Public-Private Partnerships: Cognitive Biases In The Field

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PUBLIC-PRIVATE PARTNERSHIPS: COGNITIVE BIASES IN THE FIELD
Marc van Buiten¹ and Andreas Hartmann²

ABSTRACT
This paper identifies two key managerial challenges of public-private partnerships (PPPs), i.e., (1) the management of multi-organizational complexity, and (2) the management of multi-managerial level complexity. We argue that the literature on human judgment and decision making (JDM) can offer valuable insights into these challenges. Specifically, (subpar) performance of PPPs may partly be determined by cognitive biases whose occurrence and prevalence in turn depends on the specific characteristics and context of PPPs. A three-step approach to deal with cognitive bias is suggested. Based on two observations about decision making, we advance the notion of premature narrowing of focus as a major determinant of cognitive bias that can be resolved through (1) structure-modifying debiasing (i.e., “fixing” cognition), procedural debiasing (i.e., “fixing” decisional context), or (3) rebiasing (i.e., manipulating cognition or decisional context), if and when the benefits of improved performance outweigh the costs of managerial intervention. We illustrate the relevance of JDM research for our understanding of challenges in public-private collaborations by analyzing data from an evaluation study of a partnership project between the Dutch Highways and Waterways Agency and a Dutch maintenance contractor. Implications for future research are discussed.

KEYWORDS: decision making, biases, public-private partnerships

INTRODUCTION
The provision of infrastructures is challenged by the existence of various market failures (e.g., collective goods, externalities, and network effects) that prevent markets from functioning efficiently. Traditionally, this triggered large-scale government intervention creating highly regulated and vertically integrated infrastructure sectors. Several developments, especially governmental budgetary considerations and a focus on value-for-money more broadly (Dewulf, Blanken, & Bult-Spiering, 2012), have forced owners of infrastructures to experiment with forms of infrastructure governance that involve private parties. Private sector suppliers are not only contracted to construct large-scale infrastructure projects, they are also assigned the financing, development, operation and maintenance of these facilities. Central to this on-going reorientation is the transition from procuring single goods and services—as was done in the past—to procuring integrated service packages based on performance descriptions rather than detailed work specifications (Tang, Shen, & Cheng, 2010). The extensive use of public-private partnerships (PPPs) to deliver critical infrastructure is the most prominent sign of this transition process. Changes of this nature depend on new forms of procurement, contracts, incentive systems and cooperation, which align the agency and its suppliers to deliver improved

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infrastructure performance. This has posed several managerial challenges, ranging from sustaining contractual flexibility required to adequately respond to dynamic developments at the strategic level of the agency or its larger environment, to building contractual and relational capabilities (Hartmann, Davies, & Frederiksen, 2010).

In this paper, we identify and discuss key managerial challenges related to PPPs in construction. These challenges are subsequently examined from a judgment and decision making (JDM) perspective in order to propose ways to improve the decision making of PPPs. We illustrate the potential relevance of JDM by analyzing data from a collaboration between the Dutch Highways and Waterways Agency and a Dutch maintenance contractor. Implications for practice and research are discussed.

MANAGERIAL CHALLENGES OF PUBLIC-PRIVATE PARTNERSHIPS

PPPs, and other related forms of public-private collaborations in the delivery of infrastructure, are increasingly being viewed as important asset management tools for public agencies. PPPs bring together public and private sector parties to work together towards agreed-upon objectives, presumably because both public as well as private parties stand to benefit from the collaborative effort (Dewulf et al., 2012). As such, PPPs are hybrid organizational structures of public and private regimes. Despite a long history of outsourcing asset management services to the private sector, PPPs introduce additional complexity to asset management.

The vast complexity of asset management becomes apparent when asset management is viewed in terms of (constrained) optimization. Asset management involves trading off multiple objectives, subject to several constraints (e.g., budgetary, but also institutional and technological), with many decision variables, risk, uncertainty, ambiguity, and intertemporal aspects. Designing, adopting, and managing infrastructure assets through appropriate contracting schemes in line with stated objectives and within the scope of possibilities as defined by the constraints is therefore no easy feat.

PPPs and related arrangements that cut across organizational boundaries (public and private) essentially define the division of operations in the supply chain. Management needs to address both issues arising within the confines of the own organization, as well as those pertaining to the ongoing collaboration that transcend organizational boundaries. To stay on the trajectory from plan to realization envisioned at the outset of the project, a key challenge for owners of infrastructures is to manage the transition from coordination within the organization to coordination across organizations (e.g., Hartmann, Roehrich, Frederiksen, & Davies, Forthcoming 2013). Managerial complexity is compounded, especially considering the enormity of the typical infrastructure project, by the need for proper coordination across managerial levels.

The across-organizational-boundaries challenge

Different mechanisms may underlie the organizational boundaries in the supply chain. For example, using certain restrictive assumptions about human rationality, neoclassical economics predicts that natural monopolies emerge when economies of scale exist that favor a single supplier.

