**Expanding the Concept of Bounded Rationality in TCE:
Implications of Perceptual Uncertainty for Hybrid Governance**

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**ABSTRACT**

Bounded rationality (BR) is a fundamental behavioral assumption in transaction cost economics (TCE). However, critics suggest that the BR assumption in TCE is incomplete, and remains largely compatible with the strict rationality assumption employed in neo-classical economics. In response to these criticisms, Foss (2003) challenges researchers to incorporate a richer notion of bounded rationality in TCE, expanding its implications for efficient governance predictions. We respond to his challenge by integrating cognitive biases in transaction cost economics’ bounded rationality assumption. Using our expanded bounded rationality assumption, we refine TCE’s concept of uncertainty and update the theory’s predictions concerning hybrid governance.

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Herbert Simon defined bounded rationality (BR) as “human behavior [that] is intendedly rational but only limitedly so” (Simon, 1961: xxiv) due to cognitive deficits. He introduced the concept to challenge economists to incorporate more realistic human cognition in their research (Bromiley, 2005). The lack of precision in his definition, however, led to a BR assumption in organizational economics, which does not capture actual decision-making processes (Foss, 2001).

We suggest that there are two types of cognitive bounds on rationality, processing limitations (bounds on the quantity of information processed) and perceptual limitations (restrictions on how the information processed is perceived). However, most BR assumptions in organizational economics only subject actors to processing restrictions, and ignore perceptual bounds. This one-sided view of BR oversimplifies the decision-making process in organizational economics research, thwarting Simon’s original objective.

Transaction cost economics (TCE) (Williamson, 1975, 1985), a major organizational economics theory, assumes that actors are boundedly rational. However, the BR assumption in TCE only incorporates processing limitations, failing to address perceptual challenges and biases. Although Williamson admits that the bounded rationality assumption in TCE does not acknowledge cognitive biases, he believes it still provides a strong foundation for predicting governance choice (Williamson 2000). In contrast, others argue Williamson’s BR assumption is largely a rhetorical device used to invoke incomplete contracts (Foss 2003).

In response to his own and other critiques of the bounded rationality assumption in TCE, Foss (2003) calls for incorporating psychology into the bounded rationality assumption to examine TCE’s predictions under a more realistic decision model. We respond to his call in this paper, and extend the strategy field’s understanding of bounded rationality in three ways. First, we make the distinction between processing and perceptual limitations, which clarifies what is missing from the BR assumption in transaction cost economics and suggests how cognitive and social psychology adds value to TCE research. Second, we propose that a more complex bounded rationality assumption refines transaction cost economics’ uncertainty concept into two distinct types, informational and interpretive uncertainty. Third, we suggest that processing and perceptual limitations create significant transaction costs in exchanges, which substantially revise traditional TCE predictions concerning the impact of uncertainty on hybrid governance.

In this paper, we begin by discussing Simon’s original bounded rationality concept, and Williamson’s BR assumption in transaction cost economics. Next, we examine criticisms of Williamson’s bounded rationality assumption, and suggest they arise as a result of his sole focus on processing limitations, and complete omission of perceptual limitations. We then argue that a more accurate operationalization of the governance decision process is captured if both types of cognitive deficits are taken into account. Finally, we discuss how our more complex BR model augments TCE by further refining the uncertainty concept and updating the theory’s traditional predictions for hybrid governance in the presence of high uncertainty.

**THEORETICAL FOUNDATION**

On the surface, transaction cost economics seems to fully embrace Simon’s behavioral assumption of bounded rationality (Simon, 1957). In fact, TCE employs BR as one of its two major behavioral assumptions (Williamson, 1975, 1985). However, upon closer examination it becomes clear that the use of bounded rationality in TCE is much more limited than Simon’s original conception.

