaries. The tasks contained in any job suggests a set of competencies that incumbents should hold. For instance, the tasks of tenure-line professors typically include those related to research, teaching, and service and these professors should have competencies under these same headings. Being able to articulate these knowledge, skills, and experience, however, does not assure that these will be held by the job incumbent or that the job incumbents won't possess others beyond these to varying degrees: e.g., some professors have remarkable teaching competencies which others lack; some have distinctive consulting skills developed in past work that go beyond those required in the job. Thus there is set of competencies associated with a job that combines some required to do the job and some that are not. In the case of the gel pouring job, the skills required were quite basic though required much precision. The incumbents all had these basic skills though they also had skills that went beyond these.

Monetary and non-monetary rewards for those who perform them are bundled into jobs. Employees are financially compensated to do their jobs. Opportunities for training and career mobility are attached to jobs. Employees' levels of psychic job satisfaction, motivation, and performance vary depending on the tasks within jobs: e.g., incumbents in those jobs with more task variety and complexity of tasks, significance, autonomy, and feedback will be more satisfied and motivated and perform at higher levels (Grant, 2007, Hackman & Oldham, 1975, Morgeson & Humphrey, 2006). The tasks and title of gel pourers were also bundled with a relatively low salary, a standard set of benefits, and a truncated career path within the organization. They could not go to higher level jobs within the unit without skills that were not specified for that job and no job ladders were specified beyond the unit.

Organizational Job Components

These elements within job are in turn bundled with additional actors and elements within the broader boundaries of the organization. For any given job, a set of managers, both those directly responsible for it and those at a greater distance, have active interests in that job. Assessment of their performance may be linked with the performance in those jobs under their direct control. Jobs are also resources in organizations and as such managers derive benefits from the jobs under their control. Those who control more jobs, especially those jobs deemed to be more important, will be seen as more valuable to the organization and will be more powerful. Other organizational actors outside of these direct managerial roles have interests in various jobs. To the degree that organizational actors provide inputs to jobs, rely on the outputs of those jobs, interact with the incumbents of them, or manage people who manage these other jobs, they will have an active interest in even jobs they do not hold. The individual bundles of tasks and titles are organized with other individual jobs into functions, departments, and hierarchies in any given organization to form what I call an organizational job structure which is a critical component of the organizational job system. Further, various administrative and technical systems within the organization are bundled with jobs though extend well beyond any given job: job ladders and their

associated training systems, managerial hierarchies, human resources systems, organizational rules, technologies and their artifacts.

Consider again, the gel pouring job. It was bundled with a supervisor who had direct responsibility for managing it and the people in it, as well as with other managers and a director who were responsible for the performance of this job, the unit more broadly, and for some unit outside of this one and the overall organization. A set of co-workers, especially those in the gel loading jobs had direct interest in the gel pouring job because they relied on the gels that they produced to do their own work. The gel pourers in turn relied on the gel loaders and analysts to get their work done so that they could begin their routine of cleaning the plates in the morning. It was bundled with Biotech's administrative systems, including a job ladder that did not necessarily extend far beyond this job and a pay system that awarded this job relatively low wages.

Extra-Organizational Job Components

Finally, actors and elements from beyond the organization are also bundled with the tasks and titles of jobs. Some of these elements come to be bundled with a job because they are located within other organizations engaged in similar activities, others because they are in organizations that compete in product and labor markets, and others because they are linked through occupations and professions, technologies, legal and regulatory structures, institutional programs and even social movements. While there are many such outside elements that are bundled into jobs, I focus on three of the most prevalent forms: professions and occupations, regulatory structures, and unions.

Professions and occupations govern much of the world of work and organizations (Abbott, 1988, Anteby et al., 2016, Barley & Bechky, 1994, Scott, 2008). The processes of creating and altering occupations and professions are well documented: they are established through processes of licensure, certifications, professional associations, closure, self-monitoring; they battle over jurisdictions (Abbott, 1988), they construct occupational mandates (Nelsen & Barley, 1997), and more (Anteby et al., 2016). Less is understood about the connections between occupational groups and jobs within organizational structures. Yet, occupational groups exist in part as extra-organizational structures that provide supports for the tasks, positions, and individuals who perform them. Because they were technician jobs, the gel pourer jobs were thus bundled with the occupational community for technicians more generally and this shaped much of how the job was done.

Jobs are often bundled with regulatory regimes. For instance, certain jobs come to be associated with accomplishing regulatory compliance. Work related to achieving compliance with EEO mandates has come to be handled in a certain set of jobs in HR departments (Dobbin, 2009). Similarly, a consent decree from the EPA mandated the creation of specific jobs in a university system (Huising, 2014). Further, jobs may be directly attached to regulatory frameworks surrounding employment. For instance, in the US, the Fair Labor Standards Act and other employment standards offer specific protections to specific types of jobs: exempt (managerial) versus non-exempt (non-managerial) versus professional versus technical (Banks & Cohen, 2005). The gel pourer job at Biotech was bundled with several regulatory bodies beyond those governing all employment within the United States and within the state Biotech was located in. Among these were various insurance regulators who became involved because Biotech relied on insurance remittance to pay for its services.