Institutional economics, in particular transaction cost economics (Coase, 1937; Williamson, 1975), imposes notions such as bounded rationality and transaction costs (e.g., search, information, bargaining, and enforcement costs) due to asset specificity, uncertainty, and
transaction frequency to explain the existence of organizational boundaries. Other complementary mechanisms are conceivable. For example, borrowing from political science, one might expect organizational boundaries to be the result of managers pursuing power and status, i.e., “empire building” (Hope & Thomas, 2008).

Government regulation is often invoked when the organizational boundaries that naturally emerge in markets are deemed undesirable for society as a whole. Historically, as economists have dominated this debate, this has primarily entailed judging the efficiency of organizational arrangements. Consequently, inefficiencies identified in the provision and maintenance of infrastructures has resulted in a highly regulated sector.

The turn to PPPs, following budgetary pressures, may not be without its problems. Finger, Groenewegen, and Künneke (2005) argue that infrastructure performance depends on the coherence between technical and institutional coordination of infrastructures. They argue that recent discussions about market restructuring towards competition and privatization overlook potentially detrimental effects on the technical coordination of infrastructures if the latter is left unchanged. Conversely, a change of technical coordination necessitates corresponding changes in institutional coordination.

Whatever the merits of PPPs, owners of public infrastructures need to address the managerial issues surrounding PPPs, if only to manage ongoing projects effectively. Of key importance in understanding PPPs is the long-term, but still temporary nature of this type of inter-organizational collaboration in a sector that has various, but still a limited number of key players. This means that each player is (or should be) constantly aware of his current interests, how these might change over time, and how this impacts future collaborations and involvements with others in the sector.

The across-organizational-levels challenge

Existing contracting practices of asset owners arguably represent a messy compromise aiming to satisfy multiple objectives of asset management at different management levels (Koppenjan & Verlaan, 2009). More specifically, there is an in-build and ongoing tension between the strategic level’s need to exploit the market mechanism by negotiating competitive formalized contracts in the primary stages of projects, and the operational level’s need for collaborative informal contact in the latter stages of projects. A focus on flexibility, integrality of scope, quality, and informal relationship management, although desirable, may thus not always be attainable in practice. In this way, standardized top-level regulation from national, or even supranational (e.g., EU), authorities can adversely impact lower-level operations. Relatedly, those in charge of the day-to-day operations may not, and often do not, know all the intricacies of the PPP-contract (e.g., distribution of risks and responsibilities across partners), but nonetheless have to find and implement solutions to problems that come up.

HEURISTICS, BIASES, AND CHOICE BEHAVIOR

The now vast literature on human judgment and decision making may provide insights into problems surrounding managerial decision making in PPPs, and may ultimately help tackle the across-organizational-boundaries and across-organizational-levels challenges addressed above.
From relatively simple to highly complex decisions such as those facing managers of
PPPs, the basic underlying process is similar. It involves perceiving the problem and objectives,
generating possible courses of action, calculating the best course of action, and finally arriving at
a decision (Bazerman & Moore, 2009, p. 3, discuss several similar characterizations of the
choice process). In other words, decision making entails the process of bridging the gap between
the current and desired situation by selecting the best from all available options. However, this
process can and does, sometimes, fall apart somewhere along the way.

Over the last decades many studies have revealed the limitations of human judgment and
decision making (Ariely, 2010; Brooks, 2008; Kahneman, 1991, 2011b; Weber & Johnson,
2009). Several multidisciplinary fields of study have emerged that integrate insights from
economics with those from psychology, such as behavioral economics, and behavioral game
theory. These fields have fundamentally changed our view of choice behavior.

Contrary to early conceptions, choice behavior is now believed to depend on various
situational and personal characteristics that may violate normative benchmarks of behavior. No
longer are decision makers viewed as hyper-rational entities endowed with unlimited processing
powers that reveal well-defined and stable preferences through their choices. In contrast, there
are limits to our rationality and preferences are discovered, learned, or even constructed in the
decision making process (Camerer, Loewenstein, & Rabin, 2003). The traditional depiction of
human choice behavior in economics is reduced to a special case that constitutes a reasonable
approximation for purposes of economic modeling only under certain (restrictive) conditions
(e.g., repeated exposure to a choice problem, certain incentives, access to accuracy-enhancing
information)\(^1\). The immense literature on decision making covers situations of certainty, risk,
uncertainty, ambiguity, as well as intertemporal choice settings, and theorizing ranges from
traditional fairly abstract approaches based on value maximization to those starting from
elementary, underlying psychological processes (e.g., Birnbaum, 2008; Johnson & Busemeyer,
2010; Soman et al., 2005; Starmer, 2000). The various theories are not necessarily mutually
exclusive, but instead may reflect different levels of analysis (McClamrock, 1990) where process
models are decompositions of higher-level functional models.