**BR Assumption in TCE**

Herbert Simon developed bounded rationality in response to strict rational models in neo-classical economics, because he wanted economists to incorporate realistic decision-making processes into their research (Bromiley, 2005). In fact, he argued that, “Nothing is more fundamental in setting our research agenda and informing our research methods than our view of the nature of the human beings whose behavior we are studying” (Simon, 1985, p. 303). Under Simon’s definition of BR, “human behavior is intendedly rational but only limitedly so” (Simon, 1961: xxiv) because of restricted cognitive capacities. In formulating TCE, Williamson primarily relied on Simon’s definition of BR

Transaction cost economics focuses on minimizing transaction costs in an exchange through the selection of an *ex post* governance form (market, hybrid or hierarchy) that will most efficiently mitigate the level of hazards present in the transaction (Williamson, 1975; 1985; 1996). Williamson employs the bounded rationality assumption in TCE to suggest that all complex contracts are unavoidably incomplete (Williamson 2000), which leads to significant contracting issues in the face of opportunism. He suggests that contract incompleteness arises from two distinct mental bounds: cognitive limitations and verbal limitations. The cognitive limitations prevent actors from generating all possible contingencies to include in the contract; while verbal limitations attenuate the contract’s content, because an idea cannot be included if it cannot be expressed in words. Together, Williamson felt these two limitations naturally led to incomplete contracts because actors could neither imagine all of the possible contingencies that should go into the contract nor articulate them. In the presence of opportunism, Williamson’s second behavioral assumption, incomplete contracts lead to serious contractual difficulties, which can prevent exchanges from occurring.

**Critiques of BR in TCE**

Williamson suggests “[T]here is growing agreement that bounded rationality is the appropriate cognitive assumption for describing economic organization…” (Williamson, 1993: 97). However, not everyone agrees that TCE bounded rationality assumption is either well operationalized or even a prerequisite for transaction cost economics predictions. Instead, critics argue that its application is either logically inconsistent or completely unnecessary in TCE.

The logical inconsistency critique stems from the fact that TCE suggests actors are both boundedly rational in constructing contracts and fully rational (utility maximizers) in making governance decisions. Critics suggest that assuming that actors are boundedly rational in some aspects of the exchange, while fully rational in others, is logically inconsistent (Dow, 1987; Foss, 1993; Bromiley 2005). Because information processing limitations are well-established in both psychology and neuroscience literatures (e.g. Shiffrin, 1976; Cowan, 2000), it is clear that actors are not selectively subject to cognitive limitations. Instead, they are uniformly affected by cognitive deficits in all aspects of the exchange. Thus, there is truth to this criticism, which suggests the bounded rationality assumption in TCE is not capturing the true nature of decision makers, as Simon intended.

The criticism that the bounded rationality assumption is unnecessary in transaction cost economics comes from the field of economics. Critics from this camp do not believe assuming bounded and strict rationality for different variables in the same model is logical inconsistent. In fact, “asymmetric treatment of the cognitive powers of agents has pretty much become the norm in much of economics and certainly in contract theory” (Foss & Foss, 2000). Instead, these critics suggest that the BR assumption is unnecessary, because incomplete contracts can be explained with a sophisticated treatment of information asymmetry instead (Maskin & Tirole, 1999). Thus, they contend that BR, as it is currently used in TCE, is not adding anything to the predictive value of the theory. Again, there is some truth to this criticism because the complete impact of bounded rationality on governance decisions is not currently explored.

**A More Complex BR Assumption in TCE**

Both criticisms demonstrate that the bounded rationality assumption in transaction cost economics is lacking, but in order to understand exactly what is missing, it is important to examine Simon’s conception of BR more closely. Simon suggested that people were boundedly rational because human cognitive capabilities limited their intended rationality. In his work, he examined at length the impact of limited cognitive capacity for information processing, or processing limitations.

Processing limitations are important bounds on rationality because they limit the individual’s options at the decision point. Without processing limitations, actors would be able to know all possible outcomes of a decision, and could optimize based on the complete consideration set. However, as suggested by psychological and neuroscience studies, human brains cannot processes large quantities of data (Cowan, 2000). Thus, a model of BR without processing limitations cannot capture actual decision-making processes.