Unions are another extra-organizational structure that bundled with many jobs. This bundling is evident for jobs that are directly covered by a collective agreement. However, it is not limited to this set of jobs. Union protections often extend to non-union jobs in organizations where unions are present, especially those that potentially could be unionized, as well as to jobs in non-union shops that could potentially be unionized. While jobs within Biotech were not unionized, similar jobs were unionized in other environments such as hospitals and universities. Because Biotech competed with these other organizations for employees, the arrangements in these other unionized organizations likely influenced jobs within Biotech.

Finally, jobs are often bundled with technologies that develop and come from outside of organizational boundaries. Such technologies will include physical artifacts as well as ideas about how work might be organized in conjunction with those artifacts. These can arrive on an ongoing basis through various services and documentation. At Biotech, a particular model of DNA sequencer was bundled with the gel pourer job. Through the artifact of the sequencer itself, and through the accompanying documentation and services, this technology provided many tasks and ideas about their arrangements to Biotech.

THE TIES THAT BIND

Jobs then are much more than the formal bundles of tasks and titles outlined in job descriptions. This is clearly evident when examining the gel pourer job. This job cannot be understood only as the set of tasks – cleaning plates, mixing gels, pouring gels, etc. – that fall under the title gel pourer. Jobs are bundles of elements at multiple levels: within the job, within the organization, and within the broader environment of the organization. The tasks and titles of the gel pourer job are bundled with the job incumbents and their individual knowledge, skills, abilities, and preferences, other jobs within the organization, regulations and regulators in the industry, and many other elements across these levels. This description of jobs however glosses over the mechanisms that brings these components together and holds them in these bundles. Network research provides a helpful construct – ties – for explaining how this happens.

Each element in these bundles has corresponding ties within and between levels: within the job, between the job and the organization, and between the job and the world beyond organizational boundaries. These ties serve as conduits for information and other resources and these resources shape behavior within and surrounding jobs and ultimately the fate of the jobs themselves. These ties also provide a view onto various characteristics of the job that can be used to answer questions about the relative status and standing of the job. While this latter may seem to be a passive function, what is viewed through these prisms shapes decisions and actions of all surrounding those jobs in ways parallel to the resources delivered through the conduits of these ties. They are both pipes and prisms and as such shape behavior.

One of the most important function of this the system of ties around a job acts is to serve as a Gordian Knot holding the job more or less tightly in place by virtue of the resources and bureaucratic structures that are attached to these ties. The Gordian Knots of jobs with more and stronger ties across these levels will be more difficult to unravel. Eliminating or changing jobs that are linked more strongly and to more numerous bureaucratic structures will create greater cascades of other potentially costly and otherwise problematic change. Further, the information that flows to a job through these ties can be used to fortify a job's position. Finally, jobs that are more closely linked to other high status elements will themselves be seen as higher status and be more protected, especially from unwanted interference.

Examining these ties can also help to explain when jobs will be altered. Changes in any of these ties will provide an occasion for restructuring or removing the jobs at one end of them. If the element on one end of the tie vanishes or if the tie itself is weakened or cut, the job is more susceptible to change. Finally, because these ties are conduits for information, the system of ties can also help to explain the nature of the changes that do occur. Ties allow exchange of information about how things are done in other jobs and organizations.

Below, I discuss ties across the three levels, focussing on some of the elements that are at the ends of each tie and the potential effects of these ties and presenting related empirical evidence. I then discuss how some dissolved ties can leave ghosts that continue to influence behavior in their wake.

Within Job Ties

Given the number of elements within the job, there is a large and diverse set of ties within it. Tasks within any given job are linked to other tasks in the job through many mechanisms. These ties may be relatively weak, simply the product of their traditionally being within the same job with no stronger logic holding them together.

The tasks within a job may appear inseparable but in fact could be distributed across jobs in many alternative ways. Consider the pin-making tasks discussed by Adam Smith (1937 [1776]) that traditionally were bundled in the same job and appeared to belong together. On closer examination this was not a necessary or strong link. The tasks could be distributed across many jobs to much greater effect. However, in other cases tasks may have much stronger links to the other tasks within a job and may be genuinely inseparable. This may be the product of technological requirements where one task requires the performance of another or must be performed in close sequence on a common piece of equipment.

Tasks also may be linked through the job incumbent: they go together in a job because the person in the job can do all of them. Such ties are the foundation of the link between the incumbent and the job. This incumbent-job tie is one of the most prominent ties and has been the subject of past research. The existence and effects of these ties between incumbents and jobs has been established empirically in literatures on person-job fit (Kristof-Brown et al., 2002) and turnover (Mitchell & Lee, 2001). The focus in this past research however has been on how such ties affect job incumbents: e.g., are employees who are more embedded in their jobs less likely to leave (Mitchell & Lee, 2001). These ties also have implications in the other direction: ties between jobs and their incumbents will affect what happens in and to those jobs, as well as to their occupants.