People’s choices sometimes violate elementary rationality assumptions such as
description and procedural invariance, i.e., standards dictating that choices should depend only
on substantive elements of decision problems and not on inconsequential facets such as linguistic
variations and the specifics of the elicitation method that is employed. Yet, framing effects
(violation of description invariance) and preference reversals (violation of procedure invariance)
are classics within the JDM literature. To illustrate framing effects consider the Asian disease
problem studied by Tversky and Kahneman (1981). They showed that people are generally risk
averse when choice alternatives are described in terms of gains, but are risk seeking when
alternatives are depicted in terms of losses\(^2\). The quintessential preference reversal refers to the
phenomenon that people tend to prefer a bet that has a high probability to win a modest amount
of money over a bet that has a low probability to win a large amount of money, whereas a larger
monetary value is placed on the latter bet (e.g., Slovic & Lichtenstein, 1983).

Relatedly, context effects demonstrate, contrary to traditional economic theory, the
dependence of preferences on other choice alternatives. For example, people tend to prefer so-called compromise alternatives, i.e., alternatives with moderate attribute values (Simonson &
Tversky, 1992).

Also, and even more fundamental, people’s basic (probability or risk) judgments, even
those of highly trained professionals (Bazerman & Moore, 2009), can be severely biased. To
illustrate, consider the well-known and controversial Linda problem (Camerer, 1995; Charness, Karni, & Levin, 2010; Tversky & Kahneman, 1983). This study revealed a tendency, violating basic laws of probability, to judge a conjunction of events (e.g., bank teller occupation and active involvement in the feminist movement) more likely than either event alone.

The “heuristics & biases research program” initiated by Kahneman and Tversky has championed the notion that judgment consists of routinely applying simplifying cognitive shortcuts (i.e., heuristics) rather than extensive cognitive processing, sometimes resulting in distorted judgments (i.e., biases). For example, the conjunction fallacy committed by participants in Linda problem suggests that people simply judge probabilities on the basis of resemblance. The conjunction of events, although mathematically less likely, simply appears most representative of Linda. This is referred to as the representativeness heuristic. More recently, this quick-and-dirty approach has been captured in a more comprehensive account of human judgment and decision making involving two-system theorizing (Kahneman, 2011b; Stanovich & West, 2000).

Proposals to classify biases have been put forward of which most make no claim of comprehensiveness (e.g., Arnott, 2006; Bazerman & Moore, 2009; Das & Teng, 1999; Garbuio, King, & Lavallo, 2011; Hammond, Keeney, & Raiffa, 2006; Lavallo & Sibony, 2010; Stanovich, 2009). We will discuss a few of these taxonomies for illustrative purposes only.

At the very least (e.g., Carpenter & Sanders, 2007), one can disentangle biases related to ourselves (e.g., overconfidence bias), biases about others (e.g., in-group–out-group bias), and biases concerning the world (e.g., probability biases).

From a JDM perspective, an even more straightforward and appealing way of systematizing bias is linking them to the heuristics from which they presumably emanate (see Tversky & Kahneman, 1974). Bazerman and Moore (2009, p. 41) list twelve biases and link them to three heuristics, i.e., the availability, representativeness, and confirmation heuristic (see Table 1 for details). Separately, they discuss biased judgment due to a fourth heuristic, namely the affect heuristic (Bazerman & Moore, 2009, pp. 84-100). Larrick (2004) provides a similar cause-based classification, attributed to Arkes (1991). This classification traces biases back to psychophysically-, association-, and strategy-based error.

Another slightly more detailed taxonomy that goes slightly beyond cognitive biases alone is offered in Lavallo and Sibony (2010). They distinguish 5 classes (with a total of 17 biases) which they label action-oriented biases, interest biases, pattern-recognition biases, stability biases, and social biases (see Table 2 for details). Arnott (2006) identifies as much as 37 biases and sorts them into memory biases, statistical biases, confidence biases, adjustment biases, presentation biases, and situation biases (see original reference for details). A popular textbook on JDM even presents 53 biases and sorts them into attentional, motivational, and psychophysical biases (Baron, 2008, Table 2.1).

