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## Investigating the principal's psycho-mental approach and the impact of his mentality cogitation in encouragement reward of administration in principal-learner relations at schools

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### ABSTRACT

*Learner-oriented theory is one of the most important foundational theories in administration research, but it rests on tenuous cognitive uncertainties. We combine classical learner-oriented theory with a realistic theory of the intrinsically imperfect human potential for interpersonal sense-making. This allows us to systematically show how the principal's ability to cogitate with the learner influences value creation in principal-learner relations, and to link this to organizational sense-making instruments.*

**Key words:** principal, cogitation, learner-oriented theory, administration

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### INTRODUCTION

Learner-oriented theory (Gibbons, 2008; Grossman and Hart, 1998; Hamilton, 2006; Jensen and Marker, 1976; Larry and Martin, 2012; Prendergast, 1999) is one of the most important foundational theories in administration research (see Eric, 2009; Hendry, 2012). Learner-oriented theory has found numerous applications in various streams of administration research (Merchant, Voss and Zhang, 2007), such as motivation administration (Stroh, Brett, B.Auntie and Reilly, 1996), accounting (Annie and Demon, 1988; Lambert, 2001), organization theory (Abrahamson and Park, 2004; Zenger, 2004), and corporate governance and strategy (Amy and Lev, 1999; Brush, Brown and Henry, 2011; Cuff, 1997). The theory provides fundamental insight into the roles of contracting, monitoring, organizational arrangements, and the motivations embodied there in.

Learner-oriented theory and its many applications are based on several simplifying uncertainties (Lauren, Lane, Collin and Very, 2006). In this paper, we specifically focus on the uncertainties regarding the knowledge that individuals have of each other and how they process that knowledge. In order to precisely identify and discuss these issues, we take our point of departure in the core, typically mathematical, statements of the theory (e.g., Hamilton, 2006, 1982; Grossman and Hart, 1998; Larry and Martin, 2012) rather than in interpretations of learner-oriented theory found in the administration literature (e.g., Eric, 2009). The theory's formal core statements highlight the clear, albeit strong and contentious, nature of knowledge and logic uncertainties in learner-oriented theory. For instance, in analyses of moral hazard, the principal is assumed to perfectly know the learner's taste for risk (Ross,

1973; Hamilton, 2006). The source of such knowledge is the principal's ability to comprehend key characteristics of what is in the learner's mind. When principals engage in such perception, they "cogitate" (Singer and Fehr, 2008).

To theoretically approach and build up the cogitation construct, we draw on new, converging insights from evolutionary anthropology (Call and Thompsons, 2008), neuroscience (Gallagher and Fred, 2007), neuro-economics (Singer and Fehr, 2008), and research on perspective-taking in psychology (Galaxy, Mandarin, Gilbert and White, 2008). In line with this research, we define cogitation as an individual's comprehension of another individual's intentions, knowledge, and beliefs. The relevancy of the cogitation concept has been evidenced in both theoretical and empirical research. Such research indicates that cogitation is a meaningful construct that is usually imperfect, that—absent specific neurological pathologies—it varies on a continuous scale that ranges from inaccurate to (imperfectly) accurate, and that it is asymmetrically distributed across individuals.

It also suggests that cogitation processes can be deliberate or non-deliberate (i.e., automatic), and that they can be influenced by context and experience. Our unique and specific contributions consist of the introduction of this construct (the general human capacity to cogitate) into the context of learner-oriented theory, and an exploration of the value-creating implications of doing so.

In learner-oriented theory, the principal's knowledge with respect to much (but not all) of what is "inside the head" of the learner is assumed to be perfect. Coupled with other uncertainties (such as those regarding risk preferences and the timing of the game), this assumption allows for clean predictions regarding how motivations will drive the behavior of such actors as employees, administrators, and suppliers (Prendergast, 1999). However, the assumption that a principal is capable of perfectly grasping, for instance, a learner's motivations seem increasingly tenuous. High personnel turnover and the increasing use of fleeting project organization in many industries, as well as the increasing relevancy of cross-national and cross-cultural administration teams and networks, make an assumption of imperfect cogitation on the part of the principal a more adequate analytical starting point.

We examine the consequences of introducing more realistic uncertainties about cogitation for learner-oriented theory and its administration applications. On the one hand, we posit that cogitation is imperfect and that, as a result, real-world principals cannot perfectly cogitate in the manner assumed by learner-oriented theory. On the other hand, we assert that cogitation provides access to "soft psychological information" that is not considered in learner-oriented theory. This information provides cues to the learner's type or effort. We show that novel insights into the design and administration of rewards follow from this information. Specifically, we argue that cogitation is a fundamental and cost-efficient instrument for reducing information asymmetry and raising value creation in the principal-learner setting.

The evidence suggests that motivations are often far from perfectly matched with the learners whose behavior they are meant to regulate, sometimes with detrimental consequences (Baker, Gibbons and Murphy, 2004; Prat, Combs and Gilley, 2006; Zahra, Prat and Rasheed, 2008). One instance was Dan and Braad street practice of only paying bonuses to salespeople when customers bought a huge subscription to the firm's credit account services than they had purchased in the preceding year. This practice led to huge lawsuits based on claims that Dun and Bradstreet salespersons had fraudulently misrepresented the usage of subscriptions to lure customers into buying larger subscriptions (Roberts, 2009). One possible cause may have been imperfect cogitation: principals may not have envisioned that their learners would react in creative, yet clearly nonfunctional, ways to the motivations. In other words, they did not grasp the intentions that the distortion motivations might give rise to. As the instance suggests, the principal's cogitation matters because it influences the motivations he offers to the learner, and how he monitors the learner and otherwise manages the relationship. In turn, such "motivation administration" (Hamilton, 2006, 1999) influences the value that principal and learner jointly create.

In order to comprehend this issue, we must raise and answer the following research questions: How do the design and administration of motivations depend on the principal's cogitation? How does this relation differ from the predictions of learner-oriented theory? We seek to answer these questions by developing the construct of cogitation in the context of the learner-oriented relation. We thus contribute to the comprehension of the cognitive micro-foundations of value creation (see Green Lawrence, 2001).

Most extent critical discussions of learner-oriented theory in economics, and in administration and organization research have focused on the motivational uncertainties of the theory (Fer and Faulk, 2012; Feraro, Prat and Sultton, 2008; Gospel and Moran, 1996; Lauren et al., 2006; Oliver and Frey, 2011; Parrow, 1986). However, very few papers have explicitly dealt with knowledge and logic uncertainties. Papers written by Hendry (2012, 2008) are closest to this paper in terms of concerns regarding the uncertainties of learner-oriented theory. Hendry's papers

significantly extend standardized learner-oriented theory by demonstrating that most of the theory's predictions rely on the structural properties of principal-learner relationships rather than classical uncertainties about opportunistic self-seeking behavior and total competency. However, our focused point differs. Hendry relaxes key uncertainties of learner-oriented theory and then shows that, with only one exception, the predictions produced by the standardized theory remain the same. Although we also relax uncertainties, we generate new predictions about principal-learner relations by placing principal-learner relations with imperfectly cogitative principals in a broader organizational setting.