A tie of some nature always exists between the incumbent and the job. The more interesting questions about these particular ties concern their strength and effects. Much as the strength of interpersonal ties more generally are the product of multiple factors (Granovetter, 1973), the strength of the incumbent-job tie will be the product of multiple inter-related factors: the fit between the skills required in the job and the skills held by the incumbent, the incumbent's levels of satisfaction and commitment, the incumbent's level of performance in the job, the incumbent's tenure in the job, the number of incumbents in the job at any time, how well the incumbent understood the job at the start, and how long the job has existed and how stable it has been. Some of these properties can be seen in the gel pourer job. There is no direct measure of the strength of tie between the incumbents of the gel pourer job and the job. There is some evidence on the fit between the two. The people hired have demonstrated that they have the required skills to do the job and are able to perform as expected. The potential misfit lies in the opposite direction: the incumbents have skills that are not being used and expectations that are not being met by the job. The job and the people will likely both have relatively short tenures. Together this suggests that on the continuum from weak to strong, the incumbent-job tie is somewhat weak. This would have implications for the job itself.

A strong incumbent-job tie can hold a job in its place within the system, keep it from changing or from disappearing altogether. Job incumbents are not always passive recipients of changes in their jobs. They can resist change and incumbents with strong ties to their jobs will be more effective in their resistance by virtue of the very factors that make the tie strong: e.g., fit and performance. Incumbents can also actively advocate for change and here the relative effects of weak versus strong ties are less clear. Those with weak ties to their jobs may be more likely to actively seek change to the degree that strong ties are indicative of low levels of job satisfaction and mismatch. They also risk less when they seek change. Evidence is consistent with this proposition. People with unused skills actively seek out idiosyncratic jobs: e.g., an overqualified administrator took on additional tasks (Miner, 1987, 1991, Miner & Estler, 1985). Job incumbents may deliberately act to *craft* jobs when they are not well matched to their jobs; that is move their job boundaries – task, relational, and cognitive – so that the content of the job somehow better conforms with their preferences and callings, and desired meanings and identities (Berg et al., 2010b, Wrzesniewski & Dutton, 2001). Incumbents do *stretch work* – take on additional tasks to gain skills so that they can improve their prospects of getting a different type of position (O'Mahony & Bechky, 2006) which suggests that the job is a bad fit with their expectations. Success in these efforts, however, often requires resources and those with strong ties to their jobs may have greater access to resources by virtue of better fit and stronger performance.

The relatively weak link between the incumbents and the gel pouring job can help explain one change that was made to the job. People in that job and those in other very similar jobs within the unit became bored with their

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work and frustrated with their inability to step in to help others with their work. In response to concerns about this, the jobs were altered to allow incumbents across these positions to and give and get help as needed, providing an increase in task variety across the jobs. This seems to be a product of relatively weak ties between incumbents and jobs. While incumbents had the required skills, they had a desire to use and potentially develop additional skills. This misfit meant that the ties between incumbents and jobs were weak and this allowed change in the jobs.

The ties between incumbents and jobs are also relevant when considering what changes do occur to jobs. Job incumbents provide links to the levels described below and those links often facilitates change in jobs, as well as influencing initial arrangements. Evidence suggests that incumbents carry ideas about task arrangements with them and put these into action in a variety of ways: incumbents themselves become sources of both the tasks that become part of a job and the ideas for how they might be bundled together; they carry ideas about task arrangements with them from previous jobs, from their education, or from other sources beyond the organization; and they develop arrangements as they respond to the various problems presented in the workplace (Cohen, 2013). For instance, at Biotech, the first technicians who filled the gel pouring jobs brought in ideas about how things should be arranged and made minor adjustments along the way. Another early gel pourer, came from another lab at Biotech and had a role in setting the work up to reflect what was done in that other lab.

Job-Organization Ties

The individual jobs, the overall organization job structure, and the various actors and other organizational structures are held together, in turn, by a set of ties to a complex of elements in the organization. Like ties within jobs, these will vary in their origins and their strength. Some of these ties are clearly dictated by the formal organizational structure while others are more interpersonal or social in nature, based on relationships rather than structural requirements. The job incumbent is at one end of many of these ties to the organization. These ties may have their origins in formal structural relationships and interactions: incumbents come in contact with and develops relationships with many people in the normal course of doing their jobs. These are the ties that can be easily seen in organizational charts and work flow diagrams: the organizational chart for most universities shows that each professor job has a reporting relationship to a dean's job; examination of the work flow in a university shows that the professor is also linked to students, other faculty members, and various administrators. Other ties will result from personal relationships that may develop independently of performing one's job: job incumbents choose to interact with various individuals with whom they do not have formal work interactions. The personal relationships sometimes overlap with and are facilitated by the more formal structural ones: a professor does work with a colleague in another department or area and also becomes an informal mentor or friend to that colleague.