However, processing limitations are not the only bounds on rationality that Simon noted. Simon believed that under uncertainty, economic actors physically inhabit a very different world than they experience. That is, the subjective environment is not a reasonable approximation of the “real world” with some details omitted, but is a distorted view created by active perceptual and cognitive processes. Because the two worlds differ so dramatically, Simon suggested it is impossible to predict even rational behavior from objective social characteristics, as they may not influence the actor’s behavior as much as mental processes (Simon, 1982). As such, Simon proposed inclusion of perceptual limitations in bounded rationality (Simon, 1997: 80), like those explored by Tversky and Kahneman (e.g., 1974). Kahneman, supporting Simon’s view, suggested, “Our research attempted to obtain a map of bounded rationality, by exploring the systematic biases that separate the beliefs that people have and the choices they make from the optimal beliefs and choices assumed in rational-agent models.“ (Kahneman, 2003: 1449). Perceptual limitations are important bounds to rationality, because perceptions, not actual outcomes, constitute the consideration set in decision-making.

According to Simon, bounded rationality leads to selective perception of information, use of heuristics, and reconstruction of memory, all which contribute to systematic biases (Mahoney, 2005: 53). Thus, Simon intended bounded rationality to include both cognitive limits on *what* individuals are able to process (processing limitations) as well as *how* they perceive what they do process (perceptual limitations). Both issues are critically important, because they explain complexity in decision-making in organizations, which is not captured by maximization assumptions in neo-classical economics research. However, the transaction cost economics’ bounded rationality assumption only focuses on the implications of processing limitations for governance decisions. Williamson’s early writing clearly illustrates the single nature of the BR assumption, as he originally defines bounded rationality as “…the rate and storage limits on the capacities of individuals to receive, store, retrieve, and process information without error.” (Williamson, 1973: 317). It is only in his later writing that he reverts to Simon’s more expansive definition, yet still ignores perceptual limitations.

Three issues arise from a BR assumption that only takes into account processing limitations. First, actors are subject to biases that potentially distort the information they can process. When TCE ignores the fact that the limited consideration set of contingencies contains distorted options, they fail to accurately model the governance decision process. Thus, TCE predictions under the current conception of bounded rationality may be incorrect as they fail to take transaction costs created from perceptual biases into account.

Second, failing to take into account perceptual biases allows some researchers to suggest actors maximize on their limited consideration sets. Thus, bounded rationality is in essence optimization subject to search cost constraints (e.g. Conlisk 1996). Critics of the maximization view argue that the actors would need greater information processing faculties than those required under strict rationality assumptions, because actors perform two complex calculations instead of one (Bromiley 2005). Apart from the previous criticism, a constrained maximization view of bounded rationality fails to incorporate perceptual biases that may distort the decision even further. As a result, when governance decision processes are modeled in TCE as less detailed versions of reality, researchers are missing key factors in their models, and are thus testing a simplified view of a perfect world.

Finally, perceptual biases can create or mitigate transaction costs, which is an important aspect of transaction cost economics theory. On one hand, if a perceptual limitation creates uncertainty in the exchange, it generates additional transaction costs that should be considered in the governance decision. On the other hand, it is also important to understand how to use perceptual biases to manage employee and partner behaviors. Because biases are systematic, they produce predictable behavior, which can be induced when appropriate to mitigate transaction costs (e.g., managing inter-firm relationships by matching contract framing with task requirements (Weber et al., 2010)). Thus, understanding sources of perceptual limitations and how they impact decisions and behaviors is fundamentally important for TCE researchers.

