Entrepreneurial Logic and Creating the Future

DISSERTATION

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By

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Abstract

Recent work on entrepreneurial opportunities (Alvarez & Barney, 2007) has suggested a type of opportunity that arises endogenously from an entrepreneurial actor, as opposed to exogenously from the environment. The "creation process" used to form and exploit these opportunities is different from previous views of entrepreneurship. This paper puts forth a new construct, entrepreneurial logic, to define the capabilities necessary to enact this process successful. Consisting of trust, creativity, and teamwork, entrepreneurial logic will help the actor that possesses it successfully create its own future by being entrepreneurial even in the absence of opportunities in its environment.

Dedication

To Lizzie, Maggie, and the rest of our family that we have yet to meet

Ad maiorem Dei gloriam inque hominum salutem

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CHAPTER 1: ENTREPRENEURIAL LOGIC AND CREATING THE FUTURE

The study of opportunities is the particular domain of the field of entrepreneurship (Busenitz et al., 2003; Shane & Venkataraman, 2000). As such, the origins of opportunities and the processes by which they are formed and exploited have been the subject of numerous studies (e.g., Alvarez & Barney, 2007; Eckhardt & Shane, 2003; Short, Ketchen, Shook, & Ireland, 2010). Recent work has drawn a distinction between opportunities that arise from changes in the environment and are discovered by entrepreneurial actors who are alert to their presence (Eckhardt & Shane, 2003; Shane, 2003), and opportunities that are created by actors and may not exist prior to their action (Alvarez & Barney, 2007, 2010). This distinction carries implications for the way in which these opportunities are best exploited as well; as discovery opportunities are relatively well defined before the exploitation process begins, search processes are appropriate and analysis is possible ahead of time. By contrast, since creation opportunities are defined over time through the actions of the entrepreneur and take place in a context of uncertainty (Knight, 1921), detailed planning is difficult, and flexibility and creativity in the exploitation process is more important (Alvarez, Barney, & Anderson, 2012).

Alvarez and Barney (2007) take no position on whether or not there is an essential *ex ante* difference between the entrepreneur and non-entrepreneur in the creation view. Whether or not such a characteristic exists, the successful execution of the processes they describe by which creation opportunities are formed and exploited requires that the entrepreneurial actor, whether an individual or a firm, have (or develop) particular capabilities. Since the creation view argues that the opportunity is formed as the creation process proceeds, this process and its execution is particularly important to success. These “creation capabilities” have been described in general terms (Alvarez et al., 2012; Alvarez & Barney, 2007), but to date the literature has not identified them specifically. The discovery view, by contrast, has described its essential capabilities of entrepreneurship in detail. The first key capability in the discovery view is alertness, the capacity to perceive an exogenously created opportunity in the environment (Gaglio & Katz, 2001; Kirzner, 1997). Executing an opportunity once it is discovered will require additional capabilities, such as risk-taking, innovation, and proactiveness (Miller, 1983). While capabilities such as these have been shown to increase performance in the entrepreneurial discovery process, the features of the creation process render them less applicable there. Therefore, a new construct, capturing the capabilities applicable to entrepreneurial creation, is needed.

This study puts forward a new construct to fill that gap, entrepreneurial logic. Entrepreneurial logic specifies the capabilities that facilitate the formation and exploitation of creation opportunities. Trust, creativity, and teamwork, the dimensions of entrepreneurial logic, will enable an entrepreneurial actor that employs them to

systematically create opportunities by endogenously forming and exploiting market imperfections. Thus, the actor will be able to pursue new opportunities even in the absence of changes in its environment.

The paper proceeds as follows. First, it briefly describes creation processes that entrepreneurial logic is meant to facilitate. Second, it defines entrepreneurial logic and its dimensions, and offers suggestions for its measurement. Finally, some related issues, including measurement of entrepreneurial logic, its relationship to a related construct, entrepreneurial orientation (Lumpkin & Dess, 1996; Miller, 1983), and its potential for generating competitive advantage, are explored, along with the limitations of the study and avenues for further research.

FEATURES OF THE CREATION PROCESS

As noted, the capabilities underlying entrepreneurship in the creation view have not been specifically defined. However, the processes used to form and exploit creation opportunities (and their differences with the processes used to discover and exploit opportunities) have been described by Alvarez and her colleagues (Alvarez et al., 2012; Alvarez & Barney, 2007). Their discussion proceeds from the evolutionary realist epistemological framework they adopt (Azevedo, 1997; Campbell, 1960) and extends several frameworks from economics, strategy, sociology, and entrepreneurship theory. These include Campbell's variation-selection-retention model (1960), Mintzberg's work on emergent strategy (Mintzberg & Waters, 1985; Mintzberg, 1978), Sarasvathy's work on effectuation (2001, 2003), and Garud and colleagues' work on path creation (e.g., Garud & Karnøe, 2001, 2003; Garud, Kumaraswamy, & Karnøe, 2010), among others.

The essential features of the creation process include decision making under uncertainty, its emphasis on evolution, and the fact that it depends on co-enactment with others in the environment. This discussion will serve as the foundation for the later explication of the capabilities which underlie the creation process.

Decision making under uncertainty

The first aspect of the creation process discussed in this paper is that it requires decision making in a context of uncertainty (Knight, 1921), as opposed to risk. This means that the eventual outcome of a decision is unknown and that insufficient information exists to assign probabilities to potential outcomes. Knight discusses the particular problems that take place when an individual has no basis to identify all the discrete outcomes that can take place as the result of a given action, and the imprecision in estimating probabilities resulting from this. Knight does not claim that an actor facing uncertainty knows nothing about the future, but rather, that the knowledge they do have is subjective and difficult to transfer to others (Foss & Klein, 2012; Langlois & Cosgel, 1993). Among the implications of this distinction on the entrepreneurial process are the organization of the entrepreneurial firm and the need for alternatives to probabilistic decision making tools. In this section, the paper explores these implications.

Methods of firm organization Alvarez and Barney (2005) discuss the problems associated with organizing firms under conditions of uncertainty. They argue that received theories of the firm such as transaction cost economics and incomplete contract theory do not apply well where the context is uncertain, and suggest several possible alternatives for firms operating in an uncertain environment. Two of these, clan-based

and charisma-based governance, rely on the pre-existing presence of (or the ability to establish) a high level of trust and a shared vision of the future among members of the firm. The incentive alignment among firm members that results reduces the need for (likely ineffective) monitoring and control processes. Neither of these processes solves the problem of determining the appropriate actions to exploit an entrepreneurial opportunity in the absence of important information. However, they do provide a method by which decisions can be made and action can proceed. Given the importance of initial action and iteration to the creation process (Alvarez et al., 2012; Alvarez & Barney, 2007), developing a framework by which initial action can be taken is integral to the success of the actor.

Muddling through Among the ways that firms engaging in the creation process deal with this issue is through the related processes of “muddling through” (Lindblom, 1959) and effectuation (Sarasvathy, 2001, 2003). Lindblom (1959) contrasts what he calls the “root approach,” in which rational actors evaluate every possible decision in the universe based on predetermined value judgments and select the best course of action, with the “branch approach,” in which decision makers choose the best alternative from among a few related possibilities that resemble current practice. Through an iterative process, the decision maker can gradually settle on the best course of action. Since it is not realistic to expect an evaluation of every possible alternative in a complex system, much less an correct and complete accounting of all the consequences of each alternative as the “root approach” demands, Lindblom argues that decision makers very seldom use that method and to assume otherwise (as neoclassical economic theory and the discovery

view of entrepreneurial action do) is unrealistic. Lindblom puts forth this notion in the context of public policy decision making as a way of dealing with the informational problems associated with central planning (Hayek, 1945), but it applies equally well as a way of dealing with Knightian (1921) uncertainty. Whether particular pieces of information cannot be utilized in decision making because of the cognitive limitations of decision makers (as in the central planning problem) or because they do not exist (as in Knightian uncertainty), the underlying problem is the same.

Effectuation A more recent formulation of this, focusing more explicitly on decision making in the entrepreneurial context, is effectuation (Sarasvathy, 2001, 2003). Sarasvathy shares with Lindblom an emphasis on incremental decision making based on ends that evolve, rather than being determined *ex ante*. Instead of identifying a desired end and selecting between possible means to achieve it, effectuating actors identify the means available to them and select an end that is achievable with those means. Where causal reasoning (associated with Knightian risk in Sarasvathy, 2001) attempts to predict the future, effectual reasoning looks for aspects of the future that can be controlled. Reasoning in this fashion does not require the estimation of probabilities associated with particular means, and thus enables actors to deal with uncertain situations where such estimation is impossible.

Biases and heuristics A final way in which entrepreneurial actors might deal with an inability to use probabilistic decision making tools is through the use of biases and heuristics (Busenitz & Barney, 1997). By overgeneralizing from information that is available, actors “fill in the gaps” and take action even though all the information

relevant to a decision is not available. Through the course of this “hasty” process, further information is developed and the actor can refine its course of action as it proceeds.

Evolutionary nature

The second aspect of the creation process this paper will examine is that the process is evolutionary in nature. As opposed to the discovery process, where the planned flow of events and milestones is determined *ex ante*, the creation process proceeds in unanticipated (and unanticipatable, due to the uncertain context) directions as it proceeds. As the process continues and new information and constructions of reality are developed, the actors adjust their behavior to accommodate the new world it has created. The behaviors associated with this evolutionary process has been described in two primary ways: the variation-selection-retention model of Campbell (1960), and the emergent model of strategy making associated with Mintzberg (Mintzberg & Waters, 1985; Mintzberg, 1978). These two models will be described in the section that follows.

Variation-selection-retention The variation-selection-retention model associated with Donald Campbell (Aldrich & Kenworthy, 1999; Campbell, 1960), adapted from the biological realm, suggests that innovation and creativity come from a process of trial-and-error. In the course of taking action, small variation takes place, either from deliberate experiment or random chance. The most promising variations are expanded for further testing, and finally, they become part of typical practice. Campbell quotes from the writings of creative thinkers about their innovation practice; subsequent empirical work (at levels of analysis varying from the individual to the firm, and using both laboratory experiments and field observation) have observed this process directly

(e.g, Argote & Darr, 2000; Cohen & Bacdayan, 1994; Egidi, 1996; Szulanski, 2000).

Campbell points out that this variation is not necessarily blind, and indeed, discusses the attributes that make some thinkers better than others at the process. While he acknowledges the existence of more deliberate problem-solving strategies that might make an actor more successful at the variation-selection-retention process, he suggests that at the beginning, these arise from trial-and-error themselves.

Emergent strategizing processes The creation process relies on the gradual development of new information by the actor. As such, it relies on a strategy making process that can take this information into account. Such processes are a major focus of Henry Mintzberg's work, proceeding from his definition of strategy as "a pattern in a stream of decisions (Mintzberg, 1978: 935)," and thus, something that can change over time. He argues that three conditions are necessary for a strategy to be perfectly deliberate (which is to say, not at all emergent). First, the strategy must be precisely formulated and concretely articulated before it is implemented. Second, all members of the organization must understand and agree to the strategy. Third, it must be implemented as originally envisioned, which implies an environment that can be predicted or controlled (Mintzberg & Waters, 1985: 258). Obviously, these conditions cannot be met in the pursuit of a creation opportunity, and a strategy making process that is at least somewhat emergent is necessary. Mintzberg and Waters (1985) present several models of strategy making where feedback adjusts the strategy between its planning and execution. They suggest that this feedback is more likely to be influential where the original strategy is less articulated, where the planners take an active role in

execution, and where management has developed processes to take and use feedback from the environment (both internal and external).

Co-enactment

The final aspect of the creation process discussed in this section is that the creation process is co-enacted. Since the creation process is meant to change the social constructions of the marketplace such that a new opportunity is brought to life, it must engage with those in the environment whose constructions are changing, bringing them (and persuading them to adopt) a new vision of the world. This process is central to the evolutionary realist perspective within which creation opportunities are formed and exploited. Work in the creation view of entrepreneurial opportunities (e.g., Alvarez & Barney, 2007) has mostly described the creation process as path dependent (following Arthur, 1989). This is true in the sense that the creation process is historically contingent. However, it is important to emphasize that Arthur (1989) makes assumptions that are not compatible with the creation process. A recent “Point/Counterpoint” debate in the *Journal of Management Studies* (Garud et al., 2010; “Path Dependence and Path Creation,” 2010; Vergne & Durand, 2010) puts these issues into sharp relief. Arthur’s (1989) model of path dependence assumes that the self-reinforcing nature of the adoption process cannot be influenced by the producers, and that lock-in is final in the absence of an exogenous (to the producers and consumers) shock in the environment. These assumptions reflect the path dependence model’s view that producers take consumer preferences as given and cannot influence them (Vergne & Durand, 2010). Since

influencing consumer demand is one of the hallmarks of the creation process, this calls into question whether the creation process can properly be described as “path dependent.”

With that said, the term “path dependence” has often been used to simply point out that a particular process is historically contingent in some sense (Sydow, Schreyögg, & Koch, 2009; Vergne & Durand, 2010), and that larger point being made by Alvarez and Barney (2007) (among others) that the creation process is historically contingent still holds. Garud and his colleagues’ (2010) discussion of path creation, and the ways it differs from path dependence, provides us with a description of the way in which “history matters” that is more compatible with the entrepreneurial processes being described here. In particular, their discussion illuminates very well the activities inherent in the co-enactment process. The following brief discussion of the features of path creation, which is indebted to Garud and his colleagues’ recent *JMS* piece and in particular their Table 1 (2010: 769), will help to illustrate the key behaviors associated with this activity.

Initial conditions are constructed Both path dependence and path creation models start with a set of initial conditions. In the path dependence view, the initial conditions are given and the actors have no agency to construct them in novel ways. This can be likened to the role of resource endowments in the resource-based view of the firm, or the opportunity in the discovery view of entrepreneurial action. In this view, in order to arrive at a heterogeneous outcome, one must start from a heterogeneous beginning. By contrast, the path creation view starts with the construction of the initial conditions by an actor. In this view, it is not the objective situation that is important at first; it is the way that the firm *constructs* that situation that informs its initial actions. The firm’s initial,

tentative actions in pursuit of its path head in a particular direction, and they evolve that direction as more information is obtained. The impetus to action may be very small - path creation (and entrepreneurial creation; Alvarez & Barney, 2007) does not require substantial exogenous differences between firms or meaningful turbulence in the environment to get started. A change in the firm's construction of the conditions around it may be enough to start the process. Entrepreneurial logic supports the construction of situations in novel ways that might lead to the initial steps on the path.

Purposeful reaction to contingencies One of the key notions that Vergne and Durand (2010) rely on to separate path dependence from other ways in which history affects the present is the idea of contingent events. In a path dependent situation, stochastic events shape the future in unavoidable ways, and come to reinforce themselves. The way that actors might react to these contingencies is not part of the model, or, at least, there rapidly comes a point (assuming a self-reinforcing situation, like increasing returns to adoption of a particular technology) where only one course of action remains for the firm. This is consistent with the way path dependence is conceived of in Arthur (1989).

By contrast, path creation logic does not deny the often stochastic nature of the world, but actors under path creation retain (and use) the freedom to react to contingencies in purposeful ways. The process is reminiscent to Denrell, Fang, and Winter's (2003) description of the ways in which firms can react to fortunate situations they find themselves in by purposefully taking advantage of them. Denrell and his colleagues point out that differences in the knowledge of firms with respect to

antecedents to and uses for resources can lead to heterogeneity in performance. Further, they argue that given the complexity of calculating the value of resources (and the ever-changing nature of those values given their interdependence), such differences between firms are to be expected. They suggest, following Mintzberg (1978), that while the initial insight of a favorable combination of resources may be serendipitous, at some point, intentionality enters the picture and the actor deliberately moves to “finish the puzzle.” This process is similar to the way in which an actor in a path creation model will use their understandings of the past and their (often imperfect) knowledge of present circumstances to react to contingencies purposefully. They will try to advance their strategy, even as circumstances force them to evolve it. Entrepreneurial logic helps firms to maximize their utility from the imperfect knowledge they have. Its emphasis on experimentation, comfort with uncertainty, and refusal to adopt constraints helps the firm quickly take advantage of new learning and facilitates collective sensemaking (Weick & Roberts, 1993; Weick, 1995) in real time, in ways that might be genuinely new.