Offering an integrative account of the heuristics and biases research program is troublesome as the still expanding literature is fragmented and theoretical convergence has been slow (Garbuio et al., 2011, p. 14; but see Hilbert, 2012). Although the taxonomies discussed above are of some value as they provide clarity where it is needed, a truly comprehensive theory of bias, or better still, a theory of all judgment and decision making, has yet to be developed.
<table>
<thead>
<tr>
<th>Bias</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Biases emanating from the availability heuristic</strong></td>
<td></td>
</tr>
<tr>
<td>Ease of recall</td>
<td>Tendency to judge events easily recalled from memory (based on vividness or recency) to be more numerous than events of equal frequency that are less easily recalled.</td>
</tr>
<tr>
<td>Retrievability</td>
<td>Tendency to judge frequency based on memory structures involved in the search process.</td>
</tr>
<tr>
<td><strong>Biases emanating from the representativeness heuristic</strong></td>
<td></td>
</tr>
<tr>
<td>Insensitivity to base rates</td>
<td>Tendency to ignore base rates in likelihood judgments when other descriptive information is provided (even if that information is irrelevant).</td>
</tr>
<tr>
<td>Insensitivity to sample size</td>
<td>Tendency to ignore sample size in judgments about the reliability of sample information.</td>
</tr>
<tr>
<td>Misconceptions of chance</td>
<td>Tendency to believe random processes to generate prototypical data sequences that look truly “random”, even when data sequences are too short for those believes to be statistically valid.</td>
</tr>
<tr>
<td>Regression to the mean</td>
<td>Tendency for judgments to be insensitive to the fact that extreme events regress to the mean on subsequent trials.</td>
</tr>
<tr>
<td>Conjunction fallacy</td>
<td>Tendency to judge conjunctions to be more probable than a more global set of events.</td>
</tr>
<tr>
<td><strong>Biases emanating from the confirmation heuristic</strong></td>
<td></td>
</tr>
<tr>
<td>Confirmation trap</td>
<td>Tendency to seek confirmatory evidence for believes people hold and the associated failure to search for disconfirmatory evidence.</td>
</tr>
<tr>
<td>Anchoring</td>
<td>Tendency to base judgments on a salient initial value and insufficiently adjust from that anchor.</td>
</tr>
<tr>
<td>Conjunctive and disjunctive events bias</td>
<td>Tendency to overestimate the probability of conjunctive and underestimate the probability of disjunctive events.</td>
</tr>
<tr>
<td>Overconfidence</td>
<td>Tendency to be overly confident in one’s ability to answer moderately to extremely difficult questions.</td>
</tr>
<tr>
<td>Hindsight and the curse of knowledge</td>
<td>Tendency to overestimate, in hindsight, the ability to predict events after finding out what truly happened. In addition, people typically fail to ignore information they but others do not possess when predicting other’s behavior.</td>
</tr>
</tbody>
</table>

*Note.* In the interest of space and consistency of presentation, (slight) editorial changes were made in the descriptions of the biases relative to those used in the original text.
Some biases may seem almost identical and hard to separate (e.g., Moore & Healy, 2008), whereas others may seem very dissimilar. However, apparently dissimilar biases may share common underlying psychological mechanisms, whereas those that appear similar may have very distinct psychological causes. In addition, the line between bias (i.e., the behavioral effect) and preceding psychological mechanism is sometimes blurry (see e.g., Birnbaum, 2008, p. 466). For example, loss aversion may either be described as the (behavioral) tendency to avoid losses more strongly than to approach equally-sized gains, or the hardwired psychological processes that can help explain the existence of cognitive biases such as the endowment effect. Relatedly, the same phenomenon may either be referred to as a heuristic (e.g., anchoring-and-adjustment heuristic) or bias (e.g., anchoring-and-adjustment bias). The same sort of terminological or conceptual confusion arises in other parts of the literature. For example, risk aversion may either refer to the degree of risk-taking as evidenced by choice behavior, or to the individual personality trait believed to determine, together with situational factors, risk-taking behavior (Weber & Johnson, 2008). Similarly, in research on time discounting it is sometimes hard to separate out pure time preference specific to the individual from the overall imputed discount rate (Soman et al., 2005).

Table 2 Taxonomy of biases: summary of Lovallo and Sibony (2010)

<table>
<thead>
<tr>
<th>Bias</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action-oriented biases</strong></td>
<td>Biases towards relatively thoughtless action.</td>
</tr>
<tr>
<td>Excessive optimism</td>
<td>Tendency to be overoptimistic about the outcome of planned actions, to overestimate the probability of positive events and to underestimate the probability of negative ones.</td>
</tr>
<tr>
<td>Overconfidence</td>
<td>Tendency to overestimate our skill relative to others leading us to overestimate our ability to affect the future, take credit for past outcomes, and neglect the role of chance.</td>
</tr>
<tr>
<td>Competitor neglect</td>
<td>Tendency to plan without factoring in competitive responses.</td>
</tr>
<tr>
<td><strong>Interest biases</strong></td>
<td>Biases that stem from conflicting incentives including nonmonetary and emotional ones.</td>
</tr>
<tr>
<td>Misligned individual incentives</td>
<td>Tendency to genuinely (not cynically) hold views or seek outcomes favorable to oneself or one’s unit at the expense of the overall interest of the company.</td>
</tr>
<tr>
<td>Inappropriate attachments</td>
<td>Tendency to create emotional attachments to people or elements of the business resulting in misalignment of interests.</td>
</tr>
<tr>
<td>Misligned perception of corporate goals</td>
<td>Tendency of people to hold conflicting perceptions (often unspoken) about hierarchy or relative weight of and trade-offs between objectives pursued by the company.</td>
</tr>
<tr>
<td><strong>Pattern-recognition biases</strong></td>
<td>Biases towards recognizing patterns even where there are none.</td>
</tr>
<tr>
<td>Confirmation bias</td>
<td>Tendency to seek confirmatory evidence for believes people hold and the associated failure to search for disconfirmatory evidence.</td>
</tr>
<tr>
<td>Bias</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Management by example</td>
<td>Tendency to generalize based on memorable or recent examples.</td>
</tr>
<tr>
<td>False analogies</td>
<td>Tendency to rely on comparisons with situations that are not directly comparable.</td>
</tr>
<tr>
<td>Power of storytelling</td>
<td>Tendency to remember and believe facts more easily when they are part of a coherent story.</td>
</tr>
<tr>
<td>Champion bias</td>
<td>Tendency to evaluate a plan or proposal based on the track record of the person presenting it, more than on the facts supporting it.</td>
</tr>
<tr>
<td>Stability biases</td>
<td>Biases towards inertia in the presence of uncertainty.</td>
</tr>
<tr>
<td>Anchoring-and-adjustment bias</td>
<td>Tendency to base judgments on a salient initial value and insufficiently adjust from that anchor.</td>
</tr>
<tr>
<td>Loss aversion</td>
<td>Tendency to feel losses more acutely than equally-sized gains, resulting in excessive risk aversion.</td>
</tr>
<tr>
<td>Sunk-cost fallacy</td>
<td>Tendency to factor-in unrecoverable (irrelevant) historical costs when considering future courses of action.</td>
</tr>
<tr>
<td>Status quo bias</td>
<td>Tendency to prefer the status quo in absence of pressure to change it.</td>
</tr>
<tr>
<td>Social biases</td>
<td>Biases that stem from the preference for harmony over conflict.</td>
</tr>
<tr>
<td>Groupthink</td>
<td>Tendency to strive for consensus at the cost of a realistic appraisal of alternative courses of action.</td>
</tr>
<tr>
<td>Sunflower management</td>
<td>Tendency for groups to align with the views of their leaders, whether expressed or assumed.</td>
</tr>
</tbody>
</table>