The remainder of this article is organized as follows. First, we clarify the implicit theory of mind in learner-oriented theory, namely that the principal possesses a perfect cogitation capability in certain key respects, but in other, equally key, respects, the principal possesses little or no cogitation capability. Second, we develop a more realistic conception of cogitation capability. Third, we use this conception to develop propositions about how cogitation capability can increase value creation.

Fourth, we contextualize our reasoning in an organizational setting and discuss how the value-creation consequences of cogitation are influenced by governance mechanisms. We close with a discussion of the implications and limitations of our analysis, and we draw up an agenda for future research on these themes.

#### KNOWLEDGE UNCERTAINTIES IN PRINCIPAL-LEARNER THEORY

##### The Principal-Learner Plan and the Principal's Difficulty

Learner-oriented theory is based on a combination of uncertainties regarding what individuals know, how they cognitively process what they know, and how they are motivated in the context of learner-oriented settings—that is, when one of (for simplicity) two individuals assumes the role of principal and delegates a task to the other individual, the learner. Specifically, learner-oriented models are mathematical representations of the situation in which an informed individual (typically the learner) trades with an uninformed individual (typically the principal) (Larry and Martin, 2012). The issue that the individuals are informed /uninformed about concerns what the learner does (“hidden actions,” motivating models of “moral hazard”) or what “type” he is (“hidden characteristics,” motivating models of “adverse selection”).

The principal's problem stems from a conflict between insurance and motivations (Ross, 1973; Hamilton, 2006). Learner-oriented theory generally assumes that principals are risk neutral, while learners are risk averse. In this context, the risk-neutral principal should bear all of the risk. However, motivation issues complicate the situation. If the learner's action cannot be observed and there is uncertainty, motivations must be considered. Absent uncertainty, the principal could infer from observing the result which action the learner had chosen and reward him accordingly. However, the result is assumed to be influenced by a stochastic variable.

While both principals and learners know how this variable is distributed (and know that the other knows), the principal cannot observe the actual realization of the variable. He merely observes a “noisy signal” of the learner's effort. To motivate the learner, the contract will specify a reward schedule: the learner's payment from the principal is a function of the observable consequences. In general, such a contract will only be second best, as it will not realize the maximum or first-best value creation. The latter is defined as the value creation that would have arisen if the principal had been fully informed and could direct the learner to take the best action. The reason for the second-best nature of most contracts is that they give the learner motivations; this, in turn, exposes the learner to risk. A risk-averse learner will suffer a loss of perceived well-being (“utility”) as a consequence and will demand a risk premium. Learner-oriented loss can thus be measured by the risk premium. Reducing the learner-oriented loss is the same as reducing the risk premium. In turn, one way of increasing the value created in a learner-oriented relation is to reduce the risk premium. This can, for instance, be achieved by obtaining better signals about the learner's function (Hamilton, 2006).

This reduces the motivations that the learner needs and, thus, the learner's perceived risk. Learner-oriented theory basically predicts that value creation cannot be lifted to the first-best level. However, efficient motivation design and administration can approximate that level.

Normally, the principal's problem can be addressed in two ways: by monitoring the learner's actions (observing inputs) or by using outcome-based compensation (motivation pay). By introducing additional information systems (such as accounting) or by extracting extra information about the learner's actions in other ways, it is often possible to improve on learner-oriented relations, even though the additional information may be imperfect (Hamilton, 2006). Applications of learner-oriented theory have typically considered such indicators as accounting returns, stock function, sales growth, market share, and comparative function, whereas psychological information, such as facial

expressions and other aspects of bad language, have not been considered. When the principal has better information about the actions of the learner, he no longer needs to expose the learner to such strong motivations to make him choose the best action. Thus, the learner needs to shoulder less risk and will demand a smaller risk premium. As a result, value creation in the relation increases (i.e., the learner-oriented loss is reduced). However, to maximize value creation, the principal also needs to decide which signals related to the learner's function should be included in function assessment. For instance, is the function of other learners a relevant signal? Can post-effort conversations with the learner offer additional information?

After deciding which measures to apply, the principal needs to decide which measures and motivations should be linked. For instance, a decision needs to be made regarding how strong motivations should be. Certain tasks learners may not be well aligned with strong motivations because the learner's tolerance for motivations depends on his risk aversion, or (going beyond learner-oriented theory) because such motivations can be detrimental to either the learner's intrinsic motivation (Debi and Ryan, 1985) or the special motivation that the learner may associate with working in well-functioning teams (Linda and Foss, 2011). The principal also needs to make decisions on the intensity of monitoring learners. Typically, the stronger the motivations, the stronger monitoring should be. Finally, the principal needs to assess the extent to which multi-tasking occurs. The more the learner needs to multitask, the less likely it is that strong motivations will be used, as "in essence, complex jobs will typically not be evaluated through explicit contracts" (Prender, 1999: 9). (Later, we argue that this implies that "complex jobs" will be evaluated through cogitation.)

Much of learner-oriented theory is about such motivation administration issues, especially: 1) strategic behavior on the part of learners—learners may influence the principal by offering favors or developing friendship ties (Thompson, 1986) or they may manipulate the signals related to their function (Hamilton, 1982); 2) the "rewarding A while hoping for B" (Kerr, 1975) problems that multi-tasking may give rise to (Hamilton and Miller, 2011); and 3) problems of subjective function measurement (Baker et al., 2004; Levin, 2007)—for instance, administrators may shy away from critically distinguishing among employees, or they may not wish to give poor ratings to subordinates whose pay is determined by such ratings (Murphy and Cleveland, 2011).

#### Knowledge Uncertainties in Learner-oriented Theory

Given learner-oriented theory's enormous influence and its contentious uncertainties, a significant amount of literature deals critically with the theory, addressing its motivational uncertainties (Donaldson and Davis, 2011; Oliver and Frey, 2011) and its function consequences (Ferraro et al., 2008; Gospel and Moran, 1996). However, although the cognitive and epistemic uncertainties of the theory are arguably as contentious as the motivational uncertainties, they have been subject to much less discussion, perhaps because they are less visible. These uncertainties concern how individuals process knowledge (cognitive) and what knowledge they have (epistemic) (Goldman, 1978).

*Cognitive uncertain assumptions* . Learner-oriented theory is sometimes interpreted as resting on foundations of bounded logic (e.g., Eric, 2009). In fact, however, learner-oriented theory does not assume bounded logic. Rather, it assumes the "full" or "maximizing" logic characteristic found in mainstream economics, where the principal and the learner can both be modeled as maximizing expected utility (Larry and Martin, 2012; see Hendry, 2012). However, work in behavioral and experimental economics, and in psychology suggests that individuals generally do not possess the cognitive apparatus needed to maximize expected utility (unless decision situations are very simple) (Cameron, 1998; Karman and Trolley, 2011; Simon, 1978).