Agency is distributed In path creation logic, it is not only the focal firm that has agency to change its circumstances, but all the other actors in the system have agency to influence the situation as well. Learning from and anticipating the actions of others in the market is a critical activity. This most notably means customers, but can also include suppliers, rivals, and other stakeholders such as governments. These actions will shape consumer preferences and the “rules of the game” in dynamic ways not allowed for in a path-dependence model. In practice, the reaction of the market to the enactment of an opportunity is often of supreme importance, and taking the right lessons from it is crucial.

This is particularly important because the uncertain context in which the creation process takes place is characterized by incomplete information that entrepreneurial actors must react to as it becomes apparent.

This aspect of the creation process is particularly important because it impinges on the level of analysis on which creation capabilities should be understood. Given the wide distribution of agency under path creation, and the distributed nature of the emerging knowledge by which uncertainty is relieved as the creation process proceeds, the creation process, by definition, is a “team sport.” The capabilities that underlie performance within that process must also reside at the team level. It is important to note, however, that a “team” in this context does not necessarily consist of people in the same organization – a definition at variance with the way that term is generally used in the organizational behavior literature on this subject (Marks, Mathieu, & Zaccaro, 2001). In this sense, the “team” in which the capability resides consists of all those whom the entrepreneurial actor depends for resources necessary to form and exploit the opportunity. For example, the “friends, family, and fools” that creation entrepreneurs often depend on for financing (Bhide, 1992; cited by Alvarez & Barney, 2007) are part of the “team” as it is used here, and the capabilities embedded in entrepreneurial logic exist in that group as a whole.

ENTREPRENEURIAL LOGIC

In the previous section, this study identified three main aspects of the creation process: its uncertain context, its evolutionary nature, and the fact that it is co-enacted with others in the environment. In this section, the study turns to its primary

contribution: specifying the capabilities an entrepreneurial actor needs to be successful in these activities and contexts. As a group, these capabilities are what the study refers to as entrepreneurial logic. Entrepreneurial logic contains of three dimensions, one of which applies primarily to each aspect of the creation process: dealing with uncertainty requires *trust*, managing evolution requires *creativity*, and co-enactment requires *the management of team production processes*. In this section, defines each one of these dimensions more specifically and forges the link between each of these dimensions of entrepreneurial logic and its associated aspect of the creation process.

Trust

The first dimension of entrepreneurial logic is trust, which encourages dealing with uncertain contexts like those in which the creation process is enacted. Trust is defined here as “confident positive expectations regarding another’s conduct (Lewicki, McAllister, & Bies, 1998: 439).” Lewicki and his colleagues further define “confident positive expectations” as “a belief in, a propensity to attribute virtuous intentions to, and a willingness to act on the basis of another’s conduct.” In this case, the “others” referred to represent not only members of the entrepreneurial team (if the entrepreneurial actor is a team), but also all those in the environment (e.g., customers, suppliers, financiers) with whom the entrepreneurial actor must interact to form and exploit the opportunity.

Lewicki and his colleagues draw a conceptual distinction between trust and mistrust, which they define in terms of “confident negative expectations,” “a fear of, a propensity to attribute sinister intentions to, and a desire to buffer oneself from the effects of another’s conduct (Lewicki et al., 1998: 439).” They emphasize that trust and distrust,

while related, are conceptually distinct: the presence (or lack thereof) of trust does not necessarily imply anything about the presence of distrust, and vice versa. In this sense, trust can arise from experience, but the type of experience is important; it must be experience of positive outcomes, not the lack of negative outcomes over the period of an association. Trust cannot be formed from rational calculation based on the results of monitoring and control mechanisms, since those mechanisms, designed to detect opportunism, serve to reduce mistrust rather than create trust.

Since trust cannot be formed by rational calculation (which is, at any rate, impossible under conditions of uncertainty), models of trust are typically relational in nature. For example, Mayer, Davis, and Schoorman (1995) suggest that trust is a function of beliefs about ability, benevolence, and integrity of the trusted party, with individual propensity to trust (a psychological trait) moderating the relationship between all three beliefs and trust. Distrust enters into their model further in the process, as a moderator between trust and the decision to act. As experience is gained, trust beliefs are modified; Mayer and his colleagues posit a feedback loop between outcomes and the foundational beliefs. Empirical research has suggested that trust can function as a kind of heuristic; the belief that the trusted party is essentially benevolent provides a “rule of thumb” that facilitates action in the absence of rational calculations (Uzzi, 1997).

Evidence for this can be drawn from research on the impact of trust at the societal level. Putnam (1994) found that differing levels of trust in institutions contributed to drastically different economic outcomes in northern and southern Italy. Fukuyama (1996), taking a more general perspective, made similar arguments about the importance

of trust in making society function. They argue that trust engenders a process of spontaneous social exchange in which individuals behave altruistically and cooperatively, even beyond defined roles and obligations (Kramer, 1999). The importance of such behavior is magnified where roles and obligations can be defined only generally, as is the case under uncertainty.

In organizational contexts, research into organizational citizenship behaviors (OCB's) supports this view. In particular, group cohesiveness (an indicator of trust) and transformational leadership (which is designed to induce trust through articulation of clear goals and high expectations) have been consistently found to increase extra-role helping behaviors, loyalty, and initiative within organizations (Podsakoff, MacKenzie, Paine, & Bachrach, 2000). In an uncertain context, these extra-role helping behaviors are critical because it is difficult to define roles for organizational members *ex ante*. In addition, models of the formation of human and intellectual capital within the firm (e.g., Nahapiet & Ghoshal, 1998; Ployhart & Moliterno, 2011) include trust as a factor that facilitates spontaneous intellectual exchange. Ployhart and Moliterno (2011) note specifically that the more complex the environment, the more important trust becomes, because the work process depends more on interaction and exchange between parties. Nahapiet and Ghosal (1998) quote Boisot (1995: 193) on this point: "When the message is uncodified, trust has to reside in the quality of the personal relationships that bind the parties through shared values and expectations rather than the intrinsic plausibility of the message." Given the uncodifiability of knowledge that characterizes the uncertain context, these shared values and expectations take a central role. Thus:

Proposition 1: Trust on the part of the entrepreneurial actor is positively related to the successful enactment of creation processes.

Creativity

The second value that comprises entrepreneurial logic is creativity, defined (at the team level being adopted here) as “the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system (Woodman, Sawyer, & Griffin, 1993: 293).” As part of entrepreneurial logic, creativity is particularly concerned with the entrepreneurial actor’s ability to work through the evolution process. Since much of the information needed to exploit a creation opportunity is unknown and unknowable *ex ante* and must be developed gradually by the entrepreneurial actor, the creation process is characterized by experimentation and evolution. While not every decision the entrepreneurial actor must make in the formation and exploitation of a creation opportunity is characterized by Knightian uncertainty, many are, and thus, creativity is necessary to make this process work effectively. While some aspects of the particular actions being taken might be familiar, judgments of their novelty are specific to the domain in which they are taken, and the frames of thought (Weick, 1979) that accompany that domain. To the extent that the domain is ill-defined and appropriate frames of thought do not exist, any action taken will be “novel,” and any “useful” action will be creative. This is brought into sharp relief when it is considered that the alternative to creative methods of problem solving is habitual action (Ford, 1996). Habitual action is obviously not appropriate where the features of the context are unknown and unknowable. Of course, actors may utilize some aspects of old behavior

learned in previously experienced contexts. But, at the very least, “creative” adaptation will be required to fit behavior to the new context as it is increasingly well understood. The gradual unfolding of information in the creation process, and the fact that this information is developed by the entrepreneurial actors themselves (Alvarez & Barney, 2007), is a primary reason why the creation process has been described in evolutionary terms. While stochastic variation is important to BVSR models, even the Campbellian (1960) model explicitly allows room for agency on the part of the experimenter. Selection and retention obviously have a purposeful component, and while variation may take the form of serendipitous accident, it may also be the product of purposeful experimentation. To the extent that entrepreneurial actors can be successful at taking variation “into their own hands” through assisted trial and error, they will form and exploit opportunities faster than actors who must wait for opportunities to be created by the environment. To the extent that the ideas generated indeed prove to be useful, the creative actor will more quickly be able to adapt to the changing circumstances that characterize the creation process.

A more detailed description of this process is given by Simonton (2003). He describes a stochastic process of scientific creativity, integrating product, person, and process. He argues that this unifies the largely disparate approaches that focus primarily on process (problem solving techniques) and person (cognitive and dispositional factors). The most creative scientists are those who meld a wide variety of projects and heuristics with openness to unusual combinations and wide knowledge of the underlying situation. Put another way, creative scientists combine rapid and diverse experimentation with

novel selection logics. He supports this model with evidence from the career arcs of scientists that support his stochastic model of creativity. This is reminiscent of Campbell's (1960) idea that creative success derives from many trials accompanied by varying and novel criteria for selection and retention. In both cases, the essentially experimental method of creative scientists and artists mirrors the experimentation which characterizes the creation process.

The ability to generate many trials and efficiently select and retain the successful ones is also at the heart of successful emergent strategy. To the extent that strategy is not formulated in advance with the agreement of all actors, a trial-and-error approach to changes as new information is developed is almost inevitable. As the picture becomes clearer to all actors, the strategy may converge on something, but this convergence process is unlikely to happen perfectly or all at once. Instead, Mintzberg (1978) describes an iterative process in which changing circumstances and the efforts of management gradually force adaptation in the plan. The more information is generated through creative experimentation, the faster and more successful the process will be. Thus:

Proposition 2: Creativity on the part of the entrepreneurial actor will be positively related to the successful enactment of creation processes.

Management of team production processes

The final dimension of entrepreneurial logic, relating specifically to the co-enactment aspect of the creation process, is the management of team production processes. Given the importance of teamwork in organizational life, it is no surprise that

much scholarly attention has been focused on it, from both economic and psychological perspectives. From an economic perspective, the problems that must be overcome in a team environment were well defined by Alchian and Demsetz (1972) among others. Alchian and Demsetz (1972: 782) suggest that the problems associated with team production can be reduced by monitoring, which they define as including activities such as “measuring output performance, apportioning rewards, observing the input behavior of inputs as means of detecting or estimating their marginal productivity and giving assignments or instructions in what to do and how to do it.” For reasons put forward by Alvarez and Barney (2005), effective monitoring is difficult under conditions of uncertainty. For example, if the relevant outputs are not known, they cannot be measured.

In addition to the problems uncertainty poses to monitoring, even after one or more of the entrepreneurial actors possess enough knowledge to monitor effectively, the co-enacted nature of the creation process still presents problems in coordinating activity. In the creation process, the entrepreneurial actor must have a “team” with similar constructions of reality to proceed. Depending on the particulars of the situation, this “team” may consist of customers, suppliers, members of the organization not directly involved with the entrepreneurial actor (e.g., employees of other divisions within a larger company), financiers, or perhaps even members of the media. This is true whether the entrepreneurial actor is in itself a team, or is one individual. Even if the entrepreneurial actor is not itself a team, she has “teammates” that must be brought into the reality that the actor is constructing and “brought on board” with the goal. While obtaining support

from the marketplace is important to any entrepreneurial project, exploiters of exogenously existing opportunities have a number of ways of obtaining that support. Where the opportunity is well-defined and visible, rational calculation will enable the entrepreneurial actor to obtain financing and other needed resources, for example. By contrast, creation entrepreneurs must rely on teamwork processes to secure the assistance they need. While they may not be members of the same organization in the formal sense, at least some of these other actors in the environment will have to join the “team” in almost every conceivable case of entrepreneurial creation, and their participation will have to be managed.

From a more psychological perspective, one prominent model of teamwork processes was put forth by Marks, Mathieu, and Zaccaro (2001); it consists of ten processes divided into transition processes (deciding on mission and goals), action processes (monitoring progress toward those goals), and interpersonal processes (managing relationships). While a recent meta-analysis (LePine, Piccolo, Jackson, Mathieu, & Saul, 2008) examining the impacts of these team processes found that all three were significantly related to team performance. Where the nature of the task requires co-enactment as the creation processes does, this relationship should only be stronger. Some evidence for this can be drawn from LePine and his colleagues’ (2008) finding of a significant interaction on the teamwork process-performance relationship for interdependence, such that the more interdependent the task, the stronger the link between teamwork and performance.

A further example of this notion that is contextually similar to the creation process (and which focuses on top management teams) is the research project on decision making in high velocity environments by Bourgeois and Eisenhardt (e.g., Bourgeois & Eisenhardt, 1988; Eisenhardt & Bourgeois, 1988; Eisenhardt, 1989). This project studied the attributes of successful strategic decision making in the computer industry during a period of rapid change (the early-to-mid 1980's). These studies found, among other things, that effective communication and power sharing among top management teams were critical to success. Indeed, in companies that did not have effective means of information and power sharing, top managers engaged in politics and “back-channel” communication that proved destructive. Viewed through a path-creative lens, it might be said that the companies that recognized that agency in this situation was distributed, and arranged their teamwork processes to take account of that fact, were more successful in the turbulent environment they faced. These firms were also faster in reacting to contingencies; while they shared decision-making responsibilities, they communicated more efficiently than more top-down companies because their processes and decisions took place in the open.

Thus:

Proposition 3: Effective teamwork processes (i.e., transition, action, and interpersonal processes) on the part of the entrepreneurial actor will be positively related to the successful enactment of creation processes.

Interdependence of dimensions

Schwab (1980) identified a number of issues that must be addressed when assessing the validity of a psychological construct, including the uniqueness and interdependence of its dimensions. In other words, to be considered a single (though multidimensional) construct, the dimensions must be conceptually different from one another, and must covary enough to indicate that they point at a common concept. In addition, when taken together, they should better predict the outcome of interest (in this case, successful enactment of creation processes) than any of the dimensions do by themselves. Trust, creativity, and teamwork are clearly different conceptually, and given their differing relations to the necessary dimensions of the creation process, the presence of all of them should predict success at that process better than any do separately. By contrast, the issue of interdependence of trust, creativity, and teamwork is less intuitive. With that said, there are reasons to believe that these dimensions are interdependent, and in this section, the paper will briefly review some of them.

Trust and creativity are related Existing work on the antecedents of creativity in the workplace has adopted the intrinsic motivation perspective, which implies that supervisors using supportive styles tend to boost intrinsic motivation, and controlling supervisors tend to diminish it (Deci & Ryan, 1985). While the notion that intrinsic motivation is important to creativity has seen little empirical investigation (Shalley, Zhou, & Oldham, 2004), it is widely accepted in conceptual frameworks and is intuitively appealing. Consistent with this framework, a wide variety of studies have found that supportive supervision increases creativity in organizational settings (e.g., Amabile,

Conti, Coon, Lazenby, & Herron, 1996; Oldham & Cummings, 1996). Research on transformational leadership (e.g., Shin & Zhou, 2003) also lends support for this view. Since supportive supervision in general, and transformational leadership in particular, is associated with trust in leadership (Dirks & Ferrin, 2002), this suggests that trust should relate to creativity to at least some degree.

Another potential relation between trust and creativity can be derived from the already-mentioned Mayer, Davis, and Schoorman (1995) conception of trust in terms of willingness to be vulnerable to another party, with respect to ability, benevolence, and integrity. Recall that earlier, this paper (following Woodman et al., 1993) defined creativity in terms of the generation of novel and useful ideas. To the extent that novel and useful ideas are important to performance in the situation at hand (and thus, an important dimension of ability), being able to generate more ideas should lead to increased trust. Novel and useful ideas are important to the creation process almost by definition (Alvarez et al., 2012), and as such, in the creation context, creativity ought to lead to greater trust.