Jobs are also tied to the organization by being tied to managers, both those who are directly and those who are indirectly linked to the job. These managers will have various other links throughout the organization. Like the ties of the incumbent, these may be based on structural requirements, on interpersonal relationships, or a combination of these factors. The strength of these ties will vary with some being determined by strong technical and administrative forces and others by less obvious circumstances.

Not all ties linking jobs to organizations are between two individuals. The structural elements bundled within jobs may be tied to individuals or to still other structures in the organization. These ties between jobs and the organization are products of technical and administrative systems and structures. Ties may be a matter of simultaneous or sequential interdependence. When the tasks of one job cannot be completed without tasks in another job being completed, those jobs are tied together. Some job-organization ties will be related to technology. For instance, performing a job may require the use of various organizational technologies and this would create ties with the technology itself, with other jobs where the technology is used, and with those who use and manage that technology. A job may be tied into administrative structures such as job ladders, complex

compensation plans, performance systems, and other formal HR and organizational systems and this would create another series of ties between a job and the organization.   Importantly, jobs are linked to varying numbers of other jobs and with varying strength. The stronger ties will be between jobs where there is some sort of overlap or technical interdependence.

Examining the links between the gel pouring jobs to other jobs even within the single unit at Biotech is revealing. The gel pourer is linked with the jobs of robot operators, gel loaders, analysts, various managerial positons, the director position to form this unit and these jobs were in turn linked with still other jobs to form the organization. Each of the technician jobs in the unit had a very narrow job descriptions each focussed on a single set of tasks: the gel pourer who performed tasks around pouring the gel needed for operation; a gel loader who loaded the gel, etc. These jobs were linked by their interdependence. In particular, the gel loaders relied on the output of the gel pourers to do these jobs. This dependence creates a strong tie. The ties to other jobs and gel pourer were less direct and so weaker. These jobs were also arrayed across levels: from director down to the gel pourer job, which was the least skilled and so lowest level of technician. They were also arrayed across functions: e.g., robot operators could work in pre-blood or post-blood functions. This small bit of easily observable information provides insight into the general management philosophy, what the company is trying to accomplish and how they intend to do so. It also is evident that these jobs were designed as a system not as isolated jobs. A set of tasks – many but not all of which were dictated by the sequencer and appeared to be tied together by that technology – were sorted across a set of jobs at different levels and in different functions to create this structure. The job structures also provide employees with schematics of how monetary and psychic rewards are allocated; because employees often use social comparison to assess their well-being, and because relative location within job structures is usually obvious, employees use their relative locations within their employers' job structures to evaluate how well they are treated (Baron & Pfeffer, 1994). In the case of the gel pourers, they could understand much about their own job by comparing it to others in the system.

Ties between a job and the organization can serve to hold that job in place within the system in several ways. The ties are indications of having more bureaucracy built around the job which would mean that any change to that job might produce an unwanted cascade of change in connected jobs and other elements of the organization. Further, managers who are tied to jobs may act to protect those under their control from change. Because change is more costly for them, jobs with more and stronger ties in the organization will be less likely to be undertaken than for jobs with fewer and weaker ties. In a study of the degree of routinization of jobs in a large decentralized organization, Rura-Polley and Miner (2001) provide evidence consistent with this view of ties as a source of inertia: jobs become more routinized—seen as the way of doing things—when they contribute more to a department and are novel. Both of these factors are indications that jobs having stronger ties to the organization: jobs that contribute more are more central; jobs that are novel are more adaptive to organizational needs.

Within organizations, a number of events and actions sever job ties and set off cascades of change. Programs undertaken at the organizational level change ties: e.g., organizational change programs; deliberate contraction and growth, the introduction of new technologies, products and strategies; mergers and acquisitions, the centralization or decentralization of services. All of these can sever the ties of a job to the organization. For instance, the adoption of such formally defined change programs as Total Quality Management (TQM), Business Process Reengineering (BPR), and Six Sigma turbulence break ties and even go so far as to suggest what new ones might be put in place (e.g., Huising, 2008, Zbaracki, 1998). Nor is change always the product of deliberate and intended organizational programs. Unanticipated growth and contraction often alter patterns of work and relationships as employees move between positions and as the set of positions is altered. Managers will jockey for resources, including control over the most important jobs themselves, to increase their own power and the dependence of others on them, and to manage conflicts (Jackall, 1988, March, 1962, Morrill, 1995).

Though not using the language of ties, scholars have proposed related ideas about how disruption leads to change in jobs. For instance, in his demographic model of change in job populations, Stewman (1988) proposes a set of disrupting events: job cutbacks or deaths, technological change, growth and evolutionary processes. Miner (1990, 1991) suggests that jobs may be terminated in the face of lost funding, incumbent departure, planned reorganization, and unexpected shocks and finds support for these predictions. The absence of an incumbent, a manager or structures is a special case of non-existent or weak ties and will be associated with increased likelihood of change. For instance, the departure of an employee and the hiring of a replacement are sometimes seen as occasions for restructuring of that job (Cohen, 2013, Levesque, 2005, Miner, 1987, Rousseau, 2005) and may actually start a cascade of changes in other related jobs. These and other studies demonstrate that shocks can precipitate change, in part, because they change the social order. In other words, they alter relationships and break ties. The severing of these ties provides an explanation for such changes that can be applied across these many cases and levels.