As previously discussed, TCE embraces the operationalization of bounded rationality as processing limitations; however, adding perceptual biases may change or extend the theory. In Foss’ (2003) call to incorporate psychology into bounded rationality, he focuses on the influence of single cognitive biases (e.g. availability heuristic, reference level biases, adaptive preferences and preference reversal) on economic decisions. We clearly agree that this approach is valuable; however, incorporating the broad category of perceptual biases into TCE’s bounded rationality assumption also directly impacts the theory’s basic governance hypotheses. As such, we argue that it is necessary to examine the impact of a more complex BR assumption on TCE at a more aggregate level.

**Uncertainty in TCE**

Williamson argues, “[b]ut for uncertainty, problems of economic organization are relatively uninteresting” (Williamson, 1985: 30), because the future can be perfectly predicted and addressed in a contract. However, when uncertainty is present in an exchange, it increases the potential for opportunistic behavior when the exchange is characterized by high asset specificity and a small number of suppliers. Although uncertainty plays a key role in transaction cost economics, Williamson does not provide a detailed definition of the concept.

In his work, Williamson primarily characterizes uncertainty as disturbances external to the transaction, which vary in frequency and/or consequence for the exchange (Williamson 1991). He is most concerned with the impact of uncertainty on adaptation, because as the frequency of external disturbances increases, the need to adapt to these unforeseen contingencies rises. Thus, he predicts that hybrid governance, which requires bi-lateral adaptation is not well-suited for transactions with high uncertainty. However, when we unpack the concept of uncertainty further, we see that this is not always the case.

**Informational uncertainty.** Although Williamson does not unpack the concept of uncertainty, he does suggest that it arises from processing limitations. He noted that when “[e]nvironmental uncertainties become so numerous that they cannot all be considered, [they] presumably exceed the data processing capabilities of the parties. The complete decision tree simply cannot be generated...” (Williamson 1975: 24). That is, frequent external disturbances create processing limitations for economic actors, which prevent the parties from being able to predict their partners’ future behavior. We refer to this type of uncertainty, as informational, because it is caused by the actor’s inability to process large quantities of information.

Informational uncertainty arises when transactions are complex. Complex transactions require extensive information processing, which taxes the cognitive abilities of individuals, creating informational uncertainty. Although Williamson seems to acknowledge informational uncertainty, TCE does not explicitly consider economizing on information management transaction costs in the governance decision.

 **Interpretive uncertainty.** In contrast to informational uncertainty, interpretative uncertainty arises when perceptual limitations are incorporated in TCE’s bounded rationality assumption. The source of uncertainty is no longer just information processing limitations. Instead, uncertainty also arises when the parties have different interpretations of the exchange. Perception is an active process influenced by cognitive, emotional and social factors. Because the actors play different roles (e.g. buyer versus supplier) in the exchange and usually have different prior experiences (from their interactions with other actors), they are unlikely to see the exchange in exactly the same way. Different views of the exchange create different expectations, which lead to different behaviors and emotional reactions than the other party might anticipate. Thus, interpretive uncertainty also arises from inside the exchange.

When perceptions of an exchange are particularly divergent, high transaction costs arise due to the misperceptions of the parties. For example, when an exchange is poorly defined, each party may interpret the overall goal or the steps to get their through their organizational or industry perspectives. However, the two parties’ perspectives could be very different, resulting in very different understandings of the events and outcome of the transaction. Under these circumstances, two parties can write a contract together and walk away from the negotiation with entirely different perceptions of the agreement, which can lead to great financial and/or legal consequences. Thus, misperception transaction costs are not trivial and should be addressed when choosing an efficient governance form for the exchange.

**Williamson’s Uncertainty.** In Williamson’s uncertainty concept, adaptation issues are the main consequence of uncertainty. However, under informational uncertainty, information management issues abound, and under interpretive uncertainty misperception issues dominate. So, when are the adaptation concerns that Williamson is concerned with important to exchange success? When both informational and interpretive uncertainty are present in a transaction, adaptation issues arise. For example, when an exchange is both complex and ill-defined, both informational and interpretive uncertainty arise. Because the large amount of information taxes informational limitations, and the poorly defined problem creates interpretive issues, it is difficult to predict contingencies, because there are many and they are hard to anticipate. Thus, the traditional uncertainty concept in TCE is concerned with a combination of informational and interpretive uncertainty.