*Epistemic uncertain assumptions* . Learner-oriented theory makes several far-reaching uncertainties regarding the knowledge held by the principal and the learner. The theory imports the knowledge uncertainties of game theory. One such assumption is that differences in beliefs among individuals can be completely explained by differences in information (Halfman, 2012). Another key knowledge assumption is that individuals are not only (fully) rational in the sense of being capable of maximizing expected utility, but that they also ascribe such logic to others (Holler, 2001). In fact, the ascription of logic takes a specific form. Player A knows that Player B is rational. Conversely, Player B knows that Player A is rational. Furthermore, the mutual knowledge goes on ad infinitum ("A knows that B knows that A knows that B knows ... that X is the case"). This is the assumption of "common knowledge" (Lewis, 1969; Aunty, 1976), an assumption that underlies most modern game theory, including game-theoretical learner-oriented theory.

In learner-oriented theory, a number of the basic ingredients are assumed to be common knowledge in this sense. In the case of a moral hazard situation, such mutual knowledge includes knowledge of those who are involved in the relation, the actions that are available to them, the risk preferences of the learner, the assumption that both the

principal and learner are rational, the learner's opportunity cost, what the task that the principal delegates to the learner entails, and so on. Of course, the knowledge of the principal is not totally congruent with the learner's, as there would not be a learner-oriented problem in such a case. Thus, the principal usually cannot observe the actions the learner chooses and the specific manifestations of uncertainty. Alternatively, he may not know the learner's characteristics (his "type"). However, in all other respects the principal knows perfectly what the learner knows (and vice versa).

#### Problematic Aspects of the Knowledge Uncertainties in Learner-oriented Theory

A strong implication of the above is that a principal can perfectly read the learner's mind with respect to a number of key conditions that influence the principal-learner relation (the learner can also perfectly read the principal's mind with respect to these conditions, but here we focus mainly on the principal; see Hendry, 2012). Undoubtedly, designing and managing motivations often requires considerable learner-specific knowledge. Learner-oriented theory routinely assumes that the principal perfectly knows and comprehends the learner's degree of risk aversion and his opportunity costs. Simultaneously, the principal cannot observe the learner's effort. Therefore, with respect to the learner's effort, the principal's comprehending is extremely imperfect. In real administration practice, the principal can develop knowledge of the learner that will allow him to interpret the various behavioral clues that signal that learner's effort (e.g., is the learner's staring out of the window a signal of moral hazard or intense, productive thinking?). Thus, learner-oriented theory assumes—in a manner that does not seem empirically warranted—that the principal has a perfect theory of some parts of the learner's mind and, at the same time, a highly imperfect comprehending of other parts. To address this issue, in the following we turn towards a more realistic treatment of the principal's knowledge by introducing the concept of cogitation and linking it to learner-oriented theory.

#### COGITATION AND RELATED CONSTRUCTS

##### Putting Oneself in Others' Shoes

The ability to put oneself in another person's shoes has long been recognized as a crucial aspect of social interaction. In particular, this ability serves as a key mechanism for coordinating beliefs and actions. The importance of this ability is evident across the social sciences, including sociology (Shwartz, 1932; Weber, 2006), and economics and game theory (Auntie and Brad, 2005; Fred and Tirgan, 2011). Furthermore, social psychologists and marketing scholars stress that perspective taking plays a significant role in negotiations (Galaxy et al., 2008) and adaptive selling (Dickson, Vandal, Barren, Yoon, Smits and Van Drucker, 2009).

Given bounded logic (Simon, 1955), individuals perceive, comprehend, and make sense of the world in terms of cognitive frames that they "impose on an information environment to give it form and meaning" (Walsh, 2005: 281; see Green Rivers, 2007; Hodson and Healey, 2008; Johnson-Laird, 1998; Wick, Sutcliffe and Obstfeld, 2008). The development of these cognitive frames is linked to specific socio-cultural and environmental contingencies. Thus, although individuals share many cognitive frames or "kinds" as a result of socialization (Berger and Luckman, 1967; Wick, 2005), those frames have important idiosyncratic and person-specific features (see Schütz, 1932), which produce "cognitive distance"—a difference between distinct cognitive schemes (Nevile, 2011; Nevile, Van HaVandal, Duysters, Gilsing and Van Den Oord, 2007; Wuyts, Colombo, Shantanu, and Nevile, 2008). In contrast, in the world of learner-oriented theory there can be no cognitive distance, as its existence is ruled out by the uncertainties of common priors and common knowledge (Auntie, 1976). For real-world principals, however, cognitive distance is a crucially important factor.

##### Defining Cogitation

Recent developments in evolutionary anthropology (Call and Thompsons, 2008), cognitive neuroscience (Gallagher and Fred, 2007), neuro-economics (Singer and Fehr, 2008), and social psychology (Galaxy et al., 2008) highlight the importance of one individual's comprehending of another individual's intentions, knowledge, and beliefs. When an individual makes inferences about such mental states, he "cogitates" (Singer and Fehr, 2008)—he forms conjectures about mental states that are not directly observable but are useful because they can make sense of and predict the behaviors of others. This process is particularly important for individuals' interactions with others (Premack and Woodruff, 1978).

Intentions, knowledge, and beliefs are three distinct ingredients of human psychological—and, in turn, behavioral—functioning. However, a precise representation of this functioning rests on a simultaneous comprehending of these three complementary constituents of cogitation (Call and Thompsons, 2008). A comprehending of intentions—plans of action that is chosen in pursuit of a goal (Bratman, 2009; Dennett, 1987)—represents the foundation of cogitation. In fact, an comprehending of intentions provides the first "interpretive matrix for deciding precisely what it is that someone is doing in the first place" (Thompsons, Carpenter, Call, Behne and Moll 2008: 675).



For instance, suppose that a principal knows that an learner is working several extra hours, and he wants the learner to maintain this extra effort. However, the action of working extra hours may have widely different intentional connotations. An learner may be working extra because he is intrinsically motivated to deliver good function or because he is externally motivated by the potential for a monetary bonus. While giving a monetary reward to the extrinsically motivated learner would be a proper way of encouraging that learner to keep working, giving the same reward to an intrinsically motivated learner would crowd out the motivation and diminish the learner's effort (Frey and Jegen, 2001). An comprehending of the learner's intentions is, therefore, important for the principal.

This conclusion is strengthened by a consideration of the effects of motivations on extrinsic and intrinsic motivation beyond the principal-learner dyad. In a situation with multiple learners, perceptions of injustice may arise if a learner sees other learners getting a reward that he does not receive because the principal infers that he is mainly intrinsically motivated. Thus, the principal's cogitation must also include how the learner compares himself socially and how he reacts to such comparisons.