Note. In the interest of space and consistency of presentation, editorial changes were made in the descriptions of the biases relative to those used in the original text.

Fortunately, the relevance of JDM research for the field of construction management does not hinge on the comprehensiveness of the taxonomies and conceptual clarity as we will try to outline in the next section.

**PPPs AND COGNITIVE BIASES**

From a JDM perspective, construction management and PPPs in particular are highly interesting. PPPs involve very complex decision making processes that have an undeniably big societal impact. Given the societal impact, it is surprising that cognitive biases have not been studied more extensively as has been the case for example in the health sector (e.g., Chapman & Sonnenberg, 2003).

A basic premise of this paper is that cognitive biases distort managerial decisions in PPPs, thereby affecting performance, and thus should be dealt with if possible and profitable. We propose an iterative three-step process to this effect that may aid social scientists as well as professionals in construction management, especially those involved in PPPs. The number of
steps is, of course, somewhat arbitrary and others may specify a divergent number of steps, but we believe our approach to be simple yet fairly comprehensive. We note that together the three steps may be viewed as the first two stages of the well-known PDCA (Plan-Do-Check-Act) cycle, originally developed by Walter Shewhart and popularized by Edward Deming in the 1950s, and thus in practice may be complemented with the two remaining stages. Although the proposed approach is general, our focus will be on cognitive biases in PPPs.

Step 1: Identify cognitive bias

Given the discussion of cognitive biases in the previous section our aim here is modest. First, we give examples of biases that are important for PPPs in general, and subsequently discuss a number of biases that more specifically relate to either of the aforementioned challenges separately. Second, we briefly discuss factors specific to PPPs that potentially determine the strength of certain cognitive biases.

Biases appear to differ in terms of ecological validity. Some biases, e.g., optimism bias, hold up well outside the artificial confines of a laboratory experiment (Kahneman, 2011b), whereas others do not. Indeed, one may question supposed violations of rationality, and may wonder how it can even occur in principle, if rationality is to be understood as an idealization of actual human behavior—behavior that has evolved in a complex, dynamic environment and thus can be expected to be adaptive. Along these lines several researchers have appealed to linguistic approaches and the broader communicational context of decision making to show that seemingly irrational behavior may in fact be very reasonable (e.g., McKenzie, 2004). However, this is unlikely to dispel all quirks of the human mind (e.g., van Buiten & Keren, 2009). A full treatment of this discussion, sometimes referred to as the great rationality debate (see e.g., Stanovich & West, 2000), clearly falls outside the scope of this paper. We simply note that arguments relying on biological evolution sometimes fail to incorporate the notion that evolution does not necessarily generate optimal adaptation, but it merely results in an adequate fit to a specific environment (e.g., Hilbert, 2012) which thus does not preclude distorted judgment and decision making.

What is important for present purposes is that research should focus on biases that are most likely to occur in natural PPP settings. This entails, among others things, clearly demarcating the decisional setting in terms used to delineate various pockets of research, e.g., individual vs. group JDM, and interactive vs. non-interactive JDM. In general, cognitive bias is not limited to the individual or to non-interactive settings, but also manifests itself in group settings and in judgments and decisions that are made repeatedly rather than only once. However, research has shown that the prevalence of specific biases varies across the mentioned factors (e.g., Charness et al., 2010; Kugler, Kausel, & Kocher, 2012).