Trust and teamwork are related It is intuitive that teamwork processes of the type earlier described (following Marks et al., 2001) ought to be positively related to trust among members of a team. In particular, interpersonal team processes, which include conflict management, motivation and confidence building, and affect management, should be easier in an environment where parties trust each other. For example, the organizational justice literature suggests that individuals view even negative organizational actions more favorably when they believe that the procedures governing

an interaction are fair (Colquitt, Wesson, Porter, Conlon, & Ng, 2001). All other things equal, positive beliefs about the ability, benevolence, and integrity of teammates should make processes designed to increase cohesion more effective. Indeed, at least one follow-up study (Mathieu, Gilson, & Ruddy, 2006: 102) measured interpersonal team processes with a scale that included “members of my team really trust each other” as an item. While interpersonal teamwork processes are related to trust by definition, transition and action teamwork processes should be related to trust as well.

One potential example of the role of trust in transition processes can be seen in the Bourgeois and Eisenhardt studies of top management teams (e.g., Bourgeois & Eisenhardt, 1988) demonstrate the ways in which trust among top management teams enabled goal-setting decisions to be made efficiently and effectively. While these studies do not address trust specifically, they describe the ways in which the attempts of CEO’s to tightly control the discussion and actions of their executive teams led to unproductive political behavior and the development of factions within the team, with negative impacts on performance. Given the evidence that controlling behavior of this sort is likely to result in distrust of the leader by subordinates (e.g., Cialdini, 1996; Hochschild, 1983), it seems likely that the negative goal-setting processes observed by Bourgeois and Eisenhardt (1988) resulted from lack of trust to at least some extent.

Teamwork and creativity are related The teamwork processes outlined by Marks et al. (2001) have several different goals, but at the root of all them is problem solving. The problems could be related to goal selection, task completion, or interpersonal issues, but they all (at least potentially) demand creative solutions. Solving these problems will

require what Shalley and Perry-Smith (2008) refer to as team creative cognition. This is especially true in the creation process, given that co-enactment will often require teamwork among members that are not conventionally related to each other (e.g., members of the same organization), or are performing unusual or unfamiliar tasks. This lack of experience and similarity among team members is likely to cause problems including lack of schema agreement (Rentsch & Klimoski, 2001), and lower performance (Kozlowski & Ilgen, 2006). Overcoming these obstacles in the creation process will put a premium on the development of team creative cognition.

DISCUSSION

In the discussion section, the paper considers five primary questions. First, some consideration is given to the measurement of entrepreneurial logic. Second, the construct's relationship to effectuation (Sarasvathy, 2001) is discussed. Third, its relationship to an existing construct in this general space, entrepreneurial orientation, is explored. Fourth, the question of whether and when entrepreneurial logic can represent a sustainable competitive advantage is discussed. Finally, limitations of the study and opportunities for further research are explored.

Measurement of Entrepreneurial Logic

Each of the dimensions of entrepreneurial logic has been well established and studied in management literature. As such, numerous potential measures exist for each construct. For trust, one frequently used measure of trust in an individual is that reported in McAllister (1995); this measure has the merit of being broad-based, in that it tests trust along several different dimensions. Other studies have investigated different objects of

trust; for example, a recent study by Deutsch Salamon and Robinson (2008) measured employees' sense that they were trusted by management. Both of these would fall within the concept of trust under discussion here. For creativity, while the appropriateness of particular measures is the subject of scholarly dispute, common methods include subjective evaluation by experts (e.g., Amabile et al., 1996) and self-report questionnaires (e.g., Amabile, Barsade, Mueller, & Staw, 2005). For teamwork, scales corresponding to the dimensions put forward by Marks and colleagues (2001) have often been used. It should be noted that given the general nature of the constructs as put forth here, relationship between entrepreneurial logic and success at the creation process should be robust to differences in measurement; these particular measures are offered as examples. In addition to these quantitative measures, obviously, each of the dimensions would be observable using qualitative analysis as well.

One interesting measurement question that should be investigated in future research the extent to which the dimensions of entrepreneurial logic as presented here correspond directly to the aspects of the creation process they are matched with, or whether they each have effects on all the processes. For example, while trust is presented as being particularly important to dealing with uncertainty, effective teamwork will also increase goal alignment and should, therefore, also help the organization proceed effectively in an uncertain context. The questions of dimensionality and the effects of the dimensions on particular aspects of the creation process should be explored in future research.

Effectuation

As already discussed, effectuation (Sarasvathy, 2001) is a decision making process engaged in by entrepreneurs as a way to act in the presence of uncertainty. While it shares some characteristics with entrepreneurial logic, it operates on a different level of analysis and occupies a different place in the causal chain. Where EL operates on the whole community that an entrepreneurial actor must engage in order to achieve its goals, effectuation is performed by an individual. As already mentioned, the path creative perspective on entrepreneurship adopted here suggests that even in the case where one person is the entrepreneurial actor, key resources needed to form and exploit the opportunity are controlled by others and the ad hoc “team” that develops must work together effectively. If this is so, then the type of reasoning done by the entrepreneur, essential as it may be, must be only a part of the entrepreneurial process. However, it must be noted that nothing in this argument denies the central role of effectuation in the entrepreneurial process. Indeed, as previously discussed, facilitating effectual reasoning is one of the major ways in which EL facilitates the entrepreneurial process. It is the importance of effectuation to entrepreneurial success that suggests small group capabilities that enable members of those groups to effectuate are valuable.

Entrepreneurial Orientation

Like entrepreneurial logic, entrepreneurial orientation (EO) (Covin & Slevin, 1991; Lumpkin & Dess, 1996; Miller, 1983) is a set of capabilities underlying entrepreneurial action, which, in this case, is defined as entry into a new line of business. While dimensionalizations of the construct have varied somewhat, most studies that use it

consider three dimensions. Innovativeness is the tendency of organizational actors to be creative and to try new things, both with regard to internal processes and external market offerings. Risk taking is the tendency of the firm to act aggressively in the face of uncertainty. Proactiveness implies a forward-looking tendency with regard to the market and other aspects of the external environment. Some studies, including Lumpkin and Dess (1996), argue for two additional dimensions; autonomy and competitive aggressiveness. Autonomy is the ability of individuals and small groups within the organization to make independent decisions and act without restrictions from bureaucracy. Competitive aggressiveness consists of a strong desire to outperform rivals and the willingness to directly challenge competitors in the market place. Some studies treat EO as unidimensional in its effects with respect to firm performance (which is to say, one measure encompassing all five constructs is as predictive as separate measures), others as multidimensional; the available evidence suggests that a unidimensional approach is appropriate (Rauch, Wiklund, Lumpkin, & Frese, 2009).

Entrepreneurial orientation has been variously described as a strategic orientation (Wiklund & Shepherd, 2003), a strategy-making process (Rauch et al., 2009), a propensity to act in certain ways (Lumpkin & Dess, 1996), and a dominant logic (Lumpkin, 2010). As such, it operates on the business unit level, by contrast with EL at the team level. It is not a list of things to do to be entrepreneurial, but concerns itself with how things are done entrepreneurially. While EO is not a theory, strictly speaking, the literature has used it to generate predictions; many studies have tested the relationship between EO and firm performance under various conditions. An EO construct consisting

of three dimensions was found to correlate positively with firm performance in a recent meta-analysis (Rauch et al., 2009), at roughly a .242 correlation. The meta-analysis also suggested that moderators of the relationship between EO and performance exist; a few have been examined (like firm size and industry) but Rauch and his colleagues call for further work in this area.

One of the reasons that such a large literature has developed around EO (the Rauch et al. meta-analysis (2009) identified 134 studies that use EO in some way) is the fact that there are well-accepted measures of the constructs. The vast majority of studies used measures derived from Covin and Slevin (1986, 1989), that survey respondents on the strategic posture at work in the firm. This measure is based on three dimensions and, consistent with the processual nature of the construct, asks respondents about their perception of the general management philosophy of the firm instead of specific actions.

The theoretical mechanisms by which EO leads to firm performance generally revolve around the idea that aggressively pursuing market opportunities leads to first-mover advantages over competitors, and being highly innovative leads firms to perceive new opportunities that rivals do not (Wiklund, 1999; Zahra & Covin, 1995). EO has been described as an “aggressive, undo the competitor strategic posture (Rauch et al., 2009: 762).” It is clear that the dimensions focus on gathering, and then exploiting, information about competitors and then “beating them to the punch.” The competitive aggressiveness dimension addresses the point specifically; holistically, the high EO firm is expected to improve its performance not only by being fast, but by being faster than its competitors.

This external focus will lead to substantial improvement in products and processes, but only if the external environment contains the seeds for this improvement. The efficacy (or, at least, the importance) of this strategic posture depends on entrepreneurial opportunities being generated outside the firm. If a technological change or other exogenous shock creates a market opportunity, acting aggressively to take advantage of it matters a great deal. Where the action to take is obvious to everyone in the firm because a competitor has started taking it, trust is not at a premium, but the ability to execute quickly and aggressively is.

By contrast, the internal focus and processes that are the concern of entrepreneurial logic become much more important where the opportunity arises endogeneously to the firm, as in the creation process. In this process, being first is significantly less important; competitors cannot react because the first move, by definition, must belong to the focal actor. The key question of the creation process is forming the opportunity in the first place. For that, trust, creativity, and teamwork will be at a premium, as already discussed. Executing aggressively may even be a drawback in this circumstance, given that initial moves are likely to be in the wrong direction.

Entrepreneurial logic as sustained competitive advantage

Barney (1991) argued that in order to represent a sustained competitive advantage, a resource such as entrepreneurial logic must be valuable, rare, and difficult for competitors to imitate. There is little doubt that values such as trust, creativity, and teamwork are difficult to imitate, due to their social complexity and causal ambiguity (Barney, 1986). This is not to say that it is impossible to imitate these values or build

them in an organization which does not possess them, but doing so will almost certainly take a long time and may not work at all. Similarly, while almost every organization values these dimensions to at least some degree, some firms undoubtedly value them more than others due to various idiosyncratic factors. Therefore, entrepreneurial logic is almost certainly rare and inimitable.

The key question then is when a creation capability would be valuable to a firm. Certainly, under some circumstances, trust, creativity, and teamwork can increase organizational performance, and thus be considered valuable. However, this is not universally the case; entrepreneurial logic, like anything else, comes at a cost. Building a climate of trustworthiness requires at least some level of fairness (Burke, Sims, Lazzara, & Salas, 2007), which is not free. Allowing employees to be creative may distract them from their main job, which wastes resources and may slow down the organization. The communication processes that go into effective teamwork take time as well, and while they seem to improve performance in many cases, obviously, this will reach a limit. This question is ultimately an empirical one and represents a valuable opportunity for further research.

CONCLUSION

In this paper, the construct of entrepreneurial logic was defined and developed. Entrepreneurial logic is that set of capabilities that supports the efforts of entrepreneurial actors to engage in the creation process. It consists of trust, creativity, and teamwork, and helps actors to deal with an uncertain context, experiment effectively, and co-enact entrepreneurial opportunities with others in the environment. It is distinguished from

entrepreneurial orientation, the major existing construct in this space, which represents a capability appropriate to the discovery process.

The primary contributions of this study are two-fold. First and most importantly, through new construct of entrepreneurial logic, it beings to define the capabilities which underlie successful use of the creation process. This will aid empirical investigation of creation theory, as well as adding to theoretical understanding and making the concept more useful in practice. In addition, it contributes to the definition of the creation process begin by Alvarez and her colleagues (Alvarez et al., 2012; Alvarez & Barney, 2007). Given that this literature is still at a nascent stage, this represents an important step in theory development.

The study has two primary limitations. Since it is primarily concerned with the entrepreneurial actor and the entrepreneurial process, it does not put forth a detailed model of the psychological process by which the dimensions of entrepreneurial logic do their work. Existing work on all three of the constructs presents several bases from which such a task might be done. Relatedly, as noted, each of the dimensions has various types and conceptualizations. For example, trust can be affective or cognitive, and teamwork has task and relational dimensions. These differences may have important implications for the creation process.

In addition to the already noted opportunities for further work related to the measurement of entrepreneurial logic and the question of when it might represent a sustainable competitive advantages, another possible direction (suggested by the study limitations noted above) would be to further develop the microfoundations of

entrepreneurial logic. As suggested, more detailed models of the ways the dimensions influence behavior as the creation process unfolds would refine our understanding of what capabilities are important, when they are important, and why. Finally, further research should examine the ways in which a firm that wants to develop a creation capability can do so. As previously mentioned, such a capability should be a source of competitive advantage under at least some circumstances; being able to develop this capability should be of interest from both theoretical and practical perspectives.

CHAPTER 2: TOWARD AN ENTREPRENEURIAL LOGIC OF TRUST

The problems associated with establishing and facilitating cooperation under uncertainty have been the object of several important studies in entrepreneurship in the last several years (Alvarez & Barney, 2005, 2007; Foss & Klein, 2012; Sarasvathy, 2001). One important issue facing entrepreneurial actors under uncertainty is that in the absence of information about necessary inputs and potential outputs associated with the opportunity, decision rights are impossible to assign appropriately, and Williamsonian forms of governance are difficult to execute. Since actors cannot make a “rational” (that is, based on a calculation of costs and expected benefits) decision to cooperate where neither costs nor expected benefits can be reliably estimated, a decision to commit resources must be based on a decision to make oneself vulnerable for other reasons. One solution that has been posited for this problem is trust among the entrepreneurial actors and those from whom they need to obtain resources (Craswell, 1993; Goel & Karri, 2006). An example of this type of solution is the reliance of entrepreneurial firms on “friends, family, and fools” for financing (Bhide, 1992). In fact, the development of trust between entrepreneurial actors and others in their environment is the key problem facing actors under uncertainty; without trust, it is difficult to do anything at all.

While various theorists have identified trust as an important factor in the organization of entrepreneurial firms, the antecedents to trust in these circumstances have received less attention. Theorists of trust at a societal level (often working on related constructs such as social capital) discuss the importance of pre-existing links, enforcement mechanisms, and similar ways to ensure compliance (e.g., Coleman, 1988; Putnam, 1994). However, under uncertainty, these mechanisms are not available either. By definition, under uncertainty, pre-existing experience is not applicable to the current situation and reliable enforcement mechanisms are difficult to come by.

By drawing on the insights of entrepreneurial theory, and in particular, an understanding of the entrepreneurial creation process (Alvarez et al., 2012; Alvarez & Barney, 2007; Garud et al., 2010), this paper investigates the role that creativity plays in the development of trust. In particular, it establishes the ways in which Knightian uncertainty (Foss & Klein, 2012; Knight, 1921) makes creativity a capability which facilitates trust in organizations that wish to form and exploit entrepreneurial opportunities. Using data from college football teams, it establishes creativity as related with trust in the absence of uncertainty, and advances understanding with respect to the boundary conditions within which the entrepreneurial logic theory of performance applies.

THE EFFECTS OF UNCERTAINTY ON THE ENTREPRENEURIAL PROCESS

In a recent book, Nicolai Foss and Peter Klein (2012) suggest that judgment under uncertainty is the *sine qua non* of entrepreneurship. While Foss and Klein might be relatively unique in their emphasis on uncertainty as the defining issue in

entrepreneurship, they are far from alone in placing uncertainty and strategies for dealing with uncertainty at the center of their analyses (e.g., Alvarez & Barney, 2007; Sarasvathy, 2001). The role of uncertainty is key to the theory of the entrepreneurial firm; if the information necessary to monitor transaction partners or direct their efforts is unknown and unknowable, market and hierarchical methods of governance are unavailable (Alvarez & Barney, 2004). In addition, since the value of a particular resource is determined by context and is constructed by actors to at least some degree (Baker & Nelson, 2005; Garud et al., 2010), the presence of uncertainty (implying that important aspects of context are unknown and existing constructions might not be valid) presents the entrepreneurial actor with important challenges. This section explores the implications of uncertainty on the entrepreneurial process, with particular attention to its impact on the ability to communicate important pieces of information both within the entrepreneurial actor (if it is a team) and to other important actors in the environment.