An individual's intentions are influenced by her knowledge. The contextualization of an individual's intentions relative to a comprehending of her knowledge is the second constituent of cogitation. Contextualizing significantly refines the comprehending of an individual's intentions. In terms of the above instance, if the principal knows that the learner knows that the organization has, for instance, just implemented a reward system, the principal may expect the learner to work harder in order to get a bonus (rather than because the learner has an innate interest in the task).

As beliefs are, by definition, mental, the possibility of comprehending someone's beliefs represents "the pinnacle of mind reading" (Thompsons et al., 2008: 675; see Kaminski, Call and Thompsons, 2008). Moreover, the ability to explain the behavior of an actor based on what that actor believes to be the case remains crucial when the actor's beliefs are wrong. In terms of the instance, the principal believes that the learner is working extra hours because he knows about the recently implemented reward system. Suppose, however, that the principal also knows that the learner is ignorant about the output-based (as opposed to input-based) nature of the reward criterion—in other words, the principal knows that the learner is wrong in thinking that his extra work will automatically result in an increase in his compensation. The principal may or may not decide to let the learner know about the error in his belief.

In sum, the principal's ability to simultaneously discern what an learner wants to do (i.e., his intentions), how he regards the environment in which he operates (i.e., his knowledge), and what he deems probable (i.e., his beliefs and false beliefs about what will happen based on his information) are important parts of cogitation. Cogitation has been shown to form the basis for comprehending how others make sense of their world and, in turn, for cooperative, deceptive, and empathetic behavior (Galinky et al., 2008; Thompsons et al., 2008).

#### The Mechanism of Cogitation

Cogitation is a cognitive mechanism that involves the activation of deliberate and non-deliberate (i.e., automatic) processes. Neuroscience research demonstrates that humans have an innate brain system that is dedicated to cogitation. Specific brain regions are unconsciously and effortlessly activated when people engage in non-deliberate cogitation (i.e., "implicit cogitation," Fred and Fred, 2007). However, cogitation is not an exclusively automatic process. Other brain regions are activated when people deliberately engage in cogitation processes (i.e., "explicit cogitation," Fred and Fred, 2007; see Fred and Fred, 1999; Gallagher and Fred, 2007). Given the mainly intentional and rational stance of classical learner-oriented theory, we take the non-deliberate and innate side of cogitation as a given. In other words, we assume that principals effortlessly and automatically cogitate with learners to a certain extent, and we focus on the intentional and non-automatic side of cogitation.

Since culture is the "webs of significance" (Geertz, 1973: 5) that give sense to the human experiencing of phenomena, cogitation is intimately related to context and, more generally, to the cognitive distance that separates the cogitator from the cogitated. Clearly, the higher the cognitive distance, the harder cogitation will be. For instance, complex collaborative activities involving shared goals and socially coordinated intentions require a high degree of mutual comprehending, which can be furthered by culturally contextualized processes (Thompsons et al., 2008), such as ceremonies (Chew, 2001; Dracker, More and Tracey, 2010). Ceremonies are mechanisms that assist in the construction of shared meaning (Kurdy, 2010; Meyer and Scott, 1998) by influencing how people think and make sense of situations (Van Maanen and Kurdy, 2009). Ceremonies thus support cogitation.

Cogitation may result in simplistic (even wrong) conjectures or in an accurate representation of the contents of someone else's mind. Neuroscience research clearly indicates an individual's placement between the two extreme

positions of being able versus being incapable of cogitation depends on whether one possesses specific, innate neural prerequisites. Consistent with this, the absence of cogitation has been shown to be typical of developmental or acquired disorders such as autism (Baron-Choen, Leslie and Fred, 1985; Fred and Fred, 1999). However, variations along the accuracy dimension (i.e., the continuous scale that ranges from having an inaccurate theory to an accurate theory of the other's mind) are linked to the sophistication of the aforementioned cultural and experiential mechanisms, and to the cognitive distance between cogitator and cogitated.

Moreover, cogitation is not immune to problems of cognitive distortion (Karman and Trolley, 2006). Thus, imperfect cogitation reflects an inability to accurately cogitate, as well as overconfidence on the part of the principal, who may believe he knows things about the learner's mind that he actually does not (see Flynn and Wiltermuth, 2010). To avoid overly complicating the argument, we abstract from the specific ways in which cogitation may be imperfect. In addition, cogitation greatly supports and combines with distinct psychological processes, such as information processing and memory processes. While we focus on cogitation, we also assume that it naturally antecedes and concurs with other psychological processes in triggering the emergence of theories about others' minds.

Cogitation may be understood as a skilled behavior. In general, a skill is a "capability for a smooth sequence of coordinated behavior that is ordinarily effective relative to its objectives given the context in which it normally occurs" (Nelson and Winter, 1982: 73). Thus, cogitation has skill-like qualities in that it is program-like (i.e., cogitation consists of an ordered sequence of cognitive steps); it is built upon a mixture of tacit and explicit knowledge (in fact, rarely is the cogitator completely aware of the mechanisms that engender his having a theory of the other's mind); and it requires the making of a certain number of choices, which vary in terms of the degree of potentiality (e.g., although the decision to cogitate may be intentional, the choice of how to proceed in order to cogitate may be unintentional). Like a skill, and consistent with its context-driven components, cogitation can also be altered by environmental cues.

Finally, it is important to note that all of the aforementioned factors (deliberate and non-deliberate components of cogitation, the importance of context and culture, potential variations in accuracy, and the skill-like nature of the construct) do not imply that accurate cogitation is a remote possibility. On the contrary, convergent research clearly indicates that cogitation is a fundamental driver of human interaction, which suggests that relatively precise degrees of cogitation are, in fact, found in real-world scenarios.

#### Related Constructs

Cogitation overlaps with two constructs that are familiar from the administration research literature: transactional memory and perspective taking. However, cogitation is not fully congruent with these concepts. Transactional memory is the shared division of cognitive labor with respect to the encoding, storing, retrieving, and communicating of knowledge from different but complementary domains (Wegner, 1986; Brandon and Hollingshead, 2004). Over time, members of a group may develop a common comprehending of each other's areas of competence and expertise. Transactional memory is the group's members shared comprehending of "who knows what" in the group (Brandon and Hollingshead, 2004). This type of transactional memory is similar to cogitation in that it involves an comprehending of what others know, but cogitation has a much broader focus. Not only does it refer to the comprehending of others' knowledge but also, more importantly, to the comprehending of their intentions and beliefs (Thompsons et al., 2008).

Perspective taking refers to the consideration and adoption of someone else's psychological viewpoint (Davis, 1998), which activates a process of "self-other merging" (Davis, Conklin, Smith and Luce, 1996: 714). This process rests on the cognitive and emotional levels (Galaxy and Moskowitz, 2001; Galaxy and Ku, 2004). Perspective taking is similar to cogitation, as it relates to the comprehending of what others know, think, imagine, and feel. However, whereas perspective taking has both cognitive and emotional dimensions, cogitation refers exclusively to cognitive theorizing about another individual's mental states.