In general, a long list of biases and phenomena in risk perception and time discounting are of importance to PPPs. After all, PPPs are ultimately about the distribution of risks across its members for the duration of the project. As discussed, the JDM literature reveals some of the limitations of the human mind that prevent accurate risk assessment. The biases mentioned by Bazerman and Moore (2009) categorized under the representativeness heuristic (Table 1), including the already mentioned conjunction fallacy (see Linda problem), are particularly relevant in this regard. Relatedly, the conjunctive and disjunctive events bias may constitute distortions of managerial risk assessments. People typically overestimate the probability that, for example, seven events of 90% probability will all occur, whereas they underestimate the likelihood that at least one of seven events of 10% probability will occur (Tversky & Kahneman,
1974). In other words, people would rather bet on the conjunctive event (.48 probability) than on a fair coin toss (.50 probability), but prefer the coin toss to the disjunctive event (.52 probability). These and related biases thus contribute to sub-optimal investment decisions, thereby hurting PPP performance.

Many studies have also shown that people do not consistently discount future outcomes (Frederick, Loewenstein, & O’Donoghue, 2002; Soman et al., 2005). A small-but-early reward (e.g., €100 now) is typically preferred to a larger-but-later reward (e.g., €110 in 1 year) if offered immediately, whereas this preference reverses when a delay is added (e.g., €100 in 4 years and €110 in 5 years). This dynamic inconsistency, i.e., preferring the larger-but-later reward in the distant future, but preferring the small-but-early reward as time progresses, is often referred to as hyperbolic discounting, or non-exponential discounting more generally. Relatedly, certain money-for-effort transactions that appear attractive in the future are less appealing when imminent (Soman & Liu, 2010). For example, as a future prospect, a well-paying but effortful job is often preferred to a job that pays less but is also easier. However, the latter job is often preferred at present.

Dynamic inconsistency is troublesome for PPPs where decisions have to be made well in advance (both within the organization as with the other members of the PPP). An agreed-upon distribution of tasks among PPP-members that seemed appealing in advance might look substantially less appealing as the starting date of the task comes closer.

Certain biases might contribute more specifically to the across-boundary challenge. As the across-boundary challenge pertains to efforts to merge different groups of people and different working routines, certain social and stability biases (Table 2) seem especially relevant. For example, the status quo bias describes people’s unreasonable tendency to remain at the status quo. From the perspective of PPPs, the status quo bias implies a resistance to change old behaviors and adopt to the new inter-organizational collaboration consistent with Hartmann and Bresnen (2011).

The occurrence and prominence of biases themselves can be expected to depend on the specifics of the domain of inquiry. In JDM research, attention to these situational (or contextual) and individual factors has significantly increased over time and many have been found to moderate cognitive bias (e.g., Weber & Johnson, 2009). Individual factors, such as personality traits or cognitive ability, are discussed at length by Appelt, Milch, Handgraaf, and Weber (2011). Often, the measurement of individual differences involves lengthy questionnaires, but ‘short-and-cute’ assessments are also available (e.g., Frederick, 2005). PPP-specific factors are the natural equivalents of individual factors. A PPP-specific factor that may be of considerable interest is partner asymmetry. Specifically, PPPs are typically collaborations between a relatively
large monopolist public sector party and smaller private sector parties. We speculate that the degree of this imbalance may exacerbate certain biases exhibited by public officials (e.g., the overconfidence bias). Situational factors of potential interest include task complexity, imposed (legal) default choice options, framing, and many more.

Stipulating that cognitive biases should be identified is, unfortunately, easier said than done. Identifying your own cognitive biases is an especially daunting task (Kahneman, Lovallo, & Sibony, 2011; Pronin, Lin, & Ross, 2002).

Step 2: Assess avoidable economic loss

It should be realized that the goal should not be to minimize cognitive bias per se. Rather, focus should be on minimizing avoidable economic losses that stem from cognitive bias. This is a simple observation that is easily overlooked when studying the literature. The analysis boils down to a cost-benefit analysis where the benefits of managerial intervention (i.e., preventing economic losses that stem from cognitive biases) should be weighed against its costs. This entails, firstly, assessing the potential size of these losses based on the insights gained in step 1.

Second, the potential for managerial intervention should be assessed. Some biases may be easier to manage than others, and some might be impossible to manage effectively either in principle or because people resist (especially formal quantitative) intervention (Larrick, 2004).

Lastly, the costs of interventions that are deemed possible should be made explicit.

Step 3: Perform managerial de- or rebias

Ultimately, the research of many decision researchers is arguably aimed at improving choice behavior. Using common jargon, prescriptive decision making strategies should be employed to close the gap between normative standards and descriptive behavior. The JDM literature, and more applied engineering literatures (e.g., Arnott, 2006; Cleaves, 1987; Stacy & Macmillian, 1995), suggest many ways of coping with cognitive bias. For example, Kahneman et al. (2011) formulate twelve questions to confront potential bias. A fairly comprehensive approach based on the Lewin-Schein model of social change (Lewin, 1947; Schein, 1962) can be found in Bazerman and Moore (2009). The approach subsumes insights from various sources including formal decision-analysis, Fischhoff’s research on debiasing (Fischhoff, 1982), and Larrick’s review (Larrick, 2004). Six complementary strategies are discussed, i.e., the use decision-analysis tools, acquiring expertise, debiasing your judgment, analogical reasoning, taking an outsider’s view, and understanding biases in others. The overarching logic of the approach presented in Bazerman and Moore (2009) is to unfreeze, change, and subsequently refreeze your intuitive judgment processes by all available means. The reader is referred to the original text for specific techniques.