Ties between a job and other elements in the organization can influence the shape of change. First, the managers who have ties with jobs carry substantial information with them based on their previous experiences and their education. They are themselves sources of information. Further, it is sometimes through the managerial ties that information from other places in the organization and from outside of the organization is carried to a job. The influences of organizational ties through the manager on the shape of jobs were evident at Biosupply. The man hired as the director of the lab had experience in in an agricultural biology where it was common to replicate factory arrangements of work. This influence of this experience was evident in the initial assembly-line like arrangements initially put in place at the lab. He was also the one who made the decision to purchase this particular model of sequencer which produce the particular set of tasks that were divided across jobs. Other managers, more closely connected to the jobs at Biotech, had similar influences on the shape of jobs.

Extra-Organizational Ties

Finally, jobs have a layer of ties that extend beyond organizational borders. The elements at this extra-organizational level have received by far the least amount of attention in jobs research. These ties are also the most varied and potentially most influential ties and potentially the ones over which individual managers and incumbents can exert the least direct control. There are several mechanisms through which ties between a job and extra-organizational structures can hold a job in place. Jobs with such extra-organizational ties are often part of a larger bureaucratic structure and change to them in such cases will unleash a complex cascade of other changes and will be associated with greater risks. These ties also introduce a larger set of actors with potential interests in the outcome of jobs who may be working at cross purposes with the net effect of maintaining the status quo. Indeed, professional associations, regulators and unions often oppose efforts to dissolve or even add tasks to or subtract tasks from jobs that fall under their umbrellas.

These outside ties may provide resources that make change difficult to enact. One of the resources these outsiders provide is the supply of people to do the job. Because they control the supply of workers, these outsiders can also exert control over the work that they do. For instance, professions gain power by controlling the supply of professionals, their training and socialization, and their processes of self-governance (Abbott, 1988, Larson & Larson, 1979, Weeden, 2002). Professionals also supply strong norms about how certain work should be organized. Often, there is an expectation and a legal requirement that certain types of work be done by a professional: for instance, only a lawyer can do certain legal work. Because of the power of professions, such norms and regulations are difficult to control from within an organization. More broadly, regulators often can impose sanctions for non-compliance with regulations. The threat of legal action can keep organizations from making desired changes. Similarly, jobs that are under the union umbrella will be less likely to be changed as unions control the supply of workers and are essentially conservative forces against any form of job change even to the extent unions will fight to maintain jobs in the face of disruptive forces such as technological change or outsourcing.

In effect, jobs with ties outside of the organization often become taken for granted: there is an expectation that jobs take certain forms and deviations from those forms may bring the risk of punishment. This translates to making these ties to between jobs and the world beyond the organization difficult to influence. Even if an incumbent or a manager wants to advocate for change in a job, ties between the job and these external structures may make these efforts less than effective.

At Biotech, gel pourer jobs had several ties that extended beyond the organization. I focus on two of these: ties to the technology and ties to insurance regulators. All of the technician jobs were tied to the technology of the DNA sequencer that was being used. While this equipment did not determine the final arrangements of work, it did dictate many of the tasks that had to be done in the unit and many of these tasks were bundled together in the Gel Pourer job: e.g., a mixture must be made, a gel must be poured onto a glass plate, the two plates must be put together.

This gel pouring job was also tied to medical insurance regulators, in particular those in New York State. Because the lab was involved in diagnostic work and would depend on insurance remittance, it was forced to adhere to diagnostic guidelines from various regulating bodies. Its tactic here was to adhere to the most stringent guidelines because these would cover the less stringent ones. Because the regulations in New York were the most stringent, these were the rules that were followed. To keep costs down, the company had adopted a strategy of hiring lower-skilled workers. However, this came in some conflict with the New York State insurance regulations which dictated minimum education and experience requirements based on job complexity. Because some of the technical tasks were defined as being more complex, the technicians performing them would have to have four-year degrees. However, some of the less complex tasks could be performed by technicians without those degrees. Many of these tasks were bundled together in the gel pourer job.