Uncertainty: what is it?

Frank Knight (1921) is typically credited with introducing the concept of uncertainty to economic and managerial discourse. Runde (1998: 540) offers a typical formulation of the distinction drawn by Knight between risk and uncertainty:

1. Situations of Risk. Situations in which the decision-maker assigns probabilities to events on the basis of 'known chances', where chances are defined as numerical proportions of otherwise (in some sense and in some degree) homogeneous xs that are also ys; and

2. Situations of Uncertainty. Situations in which the decision-maker is unable to assign probabilities to events because it is not possible to calculate chances (where there are insufficient xs homogeneous enough to form classes within which the proportions of xs that are also ys can be determined).

Knight suggests that while almost all decisions (both in and out of the business world) fall into the latter category, people do make and rely on essentially probabilistic judgments in cases like this. It is indeed true that conceptually speaking, it makes little sense to speak of “degrees of uncertainty” (Alvarez & Barney, 2007), because in any given case, information relevant to a decision is either knowable or it is not. However, Knight argues that the conclusions that managers reach do have meaningful degrees of certainty attached, at least in the consideration of the people making them. Thus, it makes sense to consider ways to reduce the uncertainty associated with any particular decision. Foss and Klein (2012), building on this discussion and that of Langlois and Cosgel (1993), argue that the real issue associated with uncertainty is not that it “leave[s] decision-makers in epistemological bedlam,” but rather that it requires distinctive skills on the part of the entrepreneur to overcome the handicaps imposed by the unknown and unknowable pieces of information critical to the decision. To understand the nature of these skills, it may be helpful to examine Knight (1921: 239)’s discussion of methods of dealing with uncertainty:

“We may call the two fundamental methods of dealing with uncertainty, based respectively upon reduction by grouping and upon selection of men to “bear” it, “consolidation” and “specialization,” respectively. To these two methods we must add two others which are so obvious as hardly to call for discussion: (3) control of the future, and (4) increased power of prediction. These are closely interrelated, since the chief practical significance of knowledge is control, and both are closely identified with the general progress of civilization, the improvement of technology and the increase of knowledge. Possibly a fifth method should be named, the “diffusion” of the consequences of untoward contingencies. Other things equal, it is a gain to have an event cause a loss of a thousand dollars each to a hundred persons rather than a hundred thousand to one person; it is better for two men to lose one eye than for one to lose two, and a system of production which wounds a larger number of workers and kills a smaller number is to be regarded as an improvement. In practice this diffusion is

perhaps always associated with consolidation, but there is a logical distinction between the two and they may be practically separable in some cases. We must observe also that consolidation and specialization are intimately connected, a fact which will call for repeated emphasis as we proceed. In addition to these methods of dealing with uncertainty there is (6) the possibility of directing industrial activity more or less along lines in which a minimal amount of uncertainty is involved and avoiding those involving a greater degree.”

We might restate Knight’s six approaches as three basic strategies: (1) strategies for proceeding with action in the face of uncertainty (by choosing people to bear it), (2) strategies for the development of critical information (through consolidation, control, prediction, and diffusion), and (3) simply avoiding areas of activity where key decisions are characterized by uncertainty. The analysis that follows assumes that (3) is not an option – it applies to situations where uncertainty is central enough to the entrepreneurial activity being pursued that it is impossible to avoid. In the next section, the manuscript examines the capabilities necessary to bear uncertainty; after that, it examines the capabilities underlying the reduction of uncertainty through the development of critical information. In particular, it examines the role of entrepreneurial logic (Saxton, Alvarez, & Barney, 2013) in enabling entrepreneurial actors to overcome the limitations that uncertainty places on them.

Acting in the face of uncertainty: the role of trust

The problems associated with firm formation and entrepreneurship in the presence of uncertainty have received substantial attention in recent years. One particularly systematic treatment of this issue is the creation theory of entrepreneurial action (Alvarez & Barney, 2007); other work on this topic has included the stream of literature on effectuation (Sarasvathy, 2001) and Foss and Klein’s (2012)’s already-mentioned book

on entrepreneurial judgment. In addition to this, the impact of uncertainty on firm formation (Alvarez & Barney, 2005; Alvarez & Parker, 2009) and entrepreneurial decision making (e.g., McKelvie, Haynie, & Gustavsson, 2011; McMullen & Shepherd, 2006) have increasingly received attention. All of these point to the problems that arise when information key to the success of the enterprise is unknown and unknowable when actors start their work. While these issues have been discussed from several perspectives, underlying them all is the difficulty of communicating plans and ideas in the face of uncertainty (Foss & Klein, 2012).

Each person has different levels of knowledge applicable to a particular circumstance (Hayek, 1945), but in the absence of a way to relate that circumstance with previous experiences¹, it is difficult to communicate that knowledge to others. Without that communication, the coordination needed to sustain collective action is difficult to achieve. If those who control resources necessary for the formation of a given entrepreneurial opportunity lack pieces of information essential to the process of its formation and enacting, and that information cannot be communicated to them, they make themselves very vulnerable if they elect to participate anyway. While a successful entrepreneurial team can take action using very limited resources (Baker & Nelson, 2005; Sarasvathy, 2001), every opportunity has resources without which it cannot be successful. Thus, without at least some resource holders' (who, it should be noted, might themselves be on the entrepreneurial team) willingness to make themselves vulnerable to the

¹ Knight (1921) places particular emphasis on the reduction of uncertainty by grouping like cases into understandable (and communicable) phenomena.

judgments of others and the results of those judgments, entrepreneurial action in the face of uncertainty is impossible.

Effectuation and the difficulty of communication under uncertainty

One good example of the role trust must play in the entrepreneurial process under uncertainty can be seen from the effectuation process (Sarasvathy, 2001). The effectuation framework has spawned a very broad conceptual and empirical literature and is a well-accepted conception of the decision making process under uncertainty. It suggests that under uncertainty, expert entrepreneurs reason from ends to means instead of from means to ends. This is to say, they select from the possible effects that can be created given the resources they control and the situation in which they find themselves, instead of choosing a particular outcome and then arranging the situation to make that outcome possible. Obviously, to the extent that the desired final outcome is ill-defined, a decision making process which requires careful definition of that outcome *ex ante* is suboptimal. Therefore, effectuation is a better approach for decision-making under uncertainty than the available alternatives.

The problem here is that effectuate judgment is a highly subjective process. If the final goal is clearly pictured, then the appropriate ways to reach that goal can be the subject of rational discussion within and without the entrepreneurial team. The chances of success can be estimated based on the strategies which will be employed, and actors can each decide whether or not to go forward based on the probabilities they estimate. By contrast, where effectuation is employed, the actions of each member of the entrepreneurial team are impossible to predict *ex ante*, by definition. All that is known is

that each actor will respond to contingencies as they occur, and the final goal will gradually become clear as relevant information is developed by the actors. The process each actor is using to make decisions is not only opaque to the rest, it cannot be made more transparent by definition; the information needed to make it so does not exist.

The only way that voluntary exchange can take place in such an environment is for the actors to make themselves vulnerable to the results of each other's effectual judgments. With very little to go on, each actor must resolve to trust the results of each other's thinking. They must commit whatever resources are needed to the joint effort in the hopes that the results will be good (but lacking any real evidence that this will be so). Sarasvathy and Dew (2008) remind us that effectuation processes, proceeding commitment by commitment, may of themselves facilitate this process. They answer Goel and Karri (2006)'s claim that effectuation supposes over-trust (which they, following Goel et al. (2005: 479), define as "trusting another actor more than is warranted by an objective assessment of the situation") by pointing out that the very concept of over-trust is problematic where decisions are not made through "objective assessments." They suggest that the effectuating entrepreneur, with an affordable loss level in mind and proceeding through a series of small commitments, does not necessarily need to trust to take action.

This position is persuasive insofar as the concept of an "objective assessment" is problematic where key pieces of information necessary for such an assessment do not exist, and effectual entrepreneurs (or indeed, anyone who manages to act in the face of uncertainty), if they are to proceed at all, will have to do so using some other process.

However, it is not enough to say simply that all actors can effectuate and so do not face the problem, as Sarasvathy and Dew (2008) seem to do. While the nature of the vulnerability may be different for an effectuating decision maker, they still have to make themselves vulnerable to the results of someone else's thinking if action is to proceed. Their decision to commit resources, regardless of the ability they maintain to influence the future, and tentative though it may be, still requires them to act on the basis of factors they do not and cannot fully understand. To take such an action requires trust by definition.

Trust: calculative or not?

This vulnerability is at the heart of the trust construct (Lewicki et al., 1998), whether it is based on rational calculation of the sort not possible under uncertainty (Williamson, 1993), or is based on judgments of a more relational nature (Craswell, 1993). It is important to note that trust, as the term is used in common parlance, includes both of these concepts. While both types of trust share a willingness to make oneself vulnerable to others, as Williamson points out, making oneself vulnerable based on a rational assessment of expected risk and reward and factors relating to the specific party being trusted (where that information is available) is not precisely the same thing as trusting in the absence of calculated reasons to do so. As Williamson (1993) argues, calculative trust is, in some sense, not really trust in the proper sense of the term. Therefore, creativity among the actors, or “the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social

system” (Woodman et al., 1993: 293) can actually reduce the extent to which the actors perceive and report trust by placing their relationships on a different footing. .

The production of trust: the role of creativity

While trust may be necessary for action in the face of uncertainty, it is difficult to sustain in the absence of important information. While Williamson’s (1993: 486) argument that “calculativeness thus always reappears,” and thus, in commercial relationships, almost everything that looks like trust is based on rational calculation, may be problematic in certain respects, Williamson’s point that real, noncalculative trust is difficult to sustain is well taken. Therefore, we must consider carefully the ways in which the need for noncalculative trust (in Williamson’s formulation) can be reduced, and the implications of such a reduction. This can be done by returning to Knight (1921). In addition to specialization, or choosing someone to act in the face of uncertainty (someone who, of course, must be trusted in a noncalculative way by the other parties with whom they deal), the other basic response to uncertainty put forth by Knight (1921) is that of developing information to make the uncertain situation more tractable. He suggests that the growth of “specialized agencies for the supply of information help[s] to bridge the wide gap between what the individual business manager knows or can find out by the use of his own resources and what he would have to know to conduct his business in a perfectly intelligent fashion (Knight, 1921: 261).” Information such as this, he argues, enables entrepreneurs to rely on rational judgment more, and biases, heuristics, (Busenitz & Barney, 1997) and intuition (especially, in this context, intuition about which parties ought to be trusted in the absence of information necessary for rational

calculation) less. This process reduces uncertainty, but also reduces (without totally eliminating) the need for trust of a relational nature. Thus:

H1: Creativity is positively related to trust in entrepreneurial organizations.

H2: This relationship is moderated by uncertainty such that in the presence of uncertainty, the relationship is weaker.

DATA AND EMPIRICAL STRATEGY

Empirical Setting

Professional and collegiate sports have become an increasingly common setting for organizational research (Wolfe et al., 2005). They offer a variety of advantages, such as reliable and valid measures of performance (at least, as compared with other organizational settings) and (relatively) easy availability of data. In particular, the empirical setting for this project, major college football in the United States, is advantageous for the study of organizational performance under uncertainty. In NCAA football, frequent personnel turnover creates uncertainty – since (absent unusual circumstances) no one is allowed to play college football for more than four seasons, key personnel are constantly being replaced. In addition, while the rules of football are relatively static, offensive and defensive planning and schemes are constantly evolving and turnover of coaches means that even familiar rivals may change their strategies substantially from one season to the next.

This study examines a sample of 32 organizations, all of which played in the NCAA Division I Football Bowl Subdivision (the highest level of competition in the United States) from 2006-2012. This sample represents slightly less than one-third of the

schools that were active in that division at that time, and represents the schools whose names are in the first 32 alphabetically. The data for the study was gathered from two sources. The newspaper articles used in the measures of trust, creativity, and teamwork were gathered from Lexis-Nexis and represent a complete universe of articles which mention the name of the head coach for each team-season. The measures of performance and uncertainty were gathered using gameplay data from cfbstats.com, which include all games involving at least one Division I FBS team over the period 2005-2012.

Estimation Strategy

The analysis estimates the effects of creativity on trust, given a particular level of uncertainty present for the organization, on a team-season level. The equation estimated takes the form:

$$y_{it} = \alpha_1 C_{it} + \alpha_2 P_{it} + \alpha_3 E_{it} + \alpha_4 X_{it-1} + c + \varepsilon_{it}$$

where i indexes the organization, t indexes time (in seasons), y_{it} is a measure of organization i 's trust in season t , P_{it} represents organizational performance, C_{it} represents creativity, and E_{it} measures teamwork. X_{it-1} is the win percentage for the previous year, designed to control for returning talent. Our primary parameter of interest is α_1 , which provide estimates of the way in which creativity impacts trust as the various levels of U (which is a dichotomous variable). The results of subsample analyses on the different values of U are presented here, for ease of interpretation.

Variables *Trust, creativity and teamwork*. The primary dependent variable in this study is trust, and creativity is an important independent variable. These are measured by

analyzing media reports which discuss each team, through a multi-step process. First, a dataset consisting of every news story indexed in Lexis-Nexis that mentions the current head coach (current for each season) and the name of the school was gathered for each organization in the sample. The total dataset consists of approximately 100 million words. Second, following recent studies of entrepreneurial orientation (e.g., Short, Broberg, Coglisier, & Brigham, 2010), a lexicon was built to enable computer-aided text analysis (CATA) for each construct. This lexicon started from the list of synonyms for each construct found in Rodale's Synonym Finder (Rodale, Urdang, & LaRoche, 1986). To construct the final dictionary, each synonym was rated by the author and two other experts for congruence with the construct it was meant to represent. The three generated lists were very similar; the primary author's list was used in the analyses presented but robustness checks made with each list generated substantially similar results. Third, the dataset was searched for the number of mentions of the identified set of keywords. Fourth, each mention was manually coded (by the primary author) as either referring positively or negatively to the level of the construct under consideration in the organization, referring to another team or something unrelated to the level of the construct under consideration (e.g., a reference to "trust" among professors in the business school), or as a duplicate news story. The results presented here include only those mentions coded as positive; the results of robustness checks analyzing all mentions are substantially similar. In the dataset, these variables are expressed in number of mentions per 100,000 words. In the present study, trust and creativity are instrumental

variables, and (following the theoretical framework put forth in Chapter 1 of the present study) teamwork is included as a control.

Uncertainty. In the context of college football, a number of factors drive the level of uncertainty faced by an organization at any given time. Each season, every team faces the necessity of replacing players who have completed their allowable participation.

This challenge will be particularly notable at focal positions, especially at quarterback. A team may be replacing a coach. Rivals may have replaced their coaches, suggesting that previous results may be a poor guide to the challenges the organization will face from them going forward. While all of these transitions may be causes of uncertainty for the management of an organization in this context, in this dataset, only a quarterback change was significantly related (at $p < 0.05$) to a lower won/loss total the following season.