#### Knowledge Uncertainties in Learner-oriented Theory in Light of the Cogitation Construct

Learner-oriented theory assumes that the principal has perfect access to and knowledge of certain mental states of the learner. Typically, what exactly is included under this wide-ranging knowledge assumption depends on the specific kind of learner-oriented model. For instance, in moral hazard models, the principal perfectly knows the learner's attitudes regarding risk, the actions that the learner thinks of as being available, the learner's perceived opportunity costs and so on. Of course, this is not necessarily intended as a descriptively accurate assumption, but as an assumption that eases mathematical modeling. However, in administrative practice, principals are imperfect cogitators and cogitation is not in unlimited supply. Administrators / principals like econometricians who work

empirically with learner-oriented theory (Salanié, 2007: 462), face much “unobserved heterogeneity” with respect to the actual contents of learners’ minds. In turn, their cogitation capabilities matter with regard to reward design and value creation.

In sum, we argue that to design and manage motivations, a principal needs to build a cognitive map of the learner’s cognitive categories and states. For reasons of mathematical tractability, learner-oriented theory models assume that this is unproblematic, as embodied in the uncertainties of common priors and common knowledge. In contrast, we argue that cogitation is imperfect and that it provides access to information sources that are not considered in learner-oriented theory. In the following, we address the principal’s cogitation as a crucial determinant of motivation design and administration (and, hence, value creation) in the principal-learner relation.

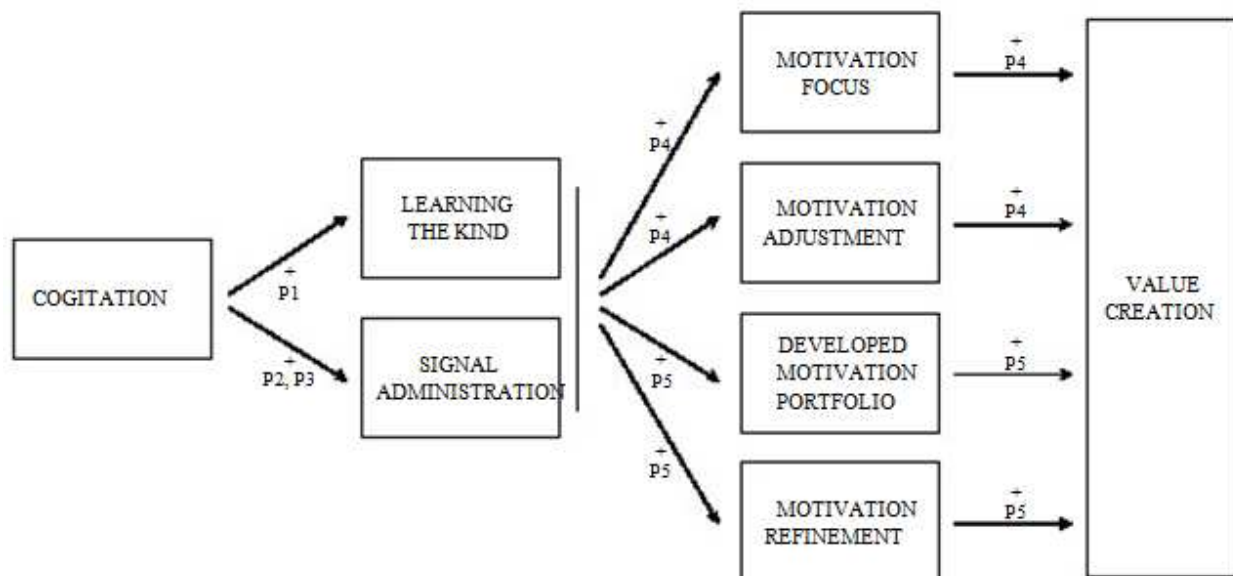
**CONSEQUENCES OF COGITATION IN PRINCIPAL-LEARNER RELATIONS**

**Boundary Conditions and Research Model**

Our theorizing applies to the standardized principal-learner setting of a principal and an learner, and it holds wherever this setting occurs, regardless of the organizational type. To facilitate exposition, we adopt the perspective of the principal in the sense that we address the principal’s cogitation (and black box the learner’s cogitation, see Hendry, 2012). Although cognitive, motivational, and emotional processes are intertwined (Cohen, 2008; Kruglanski, Shah, Friedman, Fish, Chan and Sleeth-Kepler, 2012), we follow recent research in social psychology (e.g., Galaxie et al., 2008) in that we separate these processes. We focus our attention on the cognitive level, and disregard any emphatic, emotional, or motivational processes that may accompany cogitation. Moreover, as we focus on the interrelationship between cogitation capability and value creation, we hold all other determinants of value creation in principal-learner relations (including the learner’s risk preferences, sensitivity to motivations, etc.) constant. We assume that the principal seeks to maximize value creation in the relationship. We do not make any specific uncertainties about whether the principal lets the learner share in any additional value creation.

Figure1 shows how we reason from cogitation capability to value creation.

**FIGURE 1: Cogitation and Value Creation in the Principal-Learner Relation**



**Learning the Learner’s Kind and Managing Signals**

We begin by examining the consistency of the cogitation construct and key learner-oriented theory predictions. Learner-oriented theory shows that decreasing the level of asymmetry of information in the relation between principal and learner increases value creation in the relation. In other words, a better- informed principal can better ascertain a learner’s type, reducing the need for costly signaling.

Moreover, he is better able to infer the learner’s true effort level from the signal on the learner’s effort—the output—and can design his motivations more precisely. This reduces the learner’s perceived risk and the risk premium, thereby increasing value creation.



Cogitation and information asymmetry are distinct constructs. However, cogitation can antecede the degree of information asymmetry in a principal-learner relationship. Specifically, increased cogitation leads to a reduction in information asymmetries. In turn, this increases value creation in the relation because improved cogitation improves the principal's comprehension of the learner's type and the signals related to the learner's actions. For instance, rather than relying on knowledge of the average characteristics of a group of learners, the principal can better ascertain characteristics specific to a certain learner.

There are a number of mechanisms through which the principal's improved cogitation leads to higher value creation. First, the principal can design a contract that better matches the specific learner in terms of striking the right tradeoff between providing the learner with insurance and offering function motivations. Second, a principal who learns the learner's type can better match the learner with specific tasks. For instance, if the learner has a high degree of risk aversion, he may dislike being exposed to an environment in which he has to handle several tasks, as this makes it more difficult for the principal to reliably measure his effort (Hamilton and Miller, 2011). Cogitation is the psychological mechanism that provides the principal with key information about the learner—information that learner-oriented theory assumes the principal already possesses. Thus, cogitation serves as a vital mechanism for comprehending real-world principal-learner relations. It may be that principals can gain such information through, for instance, trial-and-error with different motivations, and infer learner characteristics from such a learning process. However, such processes are costly and lengthy, and cogitation is a lower-cost alternative. This reasoning suggests the following proposition:

**Proposition 1:** Cogitation on the part of the principal is a lower-cost way of getting to know the learner's risk preferences, disutility of effort and sensitivity to motivations. This knowledge increases value creation in the relation.