Disruption to these ties between jobs and the outside world, however, can unleash change. Numerous ethnographic studies provide nuanced understandings of the alterations that arise in the performance of tasks within particular jobs in response to various shocks: e.g., the introduction of new technologies (Barley, 1986, Cohen, 2013, Thomas, 1994), new regulatory programs (Huising & Silbey, 2011, Kellogg, 2010), social movements(Hallett, 2010, Kellogg, 2011), or seemingly more mundane yet unanticipated surprises and problems (Bechky & Okhuysen, 2011, Pentland, 1992). Each of these shocks can be interpreted as a disruption of existing ties between jobs and structures beyond the organization. Others have quantitatively charted the broader patterns of disruption to jobs associated with these and similar events. While many of these studies chart the creation and spread of certain jobs, these events are realized within organizations and are changes to organizational job structures. The creation and spread of human resource departments and standardized work practices has been linked to social unrest, union activity, World War II and government reporting requirements (e.g.,Baron et al., 1986, Baron et al., 1988, Jacoby, 1985). The 1968 student movement in France led to the rise of nouvelle cuisine which in turn altered the set of tasks done in restaurant kitchens (Rao et al., 2003). The Progressive movement led to changes in work within savings and loans (Haveman et al., 2007). The environmental movement led to the creation of university recycling programs which altered the work done in existing jobs (Lounsbury, 2001). Changes in financial reporting requirements set off the creation and spread of the chief financial officer role (Zorn, 2004). Positions within organizations appear and disappear following foundings, mergers, growth, and contraction within the savings and loan industry, pushing and pulling managers through the population of organizations (Haveman & Cohen, 1994).

The existence of these ties can also explain how organizations come to adopt the job changes that they do adopt. These ties carry information and shape what comparisons are made and thus influence the nature of changes made to jobs. Outside links, in the Biotech case to the technology and to New York State insurance regulators, account for a significant change that was being contemplated for the gel pourer job. Amid speculation that technological developments would eliminate the need for gels altogether, the director speculated that the gel pouring job would become obsolete and eventually be eliminated altogether. In

anticipation of this event, the unit started hiring technicians with higher skill levels for the gel pouring job so that they could be transferred over to other technician jobs and still be in compliance with New York State insurance standards for skill levels. Put into the language of job ties, technological developments threatened to break a tie. More broadly, there were frequent questions at Biotech about how technological developments would change operations and as a result change the configuration of work.

Ghosts of Ties Past

Few of these ties at any level are fixed overtime either for a job or for the individuals associated with it. New job ties may be created and old ones dissolved when new incumbents or managers come into jobs or organizations, when the set of tasks in a job is altered, when a technological or administrative process changes, and when the actors around it develop new relationships. Yet even as these ties evolve, the ties present at any one point in time may leave imprints or ghosts that persist and influence the job long after an incumbent has left, a task has been eliminated, or a technology reconfigured. For instance, a set of tasks may be assembled together in a job because a particular incumbent can or wants to do all of them and those arrangements may become a pattern going forward even for incumbents who don't have the same skills or preferences (Burton & Beckman, 2007, Miner, 1987). Similarly, when those managers depart from organizations or jobs move from a manager's reach, managers, like incumbents, may leave relationship imprints on jobs. Thus when considering the ties of a job, it may be necessary to look back to past ties. These imprints may be especially strong when former incumbents and managers remain in the organization or when technologies and regulations are relevant elsewhere in the organization or its surroundings.

Because the DNA diagnostics unit was so new at Biotech and because there had yet to be any significant turnover in personnel it was impossible to observe ghosts of any past ties. It is easy enough to speculate about the potential for the lasting effects of the ties made early on. The interpersonal links made between the first incumbents and others in the organization would likely persist independent of those individuals, especially as interdependence and physical proximity helped replicate them. Similarly, early managers would leave imprints on the gel pouring job were they to leave through the choices that they made in organizing the work and the relationships they formed throughout the entire organization. For instance, the lab's director was also the director of another lab and this linked the gel pouring job to a very similar job in the other unit. Those links would likely stay in place if that director were to leave.

Summary

Examining the gel pouring jobs in this diagnostics unit through this framework shows it in a very different light than that shed by past research. While the tasks, title and location of the job had important effects, the effects were not simply a product of these of tasks and their implied levels of complexity, significance, autonomy, and feedback. The effects were a product of the job itself and the many factors surrounding it, including the people in the job, the jobs surrounding it, multiple managers in the organization and their past experiences, regulatory bodies and others beyond outside of this organization. Nor is this job a simple product of managerial design. This job was designed in tandem with other jobs in the system and was subject to inputs from parties within the job and organization and beyond organizational boundaries. The incumbents to which this job was tied influenced its ultimate design as did insurance regulators in New York State, the designers of this DNA sequencer, technicians in other jobs within this organization, and many others. Without attending to these ties, understanding of the causes and effects of the gel pouring job would be incomplete.

EMPIRICAL CHALLENGES AND OPPORTUNITIES

The model described above represents a dramatic rethinking of jobs and to a degree of organizations. Determining whether this model is a reasonable approximation of the world of jobs requires an ambitious program of empirical work. To start, baseline information is needed to document this system and its

components. Beyond that baseline information, the model also suggests a series of testable predictions about the effects of ties, about job stability and job change, and about the effects of individuals in jobs.

The data needs that come with documenting this system and exploring this model are intensive. Tests of the predictions inherent in this model require whole organizations and potentially multiple organizations over extended time horizons. Further, there is little agreement about what would constitute appropriate data and acceptable measures of many of the constructs discussed here: what is an appropriate measure of a job; what are appropriate measures of job ties. Measuring job stability and change itself presents extreme challenges. How can change in a job be observed and measured? How much change at the micro-level of the task bundle and title does it take to constitute change? Below, I discuss some potential approaches to some of these challenges.