Given that we expect uncertainty to reduce performance, (and consistent with evidence from the press and study informants on the dramatic potential impact of changing quarterbacks), uncertainty in this study was conceptualized in terms of changing quarterbacks. For simplicity of interpretation, a dichotomous measure was used here: the sample was divided into organizations where less than 10% of pass attempts from the previous season were made by players currently on the roster, and organizations where more than 10% of the previous year's pass attempts were made by returners. The dividing line is set at 10% for two main reasons: first, it produces two groups of roughly equal sizes in this sample, and secondly, it strikes an appropriate balance between two potential issues with this measure. The first of these are the fact that it is common to employ reserves at the end of non-competitive contests, which will not represent

meaningful experience. On the other hand, a quarterback may have a substantial amount of experience (with the corresponding reduction in uncertainty about their performance) despite not throwing the majority of passes for his team in a given season.

Performance. Organizational performance, due to the theoretically important links between trust, creativity, teamwork and performance (see Chapter 1) is included as a control in this study. In this study, performance is measured by won/loss percentage for each season. All games are counted, including those against teams that are not in Division I FBS and post-season games (bowls). While this measure is incomplete as a measure of ultimate organizational success (interviews done for the study suggest that coaching staffs are also evaluated on players' scholastic achievement, financial performance, and other metrics), winning football games is a primary goal for every organization.

Summary statistics for all variables, for both the entire dataset and the halves of the samples with and without new quarterbacks, are presented in tables 1-3.

		Mean	S.D.	v1	v2	v3	v4	v5
v1	Win Percentage	0.52	0.23	1.000				
v2	Last year's win percentage	0.52	0.22	0.544	1.000			
v3	Trust	1.79	1.51	-0.088	0.013	1.000		
v4	Creativity	0.36	0.56	0.075	0.034	0.219	1.000	
v5	Teamwork	0.17	0.39	-0.060	0.068	0.373	0.191	1.000

Table 1. Summary statistics for entire dataset (N=144)

		Mean	S.D.	v1	v2	v3	v4	v5
v1	Win Percentage	0.51	0.22	1.000				
v2	Last year's win percentage	0.54	0.22	0.665	1.000			
v3	Trust	2.00	1.62	-0.077	0.106	1.000		
v4	Creativity	0.42	0.61	0.022	0.025	0.231	1.000	
v5	Teamwork	0.16	0.34	-0.050	0.102	0.359	0.409	1.000

Table 2. Summary statistics for teams with new quarterbacks (N=67)

		Mean	S.D.	v1	v2	v3	v4	v5
v1	Win Percentage	0.53	0.24	1.000				
v2	Last year's win percentage	0.51	0.22	0.457	1.000			
v3	Trust	1.61	1.39	-0.093	-0.099	1.000		
v4	Creativity	0.31	0.52	0.135	0.029	0.183	1.000	
v5	Teamwork	0.18	0.44	-0.067	0.049	0.409	0.026	1.000

Table 3. Summary statistics for teams with returning quarterbacks (N=77)

RESULTS

The results of panel regressions for the dataset as a whole, and for each of the divisions of the dataset, are presented in table 4. The dependent variable in all of these analyses is the team's level of trust.

Dependent variable is trust in all models			
Grouping:	All Data	New QB's	Returning QB's
Wins	-0.858	-1.435	-0.234
	(0.565)	(1.062)	(0.648)
Lagged wins	0.646	0.985	-0.186
	(0.563)	(1.074)	(0.641)
Creativity	0.300	0.293	0.513*
	(0.200)	(0.344)	(0.252)
Teamwork	0.850**	1.224*	1.109***
	(0.269)	(0.542)	(0.293)
Constant	1.561***	1.891**	1.458**
	(0.045)	(0.621)	(0.457)
Team Effects?	Yes	Yes	Yes
Year Effects?	Yes	Yes	Yes
R ² within	0.0881	0.1288	0.2129
R ² between	0.2960	0.1693	0.2194
R ² overall	0.1627	0.1605	0.2071
Number of observations	144	67	77
Number of organizations	32	30	32

Table 4. Results of regressions

+ p<0.10, * p<0.05, ** p<.01, *** p<.001

As seen in Table 4, while H1 is largely unsupported there is some support for H2, given that the coefficient on creativity in the low uncertainty subsample is significantly different from zero, whereas this is not the case for the sample as a whole and the high

uncertainty subsample. In addition, the point estimate on the effect of creativity on trust is roughly 80% higher in the low-uncertainty condition than in the other two. While this result (which represents a difference of roughly two-tenths of one mention of creativity per mention of trust) is of limited practical significance, it does provide some support for the theoretical arguments of the present study.

DISCUSSION

Under uncertainty, the ability of entrepreneurial actors to generate trust in themselves and their enterprises is critical. However, the antecedents of that ability have received little scholarly attention. By using a framework based on entrepreneurial logic (Saxton et al., 2013) the present study investigates one of these antecedents: the relationship between creativity and trust. In particular, it finds some evidence to suggest that under uncertainty, the relationship between creativity and trust is weaker than it is in the absence of uncertainty, a finding which suggests that the establishment of relational trust is paramount in uncertain situations.

While the results obtained in this paper are statistically significant, as noted earlier they have limited practical significance. In addition, they are not entirely as expected given the framework put forth in Chapter 1 of the present study. In this section, possible empirical issues of this study are examined, with a particular focus on construct measurement. In addition, results of analysis of the model from Chapter 1 are presented, and opportunities for further research in this area are discussed.

Measures issues and potential improvements

While the measures used in this study are supported by recent literature, there are some reasons to believe that they do not truly represent the underlying constructs as well as might be hoped. In particular, it may be the case that the discourse of coaches and others about the dimensions of entrepreneurial logic are driven by events such that they become topics of conversation when they might not be present. For example, a coach's occasion to express trust in his team's quarterback is often a media question pointing out his recent poor play. The ubiquity of the phrase "dreaded vote of confidence" demonstrates a popular understanding of this phenomenon. Similarly, a spate of stories about teamwork may be the result of perceived problems, which draw quotes from the coach extolling his players' teamwork. It is possible that such quotes may not truly reflect the state of organizational processes currently present. While it is difficult to quantify these effects in the dataset, they are undoubtedly present to at least some extent and may drive the equivocalness of reported results.

In addition to the equivocalness and lack of robustness of present results, further evidence of these issues arises from the complete lack of statistically significant results with performance as a dependent variable. Despite using several different measures of performance, four different measures of uncertainty, and various sets of control variables, no specification was found in which the dimensions of entrepreneurial logic had a significant (statistically or otherwise) effect on firm performance. One sample of these results is presented in Table 5. Table 5 presents the results of a series of regressions (at varying levels of uncertainty, using the same technique in the reported results) using

team win percentage as the dependent variable, with the dimensions of entrepreneurial logic as the primary dependent variables and a similar set of controls to that used in the primary results.

Dependent variable is win percentage in all models			
Grouping:	All Data	New QB's	Returning QB's
Lagged Wins	0.566***	0.698***	0.438***
	(0.073)	(0.094)	(0.111)
Trust	-0.013	-0.018	-0.007
	(0.012)	(0.014)	(0.020)
Creativity	0.037	0.028	0.058
	(0.029)	(0.037)	(0.048)
Teamwork	-0.048	-0.068	-0.041
	(0.044)	(0.068)	(0.061)
Constant	0.246***	0.172***	0.311***
	(0.045)	(0.059)	(0.070)
Team Effects?	Yes	Yes	Yes
R ² within	0.002	0.0797	0.0482
R ² between	0.8541	0.6474	0.6762
R ² overall	0.317	0.4743	0.2331
Number of observations	144	77	77
Number of organizations	32	32	32

Table 5. Results of regressions with performance as dependent variable.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

One potential solution to this problem is direct surveying of organizational members. There is some precedent for this in NCAA athletics (Dirks, 2000). Another approach is a case study employing direct observation and interviewing, which should enable a greater understanding of the processes at work and the true level of the entrepreneurial logic constructs in the organization. Both of these carry with them access challenges, and the case study method will necessarily limit the number of organizations that can be compared. Another approach would be to use gameplay measures to observe the results of the entrepreneurial logic construct. While this enables the analysis of a large dataset, it brings with it the challenge of finding valid measures of attitudinal constructs using the available gameplay statistics. This would be challenging.

Opportunities for future research

In addition to the potential effects of the dimensions of entrepreneurial logic on each other, the relationship between entrepreneurial logic and performance should be investigated. Action in the face of uncertainty, whether it arises from employee mobility (Campbell, Saxton, & Banerjee, 2013), attempting to do something the organization has never done before, or other reasons, presents a variety of challenges, particularly for an established organization (e.g., Dachner, Saxton, Noe, & Keeton, 2013). Existing resources, such as routines, human capital, policies and procedures, and other artifacts are of questionable utility, and the investments made in them are at risk of becoming worthless or even counterproductive. Previously negotiated agreements as to distribution of residual claims may no longer make sense (Alvarez & Barney, 2005). The capabilities that drive performance in an uncertain environment are likely to be different than those

that are effective where performance is lower. While this is true, the nature of those capabilities has received little attention.

Future work should address that gap in the literature, by positing three capabilities (trust, creativity, and management of team production processes) that, to the extent that they are present in the organization, increase performance in the face of uncertainty. Since the presence of uncertainty requires individuals within the organization to go forward without a full ability to perceive the motives for each other's actions or the implications thereof, trust is essential. Creativity enables the organization to draw connections between perceived facts and develop the information that drives performance. Finally, the management of team production processes is essential to organization in the absence of information necessary to make rational judgments about participation. Since organizational actors cannot be motivated by relative certainty about rewards, they must find some other reason to participate; effective teamwork can give them that reason.

CHAPTER 3: RESETTING THE SHOT CLOCK: THE EFFECT OF CO-MOBILITY ON HUMAN CAPITAL²

“If you read any of the papers in Los Angeles or listen to any sports talk radio or scan through the dozens of purple-and-gold blogs, you’d believe there must be some master solution that will make all the Lakers’ disparate parts cohere into some unstoppable basketball force. Once Dwight learns to play with Pau, everything will be fine. Or once Nash learns to play alongside Kobe, the team will stop looking slow and confused on offense. Or once the bench players find their roles, the second unit will look like something more than five random dudes who happen to be standing on a basketball court together.” -- Jay Kaspian Kang (2012), journalist at ESPN, referring to the disappointing start to the Lakers 2012 season after trading for new players.

Strategic human capital research on employee mobility has highlighted that the movement of human capital across firm boundaries facilitates the ability of an organization to transfer resources (Rao & Drazin, 2002) or learn (Song, Almeida, & Wu, 2003). In exploring this phenomenon, the extant literature attributes changes in organization-level performance to mechanisms that occur at the individual level such as the flow of human capital (Agarwal, Ganco, & Ziedonis, 2009; Campbell, Ganco, Franco, & Agarwal, 2012; Maliranta, Mohnen, & Rouvinen, 2009), social capital (Agarwal, Campbell, Franco, & Ganco, 2012; Somaya, Williamson, & Lorinkova, 2008), and routines (Aime, Johnson, Ridge, & Hill, 2010; Phillips, 2002) that are embedded in people. However, the proposed micro-level mechanisms drive organizational outcomes

² This chapter is joint work with Benjamin A. Campbell and Preeta M. Banerjee. A version of this chapter is forthcoming in the *Journal of Management*.

through their effects on individual outcomes (Abell, Felin, & Foss, 2008; Coleman, 1990), yet the effects of employee mobility on the knowledge, skills and abilities of individuals are generally under-theorized and under-explored in the strategic human capital literature.

Accordingly, we explore the consequences of employee mobility on individual skills and abilities through the twin lenses of human capital theory and social capital theory. In so doing, we argue that some components of human capital are location-specific and some are colleague-specific, and as such, these components drive different effects of mobility on the skills and abilities of individual movers and incumbents. As individuals acquire experience within an organization they develop firm-specific human capital, some portion of which may be specific to the location and some portion of which is specific to the set of colleagues within that organization with whom they work (i.e., the component of social capital that is embedded in an employee's relationships with colleagues). If employees change employers, they "reset the clock" on individual experience (Amburgey, Kelly, & Barnett, 1993; Huckman, Staats, & Upton, 2009). A change in organization and a change in the set of colleagues disrupts the location-specific and colleague-specific components of their human capital and restarts the process of building new skills and relationships. Similarly, if employees are joined by new colleagues through in-bound mobility events, they preserve the value of their firm-specific human capital, but their collection of colleague-specific capital is disrupted and must be rebuilt to accommodate relationships with their new colleagues.

Empirically, we explore the impact of location change and personnel change on individual human capital by examining players within the National Basketball Association, a context marked by high levels of interdependency between employees where colleague-specific capital is likely to be highly valuable, and where it is common for several employees with previously existing relationships to change organizations together. In line with the quote at the start of the paper which suggests that organizational performance after a mobility event was adversely affected because players did not know how to play with each other and instead looked like “five random dudes who happen to be standing on a basketball court together” (Kang, 2012), we demonstrate that employee mobility has a temporary adverse impact on human capital of moving employees consistent with the loss of location-specific and colleague-specific human capital as captured by a decrease in individual performance. Additionally, we show that moving players experience a loss of human capital that is moderated if they move with previous colleagues and thus can maintain the value of some colleague-specific human capital. Contrary to our hypotheses, we do not find that the human capital of incumbent players is significantly affected by in-bound mobility events.

This paper makes three main contributions. First, we formalize and test micro-level effects that have been posited in previous research (e.g., Aime et al., 2010; Campbell, Ganco, et al., 2012; Wezel, Cattani, & Pennings, 2006) to drive organization-level impacts of employee mobility. While we do not directly hypothesize or test links between mobility and organizational performance, this formalization provides a stronger foundation for the understanding of one possible way in which employee mobility affects

organization performance -- its effect on different aspects of individual human capital. We do not explicitly theorize or test cross-level mechanisms; our objective is to offer an exploration of the underlying micro-mechanisms. Related to this, we expand the construct of context-specific human capital (Ployhart & Moliterno, 2011) by demonstrating a type of context-specific human capital (previously-formed colleague-specific capital) that is not location-specific (i.e. it can be transported across, and disrupted within, organizational boundaries) and impacts the performance of both those who have it and others in the organization that interact with those who possess it. Second, by examining the differential impact of employee mobility on the performance of movers and incumbents, we contribute to a deeper understanding of a series of results (Groysberg, Lee, & Nanda, 2008; Huckman & Pisano, 2006) highlighting the potentially contrasting effects of location-specific human capital and colleague-specific capital on post-mobility performance of organizations. Our framework provides a theoretical explanation of these prior results and identifies how the devaluation and subsequent construction of different aspects of human capital after employee mobility events plays a central role in the evolution of knowledge, skills and abilities as employees construct their careers across organizations. This conceptualization calls into question traditional measures of firm-specific human capital, such as firm tenure, which confound location-specific and colleague-specific human capital. Third, we extend a series of results on the impact of team composition changes on team performance (Huckman et al., 2009; Reagans, Argote, & Brooks, 2005). We demonstrate that changes in team composition “reset the clock” on the process through which employee experiences generate both

location-specific and colleague-specific human capital. Specifically, we demonstrate the patterns through which different aspects of existing human capital are devalued and subsequently developed after different types of mobility events.

THEORETICAL FRAMEWORK

Brief Literature Review

We propose that employee mobility leads to the disruption of both location-specific and colleague-specific human capital. We operationalize human capital in line with Becker (1964), who describes human capital as resulting from “activities that influence future monetary and psychic income by increasing the resources in people” (1964: 11). This definition includes both those investments and characteristics that produce resources that apply across organizations and situations, and those that are more narrowly tailored to a specific context. It includes knowledge, skills, abilities, and other characteristics (KSAOs) that are specific to a particular occupation (such as the rules of basketball, in our context, or case law for an attorney) or apply to a broad variety of occupations (such as facility with written English or leadership techniques). It also includes KSAOs that are specific to a particular firm. We argue that the traditional conceptualization of firm-specific human capital can be classified into KSAOs which do not depend on a particular group of co-workers to create value (termed location-specific human capital) and those that do depend on co-workers to create value (termed colleague-specific human capital) which is a type of social capital.