In addition, cogitation can provide access to soft psychological information that is not considered in learner-oriented theory. For instance, cogitation may provide insight into the learner's self-concept orientation whether the learner thinks of himself mainly in individualistic, relational, or collective terms (Cooper and Thatcher, 2010). This element matters for motivation design because it influences whether the learner should be offered team, rather than individual, motivations (Linda and Foss, 2011). Because cogitation can provide access to additional information (relative to what is considered in learner-oriented theory), the principal can develop a reward design that better fits the peculiar characteristics of the learner. This increases value creation in the relation, as the learner's perceived risk is reduced, necessitating a smaller risk premium.

Cogitation also creates value because it is geared toward interpreting signals about the learner's effort and trustworthiness (Singer and Fehr, 2008). Signaling helps to reduce information asymmetry between the two parties (Riley, 2001; Spence, 2012). This reduction depends on the reliability of the signal and on the receiver's capability to correctly interpret the signal (Connelly, Ceric, Ireland and Reuters, 2010). Clearly, the ability to distinguish honest signals from false signals—and, in turn, to recognize trustworthy learners—is important for the design of efficient reward systems. Bonus contracts that rely on fairness and trust can, in fact, be more efficient than explicit motivation contracts that are enforced by the courts (Baker et al., 2004; Fehr, Klein, and Schmidt, 2007; Fehr and List, 2004; Fehr and Schmidt, 2004).

However, attributions of dishonesty are often stereotypical and inaccurate (Arvin et al., 2006). This is partially due to game playing on the side of the learner, who may adjust his conduct in social interactions so as to guide the impression that the principal forms of him (Goofy, 2008; Leary and Kowalski, 2008). The principal's ability to accurately detect dishonesty and impression administration on the side of the learner is linked to the principal's ability to recognize and decode subtle (verbal and non-verbal) micro-expressions (Eric and O'Sullivan, 2011). Given his improved comprehension of the learner's mental states, a cogitation principal is clearly better equipped to decode an learner's signals—facial gestures, body language, communication, etc.—as clues to his trustworthiness. Thus, cogitation leads to better comprehension of the information content and the reliability of the diffuse signals on the learner's effort and trustworthiness, and therefore to an improvement in monitoring (see Hamilton, 2006). This means that the principal can better ascertain the learner's true effort level, and, if necessary, influence him to increase this level. Again, principals may be capable of gaining such information by adopting various learning theories or by experimenting with different motivations. However, we submit that cogitation is a lower-cost alternative. Thus:

**Proposition 2:** Cogitation on the part of the principal enables him to interpret subtle clues regarding the learner's effort and trustworthiness at a lower cost, and improves his comprehending of the learner's type and effort relative to what is posited in standardized learner-oriented theory.

Rewards, punishments, and even informal encouragement or criticism are signals themselves. They tell the learner something about the principal, his intentions, and his attitudes (Berkley and Tirgan, 2007). Specifically, a principal's decision to use one reward as opposed to another (or as opposed to not using a formal reward) has been proven to be an extremely strong signal for the learner (Berkley and Tirgan, 2007; and, outside of learner-oriented theory, Ryan and Deci, 2011). Learners' receptiveness to the same signals differs. Motivations may, therefore, have a substantially different impact on various learners. An important issue is for the principal "to comprehend in what cases they [monetary motivations] should be used with caution" (Berkley and Tirgan, 2007: 490). Simply put, the principal needs to comprehend what a given motivation will signal to a given learner. Such an comprehending is derived from the principal's cogitation, part of which originates deliberately. For instance, if the principal is capable of cogitation with the learner, he may comprehend that the learner is intrinsically interested in her task, and he may realize that a monetary reward may signal mistrust and, eventually, crowd out that learner's motivation. In this case, the principal should choose a reward that signals trust or flexibility to the learner. In other words, high cogitation allows the principal to make more sophisticated use of the signaling component of motivations. In particular, he can fine-tune signals to increase the learner's effort. Thus:

Proposition 3: Cogitation on the part of the principal enables him to design motivations so that they convey desired signals to the learner.

The improved ability to interpret clues about the learner's effort and signal to the learner provide a novel source of value creation, as the learner's perceived risk goes down, necessitating a smaller risk premium.

#### Diagnosing Inefficiencies and Adjusting Motivations

We have argued that principals that are skilled in cogitation can learn the type of the learner, interpret signals about the learner's effort, and design motivations so as to convey given signals to the learner ("motivation focus"). However, cogitation principals are also capable of evaluating (ex post) the fit of motivations with the learner. In fact, by simply matching an comprehending of the learner's type with the learner's reactions (i.e., signals) to a given reward, the cogitation principal can evaluate the extent to which that reward actually fit the learner ("motivation adjustment") in a time- and, in turn, cost- efficient way. Thus:

Proposition 4: Cogitation on the part of the principal enables him to diagnose reward inefficiencies at an early stage and to reduce such inefficiencies in a low-cost manner by redesigning rewards.

A principal who can gain additional insight into the characteristics, intentions, and beliefs of the learner by cogitation can also better utilize the motivation instruments at his disposal. For instance, he is better positioned to judge the best combination of fixed and variable pay components in a contract that he offers to the learner and how to use verbal recognition as a complement to (or substitute for) such motivations. Also, cogitation improves monitoring and the sending of signals to the learner, as argued above. Principals with more cogitation capability will benefit more from the use of existing motivation instruments and vice versa. Thus, the relation between cogitation and the principal's extant portfolio of motivation instruments is characterized by complement. (Miller and Roberts, 2005).

Moreover, an improved comprehending of the learner's characteristics and intentions (i.e., his type), and of the signaling potential of motivations increases the principal's motivation to explore new motivations, to build a richer and more refined reward portfolio ("expanded motivation portfolio"), and to adjust existing motivation instruments so that they better fit the learners with whom the principal is cogitation ("motivation refinement"). Thus, with a low level of cogitation, the principal will tend to choose motivations that are "at hand" and that fit the average learner. Cogitation improves the principal's comprehending of the learner's type as well as his interpretation and sending of signals, and allows him to build a richer, more refined motivation portfolio by combining motivations in novel ways and by including new kinds of motivations. We therefore suggest:

Proposition 5: Principals skilled in cogitation will rely less on routine or habitual behaviors when choosing reward mechanisms, and they will exhibit a higher degree of creativity in their rewarding practices.

#### Costly Cogitation

Cogitation on the part of the principal is a source of value in the principal-learner relationship. It is the mechanism through which soft psychological information is included in the principal's assessment of the learner's type and effort, and the signaling in which he engages. In a long-term relation, much cogitation happens as a costless by-product of the main activities in the relation.