**PROSITION DEVELOPMENT**

Because TCE did not originally include perceptual limitations in the bounded rationality assumption, the theory does not delineate uncertainty into informational and interpretive. When both types of uncertainty are considered, the traditional propositions regarding hybrid governance under uncertainty are further refined, as hybrids can actually reduce misperception and information management transaction costs. See Table 15 for an overview of the propositions under a more complex bounded rationality assumption.

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**Low informational & interpretive uncertainty.**In some transactions, parties exchange non-complex goods for money. For example, when a firm purchases an off-the-shelf computer program from a supplier, the supplier sends a pre-specified quantity of the computer program to the buyer, who then pays for the products. Simplistic exchanges, such as these, generally have a low potential for both informational and interpretive uncertainty (Quadrant 1).

Informational uncertainty is low in this type of transaction for two reasons. First, the cognitive load of the exchange information is not particularly heavy, as there are usually only three pieces of information to remember: 1) quantity, 2) delivery date, and 3) price. As a result, there is not a lot of information to process, so the parties in the transaction will not experience information overload. Additionally, the contingencies for the exchange are likely to be few in number and predictable, because the exchange is simple and well-defined. Even if an outside disruption did occur, the buyer can usually find an alternative source for the non-complex product. As a result, new information will not have to be frequently incorporated by the exchange parties.

There is also little ambiguity in interpreting the exchange task, as it is fairly simplistic—an exchange of goods for money. The parties usually agree on the objective aspects of the exchange *ex ante* (the quantities, prices and delivery dates), so there is little room for misinterpretation. Additionally, the rules of this type of exchange are well understood by both parties and are fairly standard across industries and countries. Thus, neither informational nor interpretive uncertainty generates additional transaction costs in simplistic exchanges. As a result, the transaction may be governed by spot market exchanges, absent other transaction hazards laid out by Williamson.

If the level of asset specificity is such that a contract is necessary, even without the moderation of uncertainty, it is not necessary for the parties to use the document to overcome informational or interpretive uncertainty. Thus, the contract is primarily used as an enforcement mechanism in the exchange, with safeguards built into the standard terms and conditions of the template. Additionally, because there are low information requirements in the transaction, the contract does not need extensive customization. Instead, the quantity, price and delivery dates are generally filled into the contract template. As a result, simplistic exchanges, with low informational and interpretive uncertainty, are more likely to be conducted as spot market transactions or governed by standard contract templates.

**Proposition 1:** *Exchanges characterized by low informational uncertainty and interpretive uncertainty are more likely to be conducted as spot market transactions or governed by standard contract templates than alternative governance forms.*

**High informational-Low interpretive uncertainty.**In other transactions, the exchange task is complex, but still well-defined (Quadrant 2). For example, in the implementation of an SAP system both parties understand their roles and how the exchange will progress. Thus, the potential for interpretive uncertainty is low, because there is little room for perception when the task requires specific well-defined steps to complete.

In contrast, the informational uncertainty in this type of task is high for two reasons. First, as illustrated by an SAP implementation, a very complex task requires the exchange and management of a lot of information. So, the transaction is characterized by high informational uncertainty, as the exchange participants are only capable of processing a limited subset of the information in the task. External disturbances create additional informational uncertainty in the exchange, because new information must be incorporated into the implementation when a change occurs. The new information further taxes the participant’s mental faculties, leading to even more informational uncertainty. Thus, complex, but well-defined exchanges are characterized by low interpretive uncertainty, but high informational uncertainty.

High informational uncertainty creates additional transaction costs, beyond those created by traditional exchange hazards. These information costs arise because time and money must be spent on information management for the exchange to occur. As with traditional transaction costs, different governance forms are more or less capable of mitigating information costs efficiently.