While social capital is a broad term used to cover a variety of concepts from “the linkages among individuals or groups within the collectivity and, specifically, in those

features that give the collectivity cohesiveness and thereby facilitate the pursuit of collective goals” (Adler & Kwon, 2002: 21) to “an individual’s personal network and elite institutional affiliations” (Belliveau, O’Reilly, & Wade, 1996: 1572), we follow Burt (1997) and focus on the particular conceptualization of social capital that is embedded in dyads of individuals and represents complementarities between individuals. Under this treatment of social capital, social capital is defined by its effects, not by its form (Coleman, 1990): it may include such disparate aspects as networks, trust, common social norms (Putnam, 2000), and more generally any social structure that enables people to work together (Fukuyama, 1996). We consider this aspect of social capital to be a component of human capital, in that it is embedded in a specific individual and captures the ability of that focal individual to work productively with specific colleagues. In other words, we conceptualize colleague-specific human capital as an individual’s KSAOs related to the identification and operationalization of opportunities for complementarities with specific colleagues.

The extant literature on the role of individual mobility on organizational performance highlights the ways in which employee mobility introduces valuable human capital (and their embedded know-how and skills) into target organizations (Campbell, Ganco, et al., 2012; Carnahan, Agarwal, & Campbell, 2012; Franco & Filson, 2006; Rao & Drazin, 2002; Wezel et al., 2006) and removes it from source organizations (Agarwal et al., 2012; Campbell, Ganco, et al., 2012; Wezel et al., 2006); introduces new *types* of human capital into target organizations that facilitate expansion of the breadth of an organization (Rosenkopf & Almeida, 2003; Song et al., 2003); transfers social capital

with clients (i.e. client-specific human capital) into target organizations to enhance client relationships (Somaya et al., 2008); transfers social capital with external organizations into target organizations to help shape institutions and policy outcomes (Dokko & Rosenkopf, 2010); facilitates knowledge flow back to source firms by enhancing social networks between organizations (Corredoira & Rosenkopf, 2010); and facilitates the dissemination of routines to target firms (Aime et al., 2010; Phillips, 2002).

These rich relationships contribute to the strategic human capital literature by highlighting mechanisms through which employee mobility can alter organizational outcomes. However, these effects of employee mobility represent mechanisms that occur through individuals, yet there is little research exploring the impacts of these proposed mechanisms on individuals. Huckman and Pisano (2006) highlight the role of firm-specific human capital on individual performance after employee mobility by demonstrating a performance reduction among surgeons when operating at new hospitals, even when performing the same procedures. Similarly, Groysberg et al. (2008) show that star employees' performance tends to decline when changing from one firm to another even in contexts where firms appear very similar. Furthermore, the study found that when moving along with at least one other employee, no performance reduction was observed in the employee which suggests that colleague-specific human capital is an important predictors for post-mobility performance. Dokko, Wilk and Rothbard (2009) extend the analysis of the transfer of human capital into new organizations and demonstrate that while task-relevant human capital positively affects performance in a new organization, other experiences adversely impacts individual performance. On the

colleague-specific capital side of the coin, Castilla (2005) demonstrates that the individual performance of workers who join an organization through a referral is adversely impacted when their referrer leaves the organization suggesting the importance of social capital within an organization on individual performance. Note, however, that in these studies the effects of location-specific and colleague-specific human capital, as we have defined them here, are often commingled (c.f. Castilla, 2005; Groysberg et al., 2008). This is to say, they do not draw a distinction between the loss of location-specific human capital associated with changing organizations, and the losses associated with leaving behind old co-workers and joining new ones.

Given the dearth of studies examining the micro-level underpinnings of the relationships between employee mobility and organizational performance, the theoretical understanding of how mobility affects organizational performance is under examined. We explore one mechanism through which organizational performance is affected by employee mobility by highlighting how and when employee mobility affects individual knowledge, skills and abilities. Further, we argue that there are two distinct categories of individuals that are affected by employee mobility: the movers themselves and the incumbents in the organizations in which they join. This distinction allows us to compare the effects of changing locations and of changing colleagues. Specifically, we explore how employee mobility affects the location-specific human capital and the colleague-specific human capital of both types of workers.

Location-Specific Human Capital, Colleague-Specific Human Capital and Employee Mobility

Becker (1964) conceptualizes human capital as an aggregation of skills that have different loci of relevance; in other words, the human capital of an individual can be partitioned according to its relevance in other settings. Becker (1964) goes on to characterize human capital as either general human capital that is valued in many other organizations or firm-specific human capital that is valued only in one organization. While we focus on the human capital possessed by individuals, organizational human capital is a seminal resource of organizations, including knowledge organizations (Starbuck, 1992); technology and innovation organizations (Collins & Smith, 22:30:03); and organizations in fast moving, turbulent environments (Fine, 1999). Human capital within an organization captures the interdependent and embedded nature of employees and employers as it is a “a unit-level resource that is created from the emergence of individuals’ knowledge, skills, abilities, and other characteristics (KSAOs)” (Ployhart & Moliterno, 2011: 128). Organization level measures of human capital are positively related to organizational performance (Hitt, Bierman, Shimizu, & Kochhar, 2001; Kor & Leblebici, 2005) and the knowledge, skills and abilities that support individual human capital are associated with positive outcomes for individuals (Mincer, 1974; Topel, 1991). Firm-specific human capital is particularly relevant in the strategic context because firms and workers share the rents associated with firm-specific human capital (Coff, 1997) and thus it can support competitive advantage if it can be effectively isolated (Campbell, Coff, & Kryscynski, 2012); Chadwick, 2013).

In competitive labor markets, when an employee changes jobs, the difference in productivity across the two jobs may be attributed to the change in value of the underlying aspects of the individual's human capital. For example, when employees who possess firm-specific human capital change jobs, their performance is expected to initially decrease because while the general component of their human capital has equivalent use value in their new organization, their investments in firm-specific human capital in previous organizations are no longer valuable to them. As a result, in the short term, the individual loses the value of their firm-specific human capital. This logic is drawn upon by Groysberg et al (2008) and Huckman and Pisano (2006) to explain their findings *ex post* on the role of mobility on the individual performance of moving employees and developed explicitly by Dokko, Wilk and Rothbard (2009). However, after the initial dip, the process of building new human capital that is specific to their new employer begins. As a consequence, when workers who have valuable firm-specific human capital change employers, there should be an initial dip in outcomes followed by a long-term recovery (Campbell, 2013; Carnahan et al., 2012). The size of the initial dip is shaped by the use value of the employee's firm-specific human capital in the employee's prior job and the rate of recovery is driven by the ability of the employee to acquire new firm-specific human capital and the use value of firm-specific human capital in the employee's post-mobility job.

While the component of firm-specific human capital that is truly location-specific cannot be transferred across locations, mobile employees may be able to transfer some of their colleague-specific human capital if they move with previous colleagues. Similarly,

incumbents retain the value of their location-specific human capital, but lose the value of colleague-specific human capital that had been formed with departed colleagues and must develop new relationships with new colleagues. Since we conceptualize colleague-specific human capital as an individual's KSAOs related to the identification and operationalization opportunities for complementarities with specific colleagues, when an employee possesses colleague-specific human capital her performance will be greater when co-working with that specific colleague than in his or her absence. These complementarities, which might be driven by trust, shared routines, artifacts of common work such as improvised technology, or other receptacles of tacit knowledge serve to reduce coordination costs between actors: they facilitate the ability of multiple actors to recognize and implement more productive ways to work together. In contexts where work processes are interdependent, the private and public good aspects of social capital (Coleman, 1988; Leana & van Buren, 1999) should be complementary within organizations; which is to say, increased social capital broadly, and colleague-specific capital more narrowly should lead to improved performance by both individuals and organizations.

Empirical studies have borne out this connection – social capital has been found to improve both the performance of organizations wherein it exists (e.g., Coleman, 1990) and career outcomes of the individuals involved in the relationships where it is embedded (e.g., Burt, 1997; Useem & Karabel, 1986). Work on the benefits of social capital within organizations (Leana & van Buren, 1999; Nahapiet & Ghoshal, 1998) has emphasized the benefits to coordination that it confers on the individuals that possess it. Nahapiet and

Ghosal (1998) focus on the role of social capital in the development of new knowledge within the firm, which, at the collective level, they refer to as intellectual capital. They argue that the presence of relationships among firm members and the accompanying social capital facilitates combination and exchange processes that lead to the development of new knowledge.

This conceptualization suggests that mobility events adversely affect both the location-specific and colleague-specific aspects of human capital of movers and adversely affects the colleague-specific human capital of incumbents. Mobility events might be more or less disruptive of human capital depending on the status of the employee and the relative extent to which location- and colleague-specific human capital is disrupted in a given individual, but all the possible effects of a mobility event on human capital are negative. As a result, we hypothesize:

H1a: Employee mobility has an adverse effect on the human capital of the employees joining the organization.

H1b: In-bound employee mobility has an adverse effect on the human capital of incumbent employees within the organization.

Colleague-Specific Capital and Group Mobility Events

Because addition of a new employee into an organization disrupts the set of colleagues of the mobile employee, his or her ability to coordinate actions with others in the new firm is compromised, the employee's store of tacit knowledge is devalued, and their complementarities with co-workers are eroded. However, if a mobile employee enters an organization with others with whom they have shared experience and have

developed colleague-specific human capital, then the ability to coordinate with colleagues is partially transferable and the value of tacit knowledge and the associated complementarities with co-workers are less devalued.

The benefits gained by the new employees when they move along with others with whom they share experience should have a negative effect on the performance of incumbents in the new organization. Since social capital serves to aid in coordination among individuals (Coleman, 1988) the greater the disruption to such knowledge, the lower the performance of incumbents until new relationships develop in response to the new additions. In line with this reasoning, the magnitude of the disruption of colleague-specific capital of incumbents will be greater when the mobility event is a team event: there is a decreased efficacy of the existing ability to coordinate as the size of the mobility group and the percentage of employees that do not share the same knowledge increases. The regularity and predictability of actions the group previously depended on will no longer be present; the coordination that had been facilitated by the relationships will require a greater cognitive effort (Cyert & March, 1963). As a result, simultaneous actions will be harder to undertake and performance will be reduced.

In summary, employees who change organizations cannot transfer the location-specific aspects of their human capital and can only transfer the colleague-specific capital that they have developed with any co-movers (if they move as part of a group). If movers do move as part of a group, they are able to transfer some of their existing colleague-specific capital so the adverse impact on their individual performance is moderated.

On the other hand, incumbents who are impacted by an in-bound mobility event do not change firms, so, by definition, their location-specific human capital is not impacted. However, replacing co-workers disrupts the set of colleague-specific capital of incumbents. As new employees replace co-workers with whom they have developed social capital, their ability to identify and operationalize opportunities with all their colleagues is disrupted and the larger the change in colleagues, the greater the impact on performance of incumbents. This logic is summarized in Table 6. Because group mobility events affect the extant colleague-specific capital of movers and incumbents differently we hypothesize the following:

H2a: The adverse effect of employee mobility on the human capital of moving individuals is moderated by whether movers move as part of a team, such that the effect is stronger for solo movers than those who move as part of a team.

H2b: The adverse effect of employee mobility on the human capital of incumbent individuals is moderated by whether or not they are joined by an in-bound mobility team, such that the effect is weaker for those joined by solo movers than those joined by a team.

	Moving Employees	Incumbent Employees
Solo Mobility Event	<ul style="list-style-type: none"> • Large disruption of location-specific human capital • Larger disruption of colleague-specific capital (relative to movers in a group) 	<ul style="list-style-type: none"> • No disruption of location-specific human capital • Smaller disruption of colleague-specific capital (relative to incumbents joined by a group)
Group Mobility Event	<ul style="list-style-type: none"> • Large disruption of location-specific human capital • Smaller disruption of colleague-specific capital (relative to solo movers) 	<ul style="list-style-type: none"> • No disruption of location-specific human capital • Larger disruption of colleague-specific capital (relative to incumbents joined by a solo mover)

Table 6. Impact of mobility events on firm-specific and colleague-specific human capital

Group Mobility Events and Performance Recovery

Given that colleague-specific capital is created and accumulated within the context of a particular relationship, investments in this aspect of human capital can only be made once the focal relationship starts, and accumulates as exchanges take place (Lawler & Yoon, 1998). As a consequence, colleague-specific capital takes time to form. Given the limitations on the ways in which social capital is beneficial outside of the relationship in which it was formed, changes in the personnel associated with a particular organization (either additions or subtractions of personnel) will necessarily devalue investments in relationships that were previously made. This is obvious in the case of subtractions from a team, but can also be true when new members are added. To the extent that the addition of new organizational members disrupts the context in which previous colleague-specific capital was developed, those investments may not continue to produce value for those who made them. To add to this point, it should be noted that

while theorists differ on the effects of network structure and hierarchical relations on social capital, (e.g., Burt, 1997; Coleman, 1990), those effects are included in almost all models. It is widely believed that changes in network structure will have some implications for social capital and consequently for colleague-specific human capital.

Combining the logics that colleague-specific capital takes time to build and that moving with a team moderates the human capital reduction of movers also suggests that movers in a group should recover faster from that reduction except when movers are assigned to different tasks (Dokko et al., 2009). Since there is less adjustment required due to the previously developed relationships, less time should be required to restore performance to its previous level. The better coordination that exists among subgroup members should give those individuals a head start on building new human capital. Having to develop colleague-specific capital with fewer actors should speed the process; the relationships that need to be established should be simpler and more easily developed.

Moving with a team should affect incumbents in the temporal dimension in addition to causing a larger performance reduction. Within a group mobility event, each incumbent member must develop complementarities with more than one actor. More experience will be required to develop tacit knowledge, because the number of actors with whom shared experience will be needed is increased where the incoming group is larger. It will take time for incumbents to develop expertise both with the new team members individually and the group of them (in the case where they have previous experience as a group); each incumbent will have to adjust his or her performance to account for the new relationships that will be introduced into the group. As a result:

H3a: The rate of human capital recovery is greater for movers who move as part of a group relative to solo movers.

H3b: The rate of human capital recovery is smaller for incumbents exposed to an in-bound group mobility event relative to a solo in-bound mobility team.

DATA AND METHODOLOGY

Empirical Context

As the opening quote highlights, the on-court dynamics of the National Basketball Association (NBA) are marked by highly interdependent teams where individual performance is affected by the skills of the individual as well as individuals' familiarity with their teammates. The interdependencies rely critically on players knowing the abilities and tendencies of their teammates. Part of understanding the tendencies of teammates involves developing social capital that allows players to operate productively together in dynamic and uncertain environments. The addition of new personnel disrupts the existing coordination as coaches and incumbent players learn how to best work with a new teammate. During this learning period, when new relationships are being developed, the performance of affected individuals is adversely impacted.

The context of professional sports organizations has been frequently used to study organizational phenomena (Aime et al., 2010; Berman, Down, & Hill, 2002; Wright, Smart, & McMahan, 1995) and the NBA is an ideal context in which to study the accumulation of colleague-specific human capital for several reasons. First, the game of basketball features a high degree of interdependence among players (Berman et al., 2002). For example, players depend on each other to pass the ball in places and times that

enable them to score. Players must position themselves correctly relative to each other, with and without the ball, on both offense and defense. At the professional level in particular, correct timing is critical; a teammate's action coming a half-second too slowly or too quickly may prevent a play from working. The interpersonal action necessary to make all these actions happen is precisely what colleague-specific human capital facilitates. Second, available data on individual performance in professional basketball are more reliable than that available in other settings. Third, while the rules of basketball have shifted in interpretation over the study period, this effect is gradual and should not affect the relationship between individual performance and mobility events in our study, because individual performance is compared from before and after each individual mobility event.