However, we treat cogitation as a deliberate mental act. Cogitation requires mental effort (attention, information processing, etc.) that cannot be spent on other activities. Thus, cogitation may have fixed costs. For instance, a principal that is new to the culture of a firm in which he has assumed an administrative role needs to learn about the culture of that firm to ensure that he and the firm's learners share some of the basic premises upon which cogitation is built (Kurdy, 2010). Similarly, establishing a relation with a new learner involves a certain initial investment in cogitation with that learner. For instance, internship programs are used with increasing frequency by firms in order to get to know potential employees before deciding whether to hire them. These fixed costs of cogitation suggest that principals will prefer learners who are similar in type, so that they can spread the fixed costs of cogitation over many learners. There are also variable costs of cogitation. For instance, the principal may invest effort into interpreting a certain signal about the learner's effort.

Optimum cogitation balances these costs against the benefits of cogitation (i.e., the optimum is described by equality between the marginal benefits and the marginal costs of cogitation). Note that there may be other benefits to learning the learner's type and managing signals in addition to those that we have already identified. For instance, persons low in cogitation may experience greater social anxiety in interpersonal contexts. In such cases, an enhancement of cogitation may reduce psychological costs. Overall, cogitation introduces an additional tradeoff in the principal's problem, and entails additional costs and benefits that need to be taken into consideration in comprehending how value is created in principal-learner relations. From a prescriptive point of view, we need to identify: (a) the factors that cause value creation in such relations; (b) the main problems in the realization of these factors; and (c) the main instruments through which these problems can be averted or mitigated. Thus far, we have dealt with cogitation capability as a factor that causes value creation in principal-learner relations and we have noted the costs of cogitation. In the following section, we deal in greater detail with the obstacles, represented as a cognitive distance construct, as well as the distinctly organizational facilitators of cogitation capability.

#### COGITATION AND VALUE CREATION: THE IMPACT OF COGNITIVE DISTANCE AND ORGANIZATIONAL SENSE-MAKING

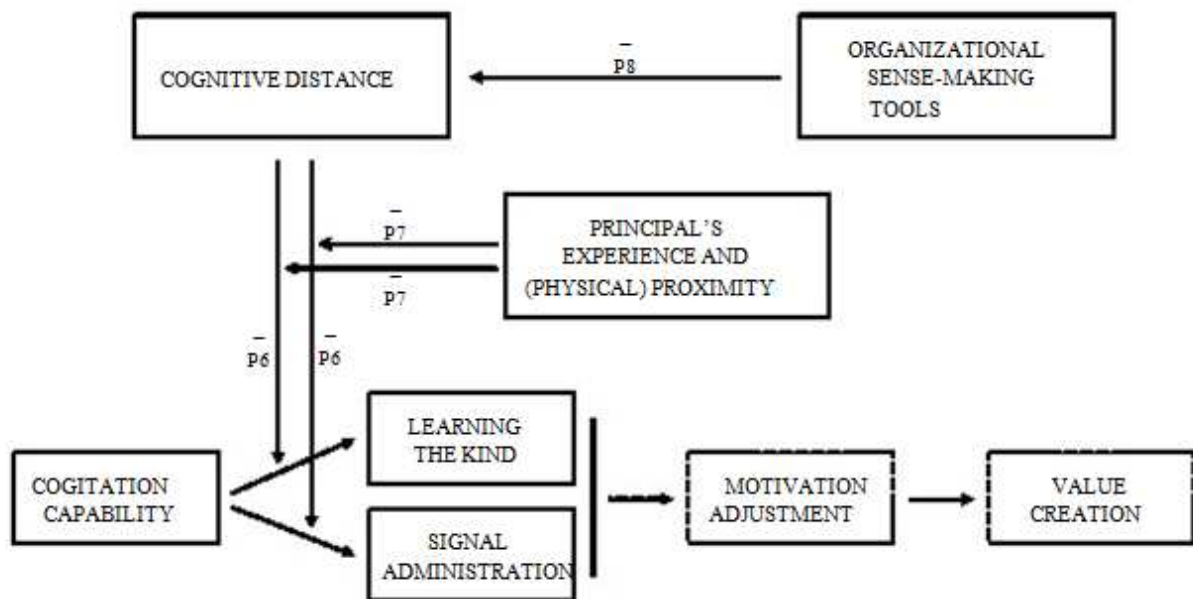
Learner-oriented theory is "institutionally neutral" in the sense that principal-learner relations are not uniquely tied to specific governance structures or institutions. They can exist within as well as between firms (and in numerous other social arenas) (Hart, 2005). However, a significant part of principal-learner relations are embedded within firms (Eric, 2009; Shapiro, 2008).

Much research proceeds from the assumption that learner-oriented problems are endemic in organizations (Hart, 2005; Miller and Roberts, 2010). At the same time, organizations encompass key instruments for handling these problems. Thus, established learner-oriented theory points to rewards coupled with function measurement (Larry and Martin, 2012), tournaments (Laser, 2011), and task design (Hamilton and Miller, 2011) as means to overcome learner-oriented problems. Hendry (2012) stresses the importance of training and instruction. Anderson and Kral (2008) argue that workers' identities can function as important work motivations because they encompass ideals as to how a given job should be done, which significantly reduces principal-learner problems. Linda and Foss (2011) point to a specific kind of social motivation that arises in team situations and argue that firms can succeed in mobilizing such "joint production motivation," keeping learner-oriented problems at bay.

We propose a different view of how organizational instruments can mitigate learner-oriented problems. Our starting point is that cogitation capability is functional to the extent that individuals are cognitively distant. The higher the level of cognitive distance in a relation, the more difficult it is for a principal with a given level of cogitation capability to comprehend the learner's type, actions, signals, and so on. However, cognitive distance is a variable that can be influenced by organizational means.

Figure 2 shows how we introduce cognitive distance and organizational instruments into our framework.

FIGURE 2: Cogitation and Motivations: Organizational Context and Sense-making Instruments



#### Cognitive Distance and Value Creation

By assigning attributes to the learner's intentions, knowledge, and beliefs, the principal tries to comprehend—and eventually look at the world through—the learner's cognitive lens. By definition, the construction of cognitive distance captures variability (Cannon-Bowers, and Salas, 2001; Hodson and Healey, 2008; Nevile, 2011). The principal and the learner may look at the world through completely different (high distance) and quite similar (low distance) cognitive schemes. As sense-making processes are facilitated by familiarity with the focus of attention, cogitation is simpler when cognitive distance is limited. Thus, high cognitive distance between principal and learner has a negative impact on the accuracy of the principal's cogitation. As the principal's cogitation influences value creation through the mechanisms of learning the learner's type and signaling (and the improved use of motivation instruments that this gives rise to, see P1 to P5), cognitive distance indirectly influences value creation. Specifically: Proposition 6: The positive effect of cogitation on value creation in principal-learner relations is negatively moderated by the cognitive distance that separates principal and learner.