Measuring Jobs

Miner's (1987, 1991) work provides an exemplary empirical design to address many of the phenomena discussed here, in particular for the measure of jobs. She used a combination of job titles, job descriptions, and interviews to understand and measure job creation and death. While this is an exemplar, it may not always be feasible to gather this type of data, especially when looking at these events over an extended historical time frame or when seeking a more detailed and nuanced understanding of these phenomena.

One alternative is to rely solely on available archival data with information on job titles. Job titles provide a reasonable proxy for actual jobs and evidence suggests that differences in job titles represent real differences in jobs (Robbins, 2002). Consistent with this, there are substantial bodies of work using job titles within and across organizations to answer questions about employee movement (Broschak, 2004, Haveman & Cohen, 1994), the division of labor (Baron & Bielby, 1986, Beckman & Burton, 2008, Burton & Beckman, 2007, Strang & Baron, 1990), and hiring, compensation, performance evaluation and other HR practices (Castilla, 2008, Elvira, 2001, Fernandez-Mateo, 2009, Fernandez et al., 2000). The data sets compiled by many ecologists, institutional, and network theorists on jobs in advertising, wine, newspapers, magazines, and savings and loans provide the kind of data of interest here. This approach does not come without challenges and controversy. One problem with these data is that they lack rich information on potentially important variables. It is difficult to distinguish between the different types of change based on titles alone. It won't be possible to capture the more microscopic changes that occur without an accompanying change in titles. It may not be possible to trace the trajectory of a disrupted job. Further, industry-wide datasets typically lack information on individual-level variables such as salary, education, human and social capital, and other relationships. However, titles are an approximation and a reasonable starting point.

Another approach would be to use detailed qualitative field data to better understand the dynamics underlying the change process. This approach would provide much more detailed and direct observations of the process. Through these methods, information could be gathered on what brings organizations to consider change, how the decision is made about whether and which jobs should be changed, what the broader implications are, and on how ties play into this process. This is process research and lends itself to qualitative methods where the processes can be observed directly (Langley, 1999) without the danger of retrospective rationalization. One challenge in using these methods is that jobs themselves don't talk and don't act – they are not good informants – and so observations would be of the people surrounding them and of how their actions affect structures. Further, qualitative data would lack the broad perspective provided by industry-wide datasets and lends itself less to theory testing than theory development.

Measuring Ties

In gathering data on job ties, researchers will need to develop and refine measures of the types of ties discussed in this framework. An obvious place to begin would be with various existing and validated network measures around the existence and strength of ties which might be gathered through questionnaires and surveys (e.g.,

Marsden, 1990). These measures will not always be readily available. In such cases, there are numerous indirect measures that are indicative of the existence and strength of ties at each level.

This strength may be difficult to measure directly and objectively. For instance, for the incumbent-job tie, the most direct way to measure strength might be to ask incumbents how strong their ties are to their job. Such self-reports, however, suffer from many biases. A supplemental measure might be constructed by asking managers and peers about tie strength but this becomes cumbersome and is subject to other sources of bias. Alternatively, the strength could be inferred by looking at factors like the fit between the incumbent skills and the job requirements, intent to leave, productivity in the job or the degree to which the incumbent is seen as interchangeable with the job in the organization. The strength of incumbent-job ties can be measured by assessing the fit between an incumbent and job. This could be measured directly through self-reports or through profile matching (O'Reilly et al., 1991). It may also be assessed indirectly. Employees with longer tenure are likely to be better matches (Jovanovic, 1979). Stronger performance in a job suggests better skill fit. Employees who enter their jobs and organizations through personal referrals are likely to be better fit for the job and the organization (Fernandez et al., 2000). The degree to which an employee is valued in an organization provides further insight into ties between that employee and the organization. Measures of this include high salary, high incentive payouts, being in a job associated with upward movement, having access to powerful people, higher skill levels, and greater experience.

Many of the organization-job ties can be understood by examining organizational charts and other documents and artifacts showing organizational structure. These will provide information on who reports to whom, how many people report to a manager; how jobs arrayed, which jobs are in the core versus periphery. Further information on job ties can be assessed by examining the work flows in an organization: e.g., how are the various inputs converted to outputs. The strength of such ties can be captured with measures of job age and size such as number of incumbents and revenues associated with the job and the number of units in which this job is present within the organization. Many of the manager's ties in the organization can be assessed by looking at the manager's span of control, proposed career path, whether the unit being managed is in the core, manager's salary. The strength of such ties can be captured with measures of job age and size such as number of incumbents and revenues associated with the job and the number of units in which this job is present within the organization.