In order to reduce information costs, the governance form must encompass a mechanism for information management. Markets manage price information well, but cannot effectively deal with the information complexity in this type of exchange. Thus, they do not sufficiently address the high information costs in an exchange with a complex, but well-defined, task. In contrast, complex contracts, a hybrid governance form, allow for information management.

Complex contracts are likely based on a template, but are extensively elaborated to specify rules and responsibilities in detail, and capture large numbers of complex contingencies. They address the first source of informational uncertainty by acting as an information repository, because they codify both large quantities of detailed information about the exchange task, and how the parties will interact with one another (Mayer & Argyres, 2004). They also serve as categorization tools, easing information constraints by allowing the partners to process greater quantities of information (Daft & Weick, 1986).

They also address the second source of information costs, external disturbances. In a well-defined task, it is less difficult to envision relevant contingencies and their likelihoods than in a poorly defined task. However, when the well-defined task is also complex, the number of potential contingencies rises dramatically. As with the previous source of informational uncertainty, an information management mechanism is necessary to allow the parties to cope with the large quantity of information necessary to prevent the exchange from derailing. Again, the complex contact, acting as an information repository, captures all of the relevant contingencies, reducing information costs in the transaction. As a result, complex contracts efficiently mitigate adaption transaction costs arising from informational uncertainty, by acting as an information repository, compensating for the actors’ information processing deficits. While hierarchy also provides mechanisms for information management, complex contracts are sufficient for the information needs of complex, but well-defined, exchanges. So, firms do not have to incur the additional costs associated with hierarchy in order to mitigate information costs in this type of exchange.

**Proposition 2:** *Exchanges characterized by high informational uncertainty and low interpretive uncertainty are more likely to be governed by complex contracts containing high levels of task detail and contingency clauses than alternative governance forms.*

 **Low informational-High interpretive uncertainty.**In contrast, other exchanges involve non-complex, but ill-defined projects (Quadrant 3). For example, if a network hardware firm works with a mobile device software firm to create a novel wireless network product, the project is likely ill-defined, but not complex. Although the task involves technology, it is not considered complex, because it is composed of two modular parts, which both firms understand intimately. The firms likely need to modify the two technologies slightly to work together, but the project does not require significant modification or the development of new technology. Low task complexity results in low informational uncertainty in this type of exchange.

In contrast, it is usually extremely difficult to define the parameters of a novel project prior to the start of the project. That is, the firms do not know exactly what functionality they can offer customers. Instead, they know that their technologies are compatible and will likely create new functionality. The inability of the exchange partners to define the task *ex ante* leads to high interpretive uncertainty, as the two parties may not see the task in the same way as it unfolds. Additionally, the two firms are from different industries, and may even be from different countries. As a result, the two firms may not speak the same literal or figurative language, leading to even more interpretive uncertainty in the transaction. Thus, an exchange with a non-complex, ill-defined task results in a high probability of misinterpretation, but do not require large amounts of information processing.

Interpretive uncertainty creates misinterpretation transaction costs, because differences in the perceptions of tasks lead to conflict between the parties and prevent the each party from predicting its partner’s behavior in the exchange. As opposed to complex exchanges, ill-defined tasks require a framework for a unifying vision of the project, even when it cannot be defined *ex ante*. Markets cannot offer a unified vision, as there is no common framework under which the two parties in the exchange can view the task. Additionally, simple and complex contracts cannot create a mutual framework if the task cannot be defined at the time of the contract negotiation. Finally, contingencies are very difficult to determine when the project is ill-defined, so external disturbances substantially impact the exchange. Thus, contracts do not effectively mitigate misinterpretation costs.