#### Experience and Physical Proximity

Cogitation rests on innate and cultural bases. Whereas the former are constant, the principal's experience (Greg and Lawrence, 2011), including his comprehending of a cultural context (Kurdy, 2010), and his physical proximity with the learner (Garry, 2008) are important determinants of the principal's cogitation. Principals base their decisions on evaluations of potential alternatives that can (probabilistically) lead to certain consequences (March, 2004). These evaluations can be driven by experience or cognition. While experiential evaluations depend on actual trials of alternative options, cognitive evaluations depend on mental representations of reality (Green Lawrence, 2001).

Cognitive and experiential evaluative mechanisms are closely interrelated: cognition influences experiential learning, while experience effects cognitive representations (Green Lawrence, 2011; Green Rivers, 2007). Consequently, we expect to see an interaction effect between cognitive distance and physical proximity such that the principal's experience (negatively) moderates the (negative) impact of cognitive distance on the value-creation implications of the principal's cogitation.

In addition, a principal's cogitation depends on his physical positioning relative to the learner. Consistent with the idea that logic is bounded and situated (Simon, 1955; Dearborn and Simon, 1958), there is evidence that important signals of human behavior can be perceived only by direct observation of specific verbal and non-verbal micro-expressions (Eric and O'Sullivan, 2011). This suggests that given a fixed cognitive distance between principal and learner, physical proximity between the parties eases the principal's bridging of that distance. Physical proximity allows the principal to grasp additional aspects of the learner's behavior, which leads to the making of more accurate attributions. Thus, like the principal's experience, physical proximity (negatively) influences the (negative) impact of cognitive distance on the contribution to value creation of cogitation (i.e., P6):

Proposition 7: The negative effect of cognitive distance on the value creation arising from cogitation is negatively moderated by the principal's experience and physical proximity to the learner.

#### The Role of Organizational Sense Making Tools in Connecting Cognitive Distance

Evolutionary anthropologists argue that humans have been equipped by evolution to spontaneously recognize joint endeavors and see themselves as part of such endeavors. This involves definitions of roles and responsibilities, and cognitions about the relevant tasks, interdependencies, timing, and possible obstacles to coordination in the joint endeavor (Thompsons et al., 2008; Higgins and Pittman, 2008). Linda and Foss (2011) argue that organizations need to nurture, mobilize, and sustain these innate, but latent, capacities for coordination if they are to overcome the cognitive distance that is inevitably produced by the organizational division of labor, as well as implications for in-group/out-group dynamics (Brewer, 2011), and organizational roles and their emotional and cognitive correlates. The tension between the organizational division of labor and shared cognition is generally recognized in organization theory, and many researchers emphasize the role of the organization in shaping members' beliefs, and, in effect, reducing cognitive distance (Kogan and Zandie, 1996; Linda and Foss, 2011; Wick, 2005; Wick and Roberts, 1993; Witt, 1998).

Research on organizational identity (Anderson and Kral, 2008; Brewer and Gardner, 1996; Brick, 2008, 2007; Dutton, Roberts and Bed, 2010; Kogan and Zandie, 1996) focuses directly on how the formation of identity is intertwined with cognitive homogenization processes. The sharing of cognition that organizational identity supports may mean that "procedural rules are learned, and coordination and communication are facilitated across individuals and groups of diverse specialized competence" (Kogan and Zandie, 1996: 502). An emerging stream of literature deals with shared cognition in teams (e.g., Muhammed and Dummy, 2001). In this regard, an important goal of effective team design is to assist in the sharing of cognitions (Hirra, Jordan, Field, Giles, and Armstrong, 2006; Prat, Harrison and Muir, 2005). Mathieu and Rapp (2009) argue that clarification regarding individual roles in the team and how roles are interrelated is a particularly important aspect of team design, as are clear function objectives, task coordination, and contingency plans for task execution. De Dreu (2007) shows that the more team members comprehend the interdependencies in the team, the more they engage in helping behaviors and learning, and the higher their productivity.

Apparently, clearly defining and communicating task interdependencies contributes to overcoming cognitive distance because it contributes to task reflexivity, that is, "the extent to which team members overtly reflect upon the group's objectives, strategies, and processes and adapt them to current or anticipated endogenous or environmental circumstances" (West, 1996: 559). This includes more than the sharing of cognitions or mental models (or "reducing information asymmetry"), as successful adaptation at the group level also requires "cross comprehending" (Huber and Lewis, 2010) in which group members comprehend how they differ in terms of knowledge, roles, and so on, and how such differences must be taken into account when adapting to change.

On the organizational level, the sharing of cognitions and even task reflexivity can be supported by multiple means. A clear vision and mission statement that focus on a common purpose and are consensually supported by top administration support the sharing of cognitions (Ashley and Johnson, 2001). The same is true of organizational ceremonies (Drucker, More and Tracey, 2010). Chew (2001) argues that a key purpose of ceremonies is to support the formation of epistemic conditions that approximate the common knowledge conditions of game theory. Thus, organizational members who participate in ceremonies and who know that other organizational members participate know that all participants share the knowledge that was communicated at the ritual. Task reflexivity, which is cognitively more demanding than shared cognition, may be assisted by job rotation and cross-training, as these practices make employees familiar with other functions, roles, activities, and so on, and help them to comprehend how these contribute to firm goals. In summary:

Proposition 8: Organizational identity, transparent team and task design, and the communication of shared beliefs reinforce the value-creation potential of cogitation by reducing the cognitive distance between principals and learners.

While organizations can be designed to reduce cognitive distance between principals and learners, complete elimination of such distance may not be desirable for reasons of variety generation (Walsh, 2005).

## CONCLUSION AND DISCUSSION

We have argued that cogitation is a fundamental determinant of value creation in principal-learner relations. Specifically, we have suggested that cogitation represents one way in which a principal improves his knowledge of the learner's characteristics and efforts, as it allows him to access the kind of soft psychological information that is



not considered in standardized learner-oriented theory. As a result, motivation instruments can be better tailored to learners and principals can be more creative in their use of the motivation instruments that are at hand. Cogitation thus represents a source of value creation in principal-learner relations beyond those considered in learner-oriented theory.

Our analysis proceeded through four different stages. First, we reviewed and problematized (Alverson and Sandberg, 2011) the cognitive and epistemic uncertainties of learner-oriented theory. Second, we conceptualized the cogitation construct. Third, focusing on the context of a simple principal- learner relationship, we showed that the principal's cogitation leads to an improved comprehending of the learner's type and signaling, and in turn to higher value creation in the relation. Finally, we showed that the value creation potential of cogitation is moderated by the cognitive distance that separates principal and learner. We discussed individual- and organization-level factors that can be used to reduce cognitive distance and moderate its impact on the value-creation consequences of cogitation. In this section, we close by discussing our model's contributions, practical implications, and desirable future developments.

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