Many debiasing techniques are procedural in nature and do not require one to address the underlying structure of bias. However, depending on the situation, techniques are called for that may either be more (i.e., structure modifying debiasing) or less (i.e., rebiasing) rigorous.

Structure modifying debiasing techniques tackle biases at their core and may be preferable in terms of generalizability and effectiveness (Keren, 1990). However, the scope of these debiasing techniques seems somewhat limited. There are limits to the extent that we can truly debias ourselves, as experience offers little if any help to recognize biases (Kahneman, 2011a; Kahneman et al., 2011). Moreover, even if structure modifying debiasing is possible, benefits will often not exceed costs.

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Rather than either form of debiasing, it may be useful to focus on rebiasing (Larrick, 2004; Soman & Liu, 2010). Rebiasing does not entail correcting bias, but effectively offsets it by another counteracting bias. Changing default choice alternatives, for example, can be an effective rebiasing strategy (also see Thaler & Benartzi, 2004). To deal with cognitive bias, attention can be given to the entire ‘choice architecture’, i.e., the context of decision making that molds choice behavior (Thaler & Sunstein, 2008).

The interested reader is referred to Larrick (2004) who provides valuable material mainly on procedural debiasing in terms of motivational (incentives, accountability), cognitive (“consider the opposite”, training in rules, training in representations, training in biases), and technological (group decision making, formal and computerized decision analysis) techniques. In a related paper a general strategy of broadening the decision frame is advocated by using several formal (e.g., multi-attribute decision making methods) and informal techniques (Larrick, 2009). Table 1 in Soman and Liu (2010) contains a brief literature review of both debiasing and rebiasing intervention strategies for a number of well-known biases.

RESEARCH DESIGN

A case study design was chosen to explicate the role of biases in PPPs. The selected case is a PPP for road maintenance implemented through the Dutch Highways and Waterways Agency, the executive arm of the Dutch Ministry of Transport. The agency is responsible for managing 4,474 kilometers of carriageways, 90,278 square kilometers of surface water, and 2,137 km of canals and rivers in the Netherlands. In the last few years the agency has established new procurement strategies for asset management on its way to become a professional public-oriented network manager. The case comprises the first application of a new form of public-private collaboration for the management of road infrastructure in the Netherlands. Under the terms of the collaboration, the Dutch maintenance contractor assumes responsibility for maintenance operations for the entire network of national roads in the province of Zeeland.

Data collection and analysis

We used data from an interim evaluation study that aimed to assess the partnership’s successes and points for improvement. As part of the evaluation, thirteen team members from both organizations filled out a questionnaire that covered aspects related to contracting goals, elements of the contract, instruments, collaboration, successes and opportunities for improvement. Subsequently, semi-structured interviews were conducted with team members to collect further details about the answers provided on the questionnaire. The interviews were transcribed and all interview transcripts were analyzed following a three-step procedure detailed below.
Table 3 Overview of executive decision making and biases from Kahneman et al. (2011)

<table>
<thead>
<tr>
<th>Bias</th>
<th>Questions to ask</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-interested biases</td>
<td>Is there any reason to suspect the team making the recommendation of errors motivated by self-interest?</td>
</tr>
<tr>
<td>Affect heuristic</td>
<td>Has the team fallen in love with its proposal thereby minimizing its risks and costs and exaggerating its benefits?</td>
</tr>
<tr>
<td>Groupthink</td>
<td>Were there dissenting opinions within the team and were they explored adequately?</td>
</tr>
<tr>
<td>Saliency bias</td>
<td>Could the diagnosis be overly influenced by an analogy to a memorable success?</td>
</tr>
<tr>
<td>Confirmation bias</td>
<td>Are credible alternatives included along with the recommendation so as not to get stuck seeking supporting evidence for one alternative?</td>
</tr>
<tr>
<td>Availability bias</td>
<td>If you had to make this decision again in a year's time, what information would you want, and can you get more of it now so as to avoid the WYSIATI (What You See Is All There Is) assumption?</td>
</tr>
<tr>
<td>Anchoring bias</td>
<td>Do you know where the numbers came from? Can there be unsubstantiated numbers, extrapolation from history, or a motivation to use a certain anchor?</td>
</tr>
<tr>
<td>Halo effect</td>
<td>Is the team assuming that a person, organization, or approach that is successful in one area will be just as successful in another?</td>
</tr>
<tr>
<td>Sunk-cost fallacy, endowment effect</td>
<td>Are the recommenders overly attached to a history of past decisions?</td>
</tr>
<tr>
<td>Overconfidence, planning fallacy, optimistic biases, competitor neglect</td>
<td>Is the base case overly optimistic?</td>
</tr>
<tr>
<td>Disaster neglect</td>
<td>Is the worst case bad enough?</td>
</tr>
<tr>
<td>Loss aversion</td>
<td>Is the recommending team overly cautious reflecting their stronger propensity to avoid losses than their desire for gains when contemplating risky decisions?</td>
</tr>
</tbody>
</table>