Joint ventures (JVs) offer a mutual interpretive lens for the parties to view the task as it unfolds. By uniting the employees from the two firms into a single legal entity and allowing it to self-govern, the employees from the two firms are more likely to create a unified definition of the task. The joint venture also provides an organizational culture that supports and propagates the unifying view. Thus, the JV may well allow even extreme perceptual limitations to be overcome in the exchange. Additionally, because the exchange is not complex, fewer contingencies generally arise than in a complex project, so the unifying framework is sufficient to guide the partners through the occasional external disturbance. Again hierarchal governance also creates a common view of the task, but a joint venture is adequate to mitigate the transaction costs arising from interpretative uncertainty. As a result, firms do not need to bear the expense of integration, because non-complex, but ill-defined exchanges can be governed efficiently by joint ventures, a form of hybrid governance.

**Proposition 3:** *Exchanges with low informational uncertainty and high interpretive uncertainty are more likely to be governed by joint ventures than alternative governance forms.*

**High informational & interpretive uncertainty.**Finally, some exchanges are both complex and ill-defined (Quadrant 4). When two firms from different industries collaborate on a novel technology, for example, both informational and interpretive uncertainties are high, and adaptation becomes an important factor. First, developing a new technology is an extremely complex task, so the project requires extensive information processing. Second, the project itself is ill-defined, preventing the firms from outlining the exchange task in detail *ex ante*. Additionally, each firm views the new technology through a different lens because different industries have different language, norms and standards, and the firms have different experiences within their respective industries. Thus, additional transaction costs result from disparate perceptions of the task. Finally, adaptation plays an important role in these tasks. Unlike the other types of tasks, contingencies tend to be both difficult to anticipate, due to lack of task definition, and numerous, due to task complexity. Thus, environmental disruptions create high adaptation costs in these exchanges, which must be considered in the governance decision.

In Williamson’s original uncertainty concept, adaptation issues are the main consequence of uncertainty. Although information management is key in the face of informational uncertainty and misperception issues dominate in the face of interpretive uncertainty, when an exchange encompasses both types of uncertainty, adaptation issues become very important. Thus, in complex, ill-defined exchanges, information, misperception and adaptation transaction costs abound. These three transaction costs require that the governance mechanism acts as an information repository, a unifying framework, and an adaptation mechanism. Clearly, market governance is not an option, as it performs none of these functions well. Additionally, contracts are ill-suited for these types of exchanges, because if the task cannot be outlined *ex ante*, the legal document cannot be used as an information repository. Additionally, it will be much less effective at creating a mutual framework, as the two parties remain independent entities, and cannot put a mutual definition of the exchange in writing. It will also not allow easy adaptation, because the parties remain independent and must bilaterally adapt to any external disruptions. So, complex contracts are also not capable of efficiently governing complex, ill-defined exchanges. Finally, while joint ventures successfully create a common interpretive frame and can potentially act as an information repository, they still do not provide a unilateral adaptation mechanism suitable to the frequent, unpredictable external disturbances characteristic of these exchanges. Instead, the parent firms in the JV have some influence on how the external disturbance will be addressed. As a result, there are often three parties, each of the parents and the joint venture itself, negotiating the adaptation strategy, which is clearly less efficient than the unilateral adaptation of hierarchical governance.

Hierarchy mitigates transaction costs from both informational and interpretive uncertainty in two ways. First, it provides an overarching framework, creating common perceptions of the exchange. Second, it acts as an information repository, allowing more information about the task to be processed using common categorization and organizational tools such as informational management systems. Additionally, hierarchy tempers information processing issues by removing limitations of tacit information transfer present in inter-firm exchanges (Grant, 1996). Most importantly, however, hierarchical governance provides the most efficient adaptive response to frequent, unpredictable external disturbances in exchanges (Williamson 1991). Under hierarchy, one party creates a cohesive plan to adapt and implements it through fiat. Thus, when an exchange is characterized by both informational and interpretive uncertainty, Williamson’s original prediction stands, as hybrids are replaced by hierarchy.