The study examines data from the NBA for all player-game dyads from 2000-2009 to demonstrate the effects of employee mobility across organizations on individual human capital over time. In this context, it is fairly common for employees to move in groups from one organization to another and be expected to integrate their skills with that of their teammates in a short period of time under intense competitive pressure in a zero-sum environment. One important advantage of this context is the availability of detailed individual performance data; these data allows the performance of mobile players and incumbent players to be measured before and after mobility events. In this context, we use weighted shooting percentage as a reflective indicator of the human capital of the individual. Reflective indicators represent the effects of the construct. In this context, salary, all-star-votes, points, assists, etc., are all reflective of the player's underlying

human capital. In a reflective construct, the use of one item is valid as long as it reflects the construct. Omission of alternative reflective indicators does not affect the interpretation of the results because the items are interchangeable due to the underlying inter-item correlations (Nunnally & Bernstein, 1994)

Even with these strengths, this setting carries with it a generalizability concern; a basketball team is a small, relatively cohesive unit with a degree of interdependence that is perhaps higher than teams in other contexts.

Data Source

The data for this study are collected by Sports Reference, LLC and represent data aggregated from NBA game logs for all players that appeared in any game between 2000 and 2009. The raw game logs capture a variety of individual performance measures for every player and every game over the course of the season. The raw data includes measures such as minutes played, points scored, rebounds, and assists, as well as date of the game and the organization for which the individual plays. These last two variables allow us to construct measures of employee mobility across organizations. Because we know the employing organization for each individual at all points in time over the ten years, we can reconstruct each individual's career which allows the identification of all mobility events. Further, we can identify mobility events where a group of individuals transfer from one organization to another by identifying all individuals that move from one organization to the same subsequent organization within a ten game window.

Estimation Strategy

We compare and contrast the effects of disruptions in location-specific and colleague-specific human capital after mobility events. These post-mobility dynamics provide insight on the evolution of different aspects of individuals' human capital after shocks. We operationalize our estimations by using variations on the following model of individual human capital:

$$y_{it} = \alpha_1 M_{it} + \alpha_2 T_{it} + \alpha_3 G_{it} + \alpha_4 M_{it} * G_{it} + \alpha_5 X_{it} + \alpha_6 X_i + \alpha_7 X_{ft} + \alpha_8 X_f + c + \varepsilon_{it}$$

where i indexes individual, t indexes time (we assume that mobility events occur between time periods 0 and 1), y_{it} is a measure of individual i 's performance at time t which we treat as a proxy for human capital, M_{it} indicates whether the focal individual experienced a mobility event in the prior 20 games, T_{it} indicates whether the mobility event was a group mobility event (i.e. did multiple people move in unison to a new organization?) G_{it} measures the number of games since the most recent mobility event that affected individual i . Finally, X_{it} are time-variant individual controls that control for roles and usage of every individual within their organization. Our primary parameters of interest are α_1 , α_2 , α_3 , and α_4 which provide estimates of how the human capital of an individual is shifted when experiencing a mobility event, how whether the mobility event is part of a team moderates that shift, how individual performance evolves over time after mobility events, and how team mobility events moderate that evolution.

We adapt this specification to explore two empirical relationships. First, we examine how mobility and group mobility differ in their impact on human capital of moving players relative to non-moving players. Second, we examine how in-bound

mobility and group mobility differ in their impact on human capital of incumbent players relative to incumbent players who did not experience an in-bound mobility event. In our empirical strategy, we are concerned that unobserved characteristics of the organization and of the individual may bias the results. For example, if an organization is systematically better at integrating new human capital or an individual is systematically better at building different aspects of capital, then the empirical results will be biased. To address this concern, we include individual- and organization-level fixed effects (as well as year fixed effects) which allows us to estimate how *changes* in individual human capital are related to characteristics of mobility events and games since the occurrence of mobility events while controlling for *changes* in individual and organization characteristics. We estimate a series of specifications of our base model on both organization and individual level outcomes.

In our analysis, we exclude mobility events that occur between seasons. When a mobility event occurs between seasons, the new players and incumbent players have a long period in which to practice together; to share interdependent co-experiences; and ultimately to develop location-specific and colleague-specific capital outside the context of observed games. Although these events represent the majority of mobility events, we must exclude them because we cannot accurately measure the evolution of individual's human capital.

Variables

Weighted Shooting Percentage. The primary dependent variable for all the hypotheses is constructed as the following:

$$\text{WeightedShootingPercentage} = \frac{\text{PointsScored} - \text{FreeThrowsMade}}{2 * \text{FieldGoalsAttempted}}$$

This measure captures the efficiency of a player on the offensive end of the court. A player with a high value on this metric has a high expected value of points scored for each field goal attempted. This measure is independent of the pace of the employing organization and is also independent of the efficiency of other teammates within the organization. We assume that this measure captures the ability of an individual within an organization to attempt his personal high-percentage field goals. In the interdependent and complex context of an NBA offense, the ability for a player to take high percentage shots is affected by the skills of the focal individual, but also by how well the focal player knows the strengths, weaknesses, and preferences of his teammates within that system; this ability also requires that the other players on their team know *his* strengths, weaknesses, and preferences. In other words, *weighted shooting percentage* is affected by the tacit knowledge and coordination of an individual within an organization. As a result, this measure is a proxy for the aggregate skills and abilities an individual has within the focal context and is our primary measure of human capital.

Descriptive statistics and correlations of all variables are available in Table 1. As shown in the table, the mean of *weighted shooting percentage* is 45%. In other words, across all games and all players in the NBA from 2000-2009, the expected value of every field goal attempt was $(0.45 * 2)$ or 0.90 points.

Mobility. A key measure in the specifications is an indicator of employee mobility. This measure takes a value of 1 for every game in which the individual plays for a team other than the one with which he started the season and averages more than 8

minutes a game in their first ten games after changing organizations. The measure takes a value of 0 otherwise. The restriction on minutes played excludes added players who did not play meaningful minutes with the new organization. Overall, this measure allows us to capture the average impact of employee mobility on individual performance relative to his performance before the mobility event within a season. The data contain 340 mobility events that meet the criteria of a mid-season mobility event. This measure captures the disruption of location- and colleague-specific human capital.

Moved with a Group. For every mobility event captured above, we measure the total number of players involved in the same transition. In other words, we count the number of people who left the same source organization in the middle of the season, joined the same receiving organization within ten games of the focal individual's entrance, and averaged more than 8 minutes a game in their first ten games after moving organizations. Since we only observe players who actually appear in a game, if a coach chooses not to use all new players for the first time in the same game (which is fairly common in the data), we would incorrectly identify them as part of different mobility events – even though they have shared experiences. We allow group mobility events to occur within a 10 game window to more accurately identify the events of interest: people who shared experiences in one setting bringing their human capital to a new setting. Injuries could be driving longer observed gaps between players' first appearances; however, this approach should provide conservative tests of our hypotheses. Of the 340 mobility events, 41 are group mobility events: 30 two-person events, 10 three-person events, and 1 four-person event (Raef LaFrentz, Nick van Exel, Avery Johnson, and

Tariq Abdul-Wahad were traded together from Denver to Dallas in exchange for three players on February 21, 2002). This measure captures the extent to which colleague-specific human capital is disrupted.

Games Since Mobility Event. For every mobility event, we identify the first game in which a player in that mobility team appeared at the receiving organization. We use this game as a reference point and, for every game in which a mobile individual appears after changing organizations, we calculate the number of games played since changing organizations.

Controls. In the individual-level models, we control for time variant and time invariant individual characteristics. In order to control for individual differences in experience we control for games played in the NBA. To capture team experience in a given year we control for the game in the year. Additionally, in all individual specifications we include an individual fixed effect to control for time-invariant characteristics of the individual as well as year and firm fixed effects. We control for player usage with controls for minutes played, assists, steals, and total rebounds. In the organization-level models we control for the salary of the players who played in the game to account for differences in quality of rosters. We also control for opponent's winning percentage at the start of the game to account for differences in opponent quality. In the organization-level models we also include year and firm fixed effects. Means and correlations of all individual-level variables are available in Table 7. Table 8 presents summary statistics of individual players conditional on mobility.

		Mean	S.D.	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12	v13	v14	v15	v16
v1	Mobility Event	0.04	0.19	1.000															
v2	Mobility Event X Moved with a Group	0.01	0.11	0.574	1.000														
v3	Log(Games Since Mobility Event)	0.10	0.53	0.937	0.559	1.000													
v4	Log(Games Since Mobility Event) X Moved with a Group	0.03	0.32	0.541	0.943	0.594	1.000												
v5	Log(# of Games Experience)	4.96	1.12	0.102	0.059	0.103	0.060	1.000											
v6	Log(Game in Year)	3.43	0.92	0.137	0.077	0.139	0.079	0.167	1.000										
v7	Shared Experience of Mobility Team (Games)	1.21	13.05	0.467	0.814	0.470	0.792	0.061	0.061	1.000									
v8	Weighted Shooting Percentage	0.45	0.26	-0.008	-0.002	-0.004	-0.002	0.042	0.021	0.002	1.000								
v9	True Shooting %	0.51	0.24	-0.009	-0.002	-0.006	-0.002	0.041	0.019	0.002	0.918	1.000							
v10	Player Efficiency Rating	15.44	15.14	-0.010	0.003	-0.007	0.003	0.066	0.027	0.004	0.653	0.707	1.000						
v11	Points	10.18	8.14	-0.019	0.008	-0.011	0.009	0.157	0.018	0.016	0.410	0.440	0.629	1.000					
v12	Assists	2.26	2.55	-0.002	0.005	0.002	0.005	0.121	0.020	0.014	0.057	0.067	0.263	0.374	1.000				
v13	Rebounds	4.38	3.56	-0.024	0.014	-0.020	0.014	0.097	0.001	0.012	0.100	0.104	0.307	0.391	0.069	1.000			
v14	Steals	0.79	1.03	-0.005	0.004	-0.001	0.004	0.049	0.003	0.006	0.065	0.072	0.270	0.286	0.287	0.123	1.000		
v15	Minutes Played	25.08	11.35	-0.020	0.018	-0.009	0.019	0.194	0.018	0.028	0.181	0.191	0.308	0.730	0.495	0.521	0.355	1.000	
v16	Blocks	0.51	0.96	-0.025	0.004	-0.025	0.003	0.021	-0.012	0.001	0.063	0.060	0.186	0.134	-0.058	0.376	0.024	0.203	1.000

Table 7. Summary statistics of individual-level variables

	Mean	S.D.
Mobility Event	1.00	0.00
Mobility Event X Moved with a Group	0.33	0.47
Log(Games Since Mobility Event)	2.54	0.95
Log(Games Since Mobility Event) X Moved with a Group	0.88	1.36
Log(# of Games Experience)	5.52	0.76
Log(Game in Year)	4.06	0.32
Shared Experience of Mobility Team (Games)	31.25	58.74
Weighted Shooting Percentage	0.44	0.26

N = 8804

Table 8. Summary statistics of individual-level variables – conditional on mobility

RESULTS

Figures 1 and 2 depict the weighted shooting percentage of individuals after experiencing a solo mobility event or a group mobility event for movers and incumbents respectively. In Figure 1, the lower line depicts the performance trajectory of a solo mover that joins a new team; the upper line depicts the performance of movers who move as part of a group. The initial performance shock is much smaller for players who move with a group, and the time to recovery to pre-mobility performance is much faster for players who move with a group. In these raw results, individual performance of solo movers are shown to recover to pre-mobility levels about 18 games after joining a new

team, while movers in a group are consistently back to their pre-mobility performance levels after about 9 games. Figure 2 depicts the performance of incumbents in the organization after new colleagues join their organization. The upper line represents individual performance of incumbents after a solo mobility event and the lower line represents the performance of incumbents after being joined by multiple players on the same team. In-bound mobility events that consist of one person have very little effect on incumbents, while in-bound group mobility events demonstrate an adverse effect on the performance of incumbents. Together, the two figures suggest that there is a trade-off inherent in group mobility events: the larger the size of the group mobility event, the smaller the impact on the performance of the movers, but the larger the impact on the performance of the incumbents, and vice versa.

Figure 1. Weighted shooting percentage of movers after mobility events.

Figure 2. Weighted shooting percentage of Incumbents after mobility events

The figures suggest the validity of hypotheses 1, 2, and 3 but do not control for any underlying differences in players and teams. We provide more rigorous tests of the hypotheses in Table 9. Table 9 contains our results for the impact of employee mobility on the individual performance of both movers and incumbents. Model 1 of Table 9 contains the estimates for the tests of the impact of mobility on the individual performance of movers. Model 2 includes group mobility as a moderator. These models test hypotheses 1a, 2a, and 3a on the role of mobility team size on the performance of moving individuals, and their rate of recovery after moves. Models 3 and 4 present the

same relationships for incumbents that are joined by new teammates, testing hypotheses 1b, 2b, and 3b. In Model 1, we demonstrate that mobility events have a significant adverse impact on individual performance which supports hypothesis 1a. Model 2 includes group mobility as a moderator. Group mobility has a significant positive impact on post-mobility individual performance after controlling for the overall impact of mobility, supporting hypothesis 2a. In other words, the performance of players after group mobility events is less adversely affected than players who are part of solo moves. Similarly, the interaction of games since mobility event and group mobility events possesses the opposite sign of the direct effect of games since mobility events. This suggests that the recovery rate for group movers is slower on a per-game basis than solo movers – however, this result may be driven by the fact that group performance has a less adverse shift from which to recover. This result does not support hypothesis 3a.

Models 3 and 4 present the same analysis focused on the individual performance of incumbents in organizations. We do not find a strong direct effect of in-bound mobility on incumbent performance. In Model 3 we find that exposure to a mobility event (i.e. being joined by a new teammate or teammates) does not have a significant adverse impact on incumbent performance but we find that incumbent performance improves with each game after the mobility event. Model 4 includes group mobility as a moderator. These results do not indicate significant direct effects on incumbents. The positive sign on games since mobility event and the marginally significant negative sign on the interaction of games since mobility events and joined by a group suggests that when exposed to a group mobility event, incumbents' game-to-game improvement is

disrupted – but we cannot assess the validity of H3b since there is no performance dip from which incumbents can recover.

DV: Weighted Shooting Percentage	Movers (Tests of H1a, H2a, H3a)		Incumbents (Tests of H1b, H2b, H3b)	
	(1)	(2)	(3)	(4)
Mobility Event (H1)	-0.01362+ (0.00782)	-0.02271* (0.00937)	-0.00226 (0.00220)	-0.00117 (0.00240)
Mobility Event X moved with a group (H2)		0.02833+ (0.01696)		0.00029 (0.00615)
Games since Mobility Event	0.00388 (0.00287)	0.00805* (0.00349)	0.00204* (0.00083)	0.00246** (0.00088)
Games since Mobility Event X moved with a group (H3)		-0.01242* (0.00612)		-0.00398+ (0.00241)
# of games experience	-0.00094 (0.00121)	-0.00093 (0.00121)	-0.00086 (0.00121)	-0.00093 (0.00121)
Constant	0.32337*** (0.00582)	0.32310*** (0.00582)	0.32392*** (0.00582)	0.32318*** (0.00583)
Individual Role Controls?	Yes	Yes	Yes	Yes
Year Effects?	Yes	Yes	Yes	Yes
Team Effects?	Yes	Yes	Yes	Yes
R ² within	0.014	0.014	0.014	0.014
R ² between	0.301	0.301	0.302	0.302
R ² overall	0.028	0.028	0.028	0.028
Number of observations	226962	226962	226962	226962
Number of players	1000	1000	1000	1000

Table 9. The effect of mobility events on weighted shooting percentage.

+ p<0.10

* p<0.05

** p<.01

*** p<.001

Models are panel regressions with individual fixed effects.