First, we performed a thematic analysis of the entire data set searching for signs of potential biases and their effects on partnership performance. These could pertain to the specific individual being interviewed as well as others on which the interviewee was commenting. Preset and emergent categories were used for coding. The preset categories were biases discussed by Kahneman et al. (2011). These biases are believed to be especially important for executive decision making in which a project team is solicited for input by the executive with formal decision making authority. Although not identical to construction partnerships, it shares some features, most importantly the duality of a principal-agent relationship. Table 3 lists the biases and example questions management executives should ask.
Second, to limit possible adverse influences from our own cognitive limitations, independent raters assessed the interview transcripts. Specifically, student groups judged the transcripts as part of a course assignment on performance-based contracts in infrastructure management. Students were required to read Kahneman et al. (2011) and Hammond et al. (2006). Pairs of transcripts (one public agency employee transcript and one contractor employee transcript) were assigned to eight student groups each consisting of three students. This approach gave students some insight into both public agency as well as contractor views. Importantly, it also ensured that all transcripts received an independent assessment by at least one student group.

Finally, we identified commonalities and discrepancies between assessments and distilled a final coding.

Findings

The results of our analysis are summarized in Table 4 and elaborated below. We focus on biases that appear most prevalent.

Affect heuristic

Our analysis of interview transcripts reveals an almost universal and uncritical endorsement of the market utilization view among project members, at least at the very start of the project. Many believe, or at least did believe at some point, that substantial efficiency gains can be realized by transferring responsibility from public to private parties. This is especially prominent among employees of the Dutch Highways and Waterways Agency. To a great extent this is likely to reflect the affect heuristic at work which results in an overly rosy view of potential net benefits. And indeed, as a consequence, many express some disillusionment about the results that were realized up to the moment of evaluation.

Overconfidence bias

Relatedly, project estimates (e.g., time schedule) turned out to be overly optimistic. This is a well-known phenomenon and has been attributed to people’s susceptibility to optimism biases such as the overconfidence bias and planning fallacy. The failure to meet goals and deadlines can quickly become a major source of frustration.

Self-interested biases

There is ample scope for self-interested biases in which self-serving actions can harm project performance. This does not need to reflect malicious intent, but simply a failure to keep interests in clear view and manage them adequately. For example, the public agency appears to have misinterpreted a key document (i.e., PKP) provided by the contractor precisely for this reason. As a result, public agency employees have become distrustful of the contractor. Commenting on the PKP, one employee of the public agency noted that “the most important element you need for collaboration, i.e., trust, is just not there”.

Relatedly, assessments of project performance by employees of the contractor need to be viewed in light of the upcoming decision about contract renewal.
In-group/out-group bias

Another factor detrimental to the Dutch partnership has been groupthink and in-group / out-group bias. Interview transcripts contain several examples of neglectful, disrespectful or even dismissive attitude towards the partner thereby hindering fruitful collaboration.

Status-quo bias

Even more clearly reflected in people’s utterances is the status quo bias according to which people inflexibly try to hold on to the current state of affairs without good reason. This is a key inhibitor of necessary change. The Dutch collaboration constituted a major break with the past in terms of day-to-day operations and general mindset. Transitioning towards new practices has proved to be difficult.

Framing effects

Finally, framing appears to have been an issue in the Dutch collaboration, as it is in any communicational setting. In particular, the project lacked clear definitions of key terms and consequently suffered from differences in interpretations and misconstrued implications of formulations.

<table>
<thead>
<tr>
<th>Table 4 Case study: evaluation of the PPP between the Dutch Highways and Waterways Agency and a Dutch maintenance contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affect heuristic</strong></td>
</tr>
<tr>
<td><strong>General</strong></td>
</tr>
<tr>
<td><strong>In PPP</strong></td>
</tr>
<tr>
<td><strong>Likely consequence(s) in PPP</strong></td>
</tr>
<tr>
<td><strong>Managerial implications (questions to ask)</strong></td>
</tr>
<tr>
<td><strong>Illustrative quotes</strong></td>
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</table>

### Overconfidence bias and related optimism biases (e.g., planning fallacy)

| General | Tendency to have (subjective) confidence in judgments that is reliably greater than its (objective) accuracy |
|---|
| In PPP | An overly optimistic assessment of the base case scenario (project estimates) of the |
construction partnering project (including its time schedule)

<table>
<thead>
<tr>
<th>Likely consequence(s) in PPP</th>
<th>Failure to meet goals and deadlines; disappointment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial implications (questions to ask)</td>
<td>Is the base case overly optimistic?</td>
</tr>
<tr>
<td>Illustrative quotes</td>
<td>“… what I notice about people at the Dutch Highways and Waterways Agency is that they seem to think that collaboration happens automatically.” (employee Dutch maintenance contractor)</td>
</tr>
<tr>
<td></td>
<td>“I initially had the impression that we could remodel those people, but I had to reassess these views.” (employee Dutch Highways and Waterways Agency)</td>
</tr>
<tr>
<td></td>
<td>“But the tasks that they supposed to take off our hands … falls