**Proposition 4:** *Exchanges characterized by high information uncertainty and high interpretive uncertainty are more likely to be governed by hierarchy than alternative governance forms.*

**DISCUSSION**

Our paper responds to a previous call for incorporating cognitive and social psychology into bounded rationality to better model governance decision-making (Foss, 2003). However, it goes beyond offering applications of a few cognitive limitations and offers three main contributions to the strategy literature. First, it makes the distinction between processing and perceptual limitations, which clarifies what is missing from the traditional BR conceptions, and exactly how cognitive and social psychology can add value to organization research. Second, it refines the concept of uncertainty in transaction cost economics. Instead of a generic concept relegated to external forces, it suggests that both informational and interpretative uncertainty impact exchanges in very different ways. Third, this paper identifies three novels types of transaction costs created by uncertainty: 1) information management costs, 2) misperception costs, and 3) adaptation costs. Finally, it uses these three costs to revise traditional governance predictions concerning hybrid governance and uncertainty.

We demonstrate the benefit of expanding the concept of bounded rationality in strategy research to include perceptual and processing limitations. The transaction cost economics’ bounded rationality assumption implies that processing limitations prevent actors from knowing all possible outcomes, leading to incomplete contracts. However, perceptual biases, the potential for information distortion (intentional or accidental), are completely ignored. When they are taken into account, not only is the actor lacking all of the information to make the decision, but the information that he or she does have may be systematically biased. By understanding how perceptual limitations influence governance decisions, TCE researchers can understand when the distortions are detrimental and when they may in fact be used strategically to improve exchange performance.

Add paragraph about the uncertainty concepts.

Add a paragraph about the novel transaction cost types.

Add a paragraph summarizing the propositions.

TCE’s current bounded rationality assumption only addresses exchanges in the top half of the table. Quadrant 1 aligns with either spot market exchanges or simple contracting, while Quadrant 2 aligns with complex contracting, requiring large quantities of information processing. However, when perceptual limitations are incorporated into the BR assumption, TCE also addresses the bottom half of the table. Exchanges in Quadrants 3 and 4 also have high probabilities of perceptual biases, which generate additional transaction costs if not overcome, as firms waste time and money attempting to produce against unclear expectations. Thus, we are suggesting that incorporation of perceptual limitations into TCE can influence governance choice because it does affect transaction costs. The important extension for TCE arises from a more complex bounded rationality assumption than currently used in the theory.

Add a paragraph about how we believe this is a first step and that we need to examine how specific biases impact TCE as well (the Foss suggestion).

Call for studies to examine these propositions and how perceptual biases impact TCE.

Suggest experiments as a potentially valuable method for this type of work.

Finally, we believe that our paper demonstrates the idea that multidisciplinary research allows different questions to be explored than those typically examined within one of the base disciplines alone, as suggested by Agarwal and Hoetker (2007). As such, we feel that it represents a modest but significant step towards incorporating psychological effects into mainstream strategy research, because it demonstrates how beneficial multi-disciplinary research can be for the field. Additionally, the ideas presented here are not just interesting theoretical insights that are not testable. Instead, they can be examined using laboratory experiments, field experiments and traditional large dataset studies, as demonstrated by Weber et al. 2010. Therefore, we argue that research incorporating psychology and economics into strategy offers both interesting theoretical and empirical insights for the field of strategy.

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**tables**

Table 15:Impact of a More Complete BR Conception on TCE
(Adapted from original table in Williamson 1985: 67.)

|  |  |  |
| --- | --- | --- |
|  |  | **Informational Uncertainty** |
| Absent | Present |
| **Interpretive Uncertainty** | Absent | **Quadrant 1**1. No additional TCs
2. Market Governance
 | **Quadrant 2**1. Information management TCs
2. Complex contracts (hybrid): Information repository & higher order adaptation mechanisms
 |
| Present | **Quadrant 3**1. Misperception TCs
2. JV (hybrid): Interpretation frame
 | **Quadrant 4**1. Information management, misperception & adaption TCs
2. Hierarchy: Information repository, fiat (unilateral adaptation mechanism) & interpretation frame
 |