Individual Role Controls include minutes played, assists, steals, blocks, and total rebounds

While the absolute sizes of the effects for movers are small, in context they are important. *Weighted Shooting Percentage* has a mean value of 45%; the immediate effect of mobility on a solo mover is a decline of about 2.3%. Relative to the mean, these effects are small and they disappear quickly; however, they do represent a change that is about 8.8% of a standard deviation in the measure. While these results are admittedly small, they are indicative of the underlying relationship connecting colleague-specific human capital to individual performance. These players have spent much of their lives playing on many teams and with many players, thus this is a context where players are potentially very good at adapting to new teammates and quickly generating new, relevant colleague-specific human capital. As such, this context is biased towards not finding any results at all, despite being a context where interdependence and coordination matters. In other contexts, where the coordination goes deeper and employees are less experienced in adapting to new personnel, we anticipate that the results would be much stronger and the tradeoff between group mobility and solo mobility even more salient.

Additional Analysis and Robustness Checks

We find mixed support for our prediction that the adverse consequences of employee mobility on human capital increase with the magnitude of the disruption to colleagues. A potential concern is that our results may be driven by endogeneity of player mobility. Two mechanisms through which endogeneity may impact the results are that (a) organizations may only add players who they believe will adapt quickly to the organization's incumbents, and (b) teams with low coordination of existing players may

be more likely to alter their workforce in an attempt to establish new, higher-value coordination.

The first concern suggests that our results are conservative tests of the impact of colleague-specific capital disruption on individual performance within organizations. The second concern suggests that high-performing teams and low-performing teams add players for different reasons and thus might exhibit different effects. To address this concern, we performed a subsample analysis of all of our models in which we divided the universe into players on teams with winning records at the time of the mobility event and players on teams with losing records at the time of the mobility event. In unreported results, we find that moving with other players has a dramatically more positive effect on movers' individual performance in losing organizations than in winning organizations. For incumbents, the results are weak and do not suggest strong differences in the impact of mobility on incumbents across winning and losing organizations. These results weakly suggest that low-performing organizations may have low-value relationships and movers that import existing relationships into these organizations have higher individual performance relative to solo movers.

Another concern with the validity of the results is that the importance of colleague-specific human capital may differ according to the roles played by the individuals. To address these concerns, we examined the robustness of the results to different roles played by the individuals as measured by minutes played. In another set of unreported results, we present baseline results from subsample analyses using different restrictions on the number of minutes played. In the baseline results, we constrained our

universe to players that average at least eight minutes a game since this cut-off focuses on the results of meaningful contributors to the team. However, we expect that the results will differ for starters and for players that see very little court time. The addition of a rarely utilized player, for example, is not expected to affect the performance of players who are often on the court. In this robustness test we test the sensitivity of the results to using no restriction on minutes played and focusing only on players that average more than 24 minutes per game, where starters average 28 minutes a game (Gonzalez et al., 2013). We find that for movers, starters are not significantly different from the full sample. For incumbents, we also do not find significant differences across the two subsamples.

There are several potential concerns with our measure of weighted shooting percentage as the primary dependent variable. First, there is heterogeneity in players' abilities. While shooting percentage captures how well their offensive decisions reflect their coordination with their colleagues, we include individual fixed effects so that the results represent change in shooting percentage within an individual. Second, there is heterogeneity in players' objectives. For example, some players are defensive specialists, some players are rebounders. As such, offensive coordination with their colleagues may not be their primary objective, thus we explore the baseline results using a variety of different aspects of human capital, including true shooting percentage (a ratio-based measure that adjusts shooting percentage to account for the likelihood of shooting and making free throws), player efficiency rating (a composite measure capturing a player's performance on a variety of metrics, such as points scored, assists, steals, rebounds, etc.,

relative to the rest of the league), points scored, assists, total rebounds, steals, minutes played and defensive rating (a composite measure capturing the quantified aspects of individual defense, such as defensive rebounds, steals, etc.). Third, our primary dependent variable is a ratio which potentially leads to biased results (Wiseman, 2009). We follow Wiseman's suggestion and residualize the ratio of interest by regressing the numerator on the denominator and using the residual as the dependent variable. The results of these alternative specifications are presented in Table 10. The top panel of Table 10 contains the results on movers and the bottom panel contains the results on incumbents. We find that the baseline results for movers are fairly robust to choice of dependent variable while the group mobility moderator is more fragile to alternative dependent variables. The alternative results for incumbents are noisier. The weakness of these results suggests that impact on incumbents is small and perhaps not economically significant. However, a potential confounding factor in these alternative results is that mobility events impact the minutes played by a player. While the models include minutes played as a control where relevant, if there is a non-linear relationship between minutes played and the dependent variable, the results could be biased. Because of this, efficiency-based measures such as weighted shooting percentage and true shooting percentage which are independent of minutes played are cleaner measures of the focal aspects of human capital.

Movers DV:	True Shooting Percentage	Player Efficiency Rating	Points	Assists	Total Rebounds	Steals	Minutes Played	Residualized Shooting Percentage
Mobility Event (H1)	-0.02012* (0.00893)	-0.31254 (0.52883)	-0.14388 (0.21124)	0.13376* (0.06574)	0.29689** (0.09704)	0.01419 (0.03492)	-1.80035*** (0.27431)	-0.37664** (0.14018)
Mobility Event X moved with a group (H2)	0.02616 (0.01593)	1.27735 (0.95635)	0.91214* (0.38237)	0.18821 (0.11901)	0.22839 (0.17565)	0.02031 (0.06320)	2.43092*** (0.49685)	0.28099 (0.25390)
Games since Mobility Event	0.00681* (0.00332)	0.05695 (0.19716)	0.01143 (0.07877)	-0.04429+ (0.02452)	-0.09104* (0.03619)	-0.00144 (0.01302)	0.56033*** (0.10232)	0.13360* (0.05229)
Games since Mobility Event X moved with a group (H3)	-0.01136* (0.00574)	-0.42013 (0.34497)	-0.27892* (0.13792)	-0.06477 (0.04292)	-0.06181 (0.06336)	-0.00531 (0.02280)	-0.69580*** (0.17922)	-0.14011 (0.09159)

Models are the same specification as Model (2) in Table 9.

Incumbents DV:	True Shooting Percentage	Player Efficiency Rating	Points	Assists	Total Rebounds	Steals	Minutes Played	Residualized Shooting Percentage
Mobility Event (H1)	-0.00120 (0.00223)	0.08562 (0.13513)	-0.04690 (0.05401)	-0.00238 (0.01681)	-0.01800 (0.02481)	0.00413 (0.00893)	-0.24694*** (0.07019)	-0.04120 (0.03587)
Mobility Event X moved with a group (H2)	0.00401 (0.00574)	0.21132 (0.34700)	-0.08127 (0.13875)	-0.07694+ (0.04318)	0.05672 (0.06374)	0.03488 (0.02293)	-0.21458 (0.18030)	0.05307 (0.09214)
Games since Mobility Event	0.00193* (0.00082)	0.06846 (0.04983)	0.04032* (0.01992)	0.01356* (0.00620)	0.01935* (0.00915)	0.00025 (0.00329)	0.12151*** (0.02588)	0.02319+ (0.01323)
Games since Mobility Event X moved with a group (H3)	-0.00430+ (0.00224)	-0.28762* (0.13567)	-0.03305 (0.05425)	0.01852 (0.01688)	-0.04155+ (0.02492)	-0.00143 (0.00897)	0.19185** (0.07050)	-0.06620+ (0.03603)

Models are the same specification as Model (4) in Table 9.

Table 10. Robustness tests: The effect of mobility event size on alternative measures of individual skills.

+ p<0.10

* p<0.05

** p<.01

*** p<.001

DISCUSSION AND CONCLUSION

When employees change organizations, they take their human capital with them. Some of their human capital is valuable in the new location, and some is not (as in the familiar distinction between general and specific human capital). While specific human capital has been generally understood to mean *firm*-specific human capital, this is not necessarily the case. For example, some previously formed aspects of social capital may be valuable in the new setting (particularly if the employee moves as part of a group) and some aspects of social capital (formed with people the individual is no longer working with) is devalued even for people who do not change firms. Put another way, the value of human capital is sensitive to changes in both location and personnel. Changes in personnel can occur within the same organization and changes in organization do not necessarily imply a wholesale change in personnel. Using this logic, this study examines the micro-level mechanisms that underpin a series of results in the strategic human capital literature connecting employee mobility to organizational performance. Building on the work of Groysberg et al. (2008) and Huckman and Pisano (2006) who demonstrate that taking workers out of their existing context and inserting them in a new context has adverse consequences on individual performance, we examine the effect of mobility on individual human capital. As summarized in Table 1, we argue that moving employees experience a larger disruption to their firm specific human capital than incumbents and that group mobility events drive a smaller disruption in colleague-specific capital for movers than for incumbents.

We examined the implications of this logic using data from the National Basketball Association which is a context marked by highly interdependent actors where there is a premium on cooperation between actors. Although these properties create a challenging environment in which to integrate new players, it is not uncommon to observe groups of players moving from one team to another during the season. Our empirical strategy was to compare the effects of solo and group mobility events on individual performance to explore how human capital disruptions after mobility events for both movers and incumbents are shaped by the disruptability of location-specific and colleague-specific human capital. We found support for our hypotheses that at the individual level, mobility adversely impacts the performance of movers, suggesting that both location disruptions and personnel disruptions impact human capital. Further, the results demonstrate that moving with a team of colleagues diminishes the adverse performance consequences of movers, providing evidence of the importance of colleague-specific capital for movers. These results are consistent with our logic that human capital disruptions of mobile employees are driven by both the firm-specificity of employees' human capital and the disruption of colleague-specific human capital that employees share with their co-workers, both of which are rebuilt over time. We do not find robust results for the impact of in-bound mobility on incumbents, thus we cannot make any claims on the validity of the hypotheses pertaining to incumbents.

While our study contributes to the existing literature on the human capital impacts of employee mobility, there are some important limitations and boundary conditions. An important limitation of this project is our use of proxies for human capital. We are

unable to measure exactly what knowledge, skills, and abilities individuals have, nor exactly what relationships two employees have and how much shared knowledge is embodied in the dyad. As such, we proxy for these specific attributes with measures of individual performance and employees' experiences on teams and with colleagues. Future research that more deeply delves into the exact nature of the multiple aspects of human capital could provide deeper insights into this phenomenon.

Additionally, future work should investigate how both individual- and firm-level moderators affect the relationship between employee mobility and individual and organizational performance. Individuals may differ in their ability to generate different aspects of human capital. This differential ability may be related to past education and past work experiences. Similarly, organizations may differ in their capabilities to “fit new pieces” into the organization. In our results, we have not reported the firm effects, however many firm effects are significant and they vary in sign. This suggests that some organizations can integrate new players better than other organizations. The organizational-level factors that drive this heterogeneity are very interesting, but beyond the scope of this paper. Future research exploring such factors would help identify how firms may learn from its competitors more efficiently.

Another limitation that provides an opportunity for future complementary research in a different context is the inability to examine the effect of in-bound mobility of multiple players who come from different organizations within this context. Given the nature of trading in the NBA, it is rare that multiple players from different sources join a team together. As a consequence, our results on the effects of group mobility on

both movers and incumbents represent only players with shared experiences. Examining in-bound mobility of players coming from multiple teams would facilitate further teasing out the role of colleague-specific capital. Groups of employees who join an organization with shared experiences may be easier to assimilate than groups of independent employees because the incumbents only have to adapt to one new set of processes as opposed to adapting to multiple sets of processes and backgrounds. On the other hand, groups of in-bound employees with shared experience may be harder to assimilate if the movers' shared colleague-specific human capital hinders their ability and willingness to adapt to the new organization.

Another limitation of our study, which we also believe represents an excellent opportunity for further research, is our inability to test psychological mechanisms for our results. There is a wide literature on co-worker effects on individual performance (e.g., Chiaburu & Harrison, 2008), findings from which could explain our results. In addition, work in the area of person-organization fit (Kristof-Brown, Zimmerman, & Johnson, 2005) might also shed insight into our findings.

As previously noted, professional sports have important advantages for studying organizational phenomena as compared with other settings. However, they raise generalizability concerns. Performance in the National Basketball Association is completed in public: patterns may differ where organizations know less about each other's performance and about the capabilities of individual employees. In addition, the game of basketball is highly interdependent; colleague-specific human capital will possibly be less important where interdependence is lower, thus attenuating the effects

we found. Further work in other industries will help us understand the phenomena more completely.

Another limiting factor in this setting is the nature of the transfers between organizations. In this setting, management is able to transfer human capital involuntarily, which is not possible in most other industries. Team management makes these changes for particular reasons, often (but not always) to improve their club. Because teams that are trading differ from those who are not, our results may be biased. While this is a concern, it is ameliorated by the fact that under the salary cap (which was in effect for our entire study period), teams trade for multiple reasons. For instance, it is not uncommon for teams to trade for players and cut them immediately to save on salary expenses (a fact we accounted for in our methodology). Teams often trade valuable assets in an effort to save money; they are not necessarily trying to immediately improve the on-court performance of the organization. Additionally, the trades identified in the data are often symmetric where teams exchange players with similar market value. This finding suggests that the population of trading teams is not necessarily systematically different than the population of NBA teams as a whole. With that said, further research should investigate the varying effects of different human capital strategies on performance.

Contributions

In addressing the impact of employee mobility on individual performance, we contribute to several literatures. First, we contribute to the discussion in the strategic human capital literature that is re-examining the over-emphasis on firm specificity as an isolating mechanism that supports human capital-based competitive advantages. In line

with previous research that challenges the received understanding of firm-specific human capital by arguing that there are very clear boundary conditions on when firm-specificity can prevent mobility (Campbell, Coff, et al., 2012) and that investments in firm specific human capital co-create general human capital so that workers can appropriate the value of firm-specific investments by threatening mobility (Morris, Alvarez, Barney, & Molloy, 2013), we highlight that traditional measures of firm specificity, such as firm tenure, might confound location-specific capital and colleague-specific capital, where colleague-specific human capital can be transferred outside the physical boundaries of an organization. As such, we call for more careful measures of firm-specificity that better capture human capital that is not transferrable to other organizations.

We also contribute to the literature that explores the role of employee mobility on organizational performance. This literature argues that individual mechanisms drive the connection between employee mobility and organizational performance, but does not explore whether their proposed mechanisms are actually reflected in individual outcomes. We provide a deeper understanding of two series of results suggesting that personnel and contextual (Groysberg et al., 2008; Huckman & Pisano, 2006) factors are important in understanding the performance of organizations after mobility events. We develop a framework that provides a theoretical explanation of the prior results and identify how disruption and emergence of different aspects of human capital through employee mobility plays a central role in determining individual human capital after employee mobility events and thus in determining organizational performance after employee mobility events.

Our findings also provide a more detailed empirical understanding of the role of mobility on human capital. By examining how individual performance evolves over time following mobility events, we illustrate that the magnitude of a shock to human capital affects the length of time it takes for the employees to recover to pre-shock levels. This finding suggests that organizations should be thoughtful when making workforce, organizational, or technological changes that disrupt the relationships embedded in the workforce because to recovery from the disruption may take time (although the effects are quite transitory in the context under study).

This work suggests important implications for managers in contexts where individual performance is highly sensitive to context and personnel. When adjusting the composition of their workforce, managers face a key trade-off. Mobility of individuals as part of a group has positive effects on the human capital of incumbents, while in-bound mobility of a group has a potentially negative effect on the human capital of incumbents. At the same time, the human capital of individual movers is more adversely impacted than the performance of group movers. While the disruptions to individual human capital may be temporary and quite short-lived, if immediate individual performance is an important objective then managers must be very careful before integrating multiple people at the same time. Managers, given their specific conditions and short-term and long-term objectives, must choose how best to adjust their workforce with the knowledge that hiring a large group or multiple independent individuals will have short-term adverse consequences on individual performance.

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