One way to assess the existence and strength of ties to the world beyond the organization may be to examine how common a particular job is at different levels: within the industry, within geographies, across industries. Beyond that, the existence of each of the various types of extra-organizational ties would require a distinct measure. For instance, association with a profession or occupation could be assessed by looking at whether the job is associated with professionalization processes – licensure, certifications, professional associations, closure, self-monitoring. Union ties can be assessed by looking at whether the specific job is part of a union in the organization, whether it is part of a union in other organizations, and whether other jobs in the organization are part of a union. Some ties to regulatory compliance regimes can be assessed by looking at whether the job has a compliance component indicated in the title: e.g., an EEO officer, a compliance officer for EPA.

DISCUSSION

I began this paper by noting that our understanding of individual jobs far outstrips that of broader organizational systems of jobs. Scholars of jobs have filled volumes with explanations of how, when, and why differing configurations of tasks within individual jobs influence productivity, satisfaction, commitment, intention to stay, motivation, both monetary and non-monetary rewards and countless other outcomes at both the individual and organizational level (e.g., Grant & Parker, 2009, Hackman & Oldham, 1975, Morgeson & Humphrey, 2006, Taylor, 1967 [1931], Williamson, 1975). Indeed so much has been published on the topic of task and job design (e.g., Hackman & Oldham, 1975) that scholars writing in the area now often feel compelled to argue that despite claims to the contrary not all of the questions about job design have been answered (e.g.,

Grant & Parker, 2009, Morgeson & Humphrey, 2006). Scholars have more recently turned from prescriptively explaining how tasks should be bundled into and taken out of jobs to explaining how this happens. Job incumbents might sculpt or otherwise craft their job to better fit their desired meanings and aspirations (Bell & Staw, 1988, Berg et al., 2010a, Berg et al., 2010b, Wrzesniewski & Dutton, 2001). Jobs may be shaped around the specific knowledge, skills, and abilities of actual and potential job incumbents (Ferguson et al., 2015, Levesque, 2005, Miner, 1987, Rousseau, 2005), day-to-day interactions among members of multiple occupations on the shop floor (Barley, 1986, Bechky, 2003a, 2003b, 2006, Huising, 2014, 2015, Kellogg, 2010, 2011), responses to problems encountered in performing a job (Bechky, 2003a, Bechky, 2003b, Cohen, 2013, Okhuysen & Bechky, 2009, Pentland, 1992), or even events outside of organizational boundaries (Haveman & Cohen, 1994, Lounsbury, 2001). It is clear that jobs matter in fundamental ways to individuals, organizations, and societies and that they are influenced by factors across levels. It is less clear how jobs function as a system.

This gap in our understanding is a problematic one as these broader structures have causes and consequences that differ from the simple sum of those of individual jobs. Further, these consequences are important for individuals, for organizations, and for society as a whole. These structures provide windows onto organizational action and influence individual opportunity, how work is done, and how rewards are distributed. Making changes to any single job within the system will likely have implications for other jobs and elements in the broader system. Even a small change may set off a reaction throughout the system. For instance, the removal of necessary tasks from one job often implies the addition of tasks to another job or even the creation of a new one. This can create a chain of changes to the job structure of the organization. The elimination of tasks from jobs and from the organization altogether may indicate change not only in how the organization accomplishes its work but also in what it is trying to do. The elimination of a job from this structure has implications in terms of the opportunity structure of the organization. It is a rung on the ladder that is no longer there.

In order to build a model of organizational job systems, I stepped back to consider that many actors and elements were bundled within the individual units of jobs and that each of these elements in turn was connected through interpersonal and structural relationships to actors and structural elements within the job and the organization and beyond the organization. Each job in turn was a node in a larger network of jobs. The pattern of ties provided information about any given job and about the organization as a whole. These ties were conduits for resources, in particular for information about how to do the job and about what the job should be. These ties also pattern action in organizations.

The strength and number of the connections of any given job revealed how likely it was that the job would change, when it might change, and what form that change might take. Jobs with more and stronger ties across these levels may be more strongly held in place. However, the various actors with connections to a given job could act to alter that job and when those actors had more and stronger ties – in part by virtue of ties to the job -- they may have more power to make these changes happen. Further, when ties are broken – for instance with mobility into and out of jobs, with new technologies and regulations, or with various restructuring events – change becomes more likely. Those jobs with the strongest networks would be the least likely to undergo such change, especially when it is undesirable change. A more general way to understand change in jobs is to understand it as the product of broken ties. This implies that the same factors -- ties to various people, technologies, administrative structures and other jobs -- that hold together this system can also help to explain change in it. Specifically, a job may be more likely to change when there is change in any of its ties or to any of the people or structures on the other end of the tie.

This model provides a common language that can be used to describe this social system, a language that was lacking. In addition, by looking at jobs and organizational job structures as a system of nodes and ties across levels provides, this model contributes to understanding of jobs, the entire system of jobs, and the many systems to which these nodes connect. The model presented here represents a step toward developing theory about jobs as a multi-level system. This model along with much of the work that underlies it helps move the conceptualization of jobs forward in a way that nicely parallels current conceptualizations of organizations. It

also suggests an ambitious new research program for scholars of work and organizations. Moving this research forward is critical to enriching our understanding of the behavior of jobs.

Acknowledgements

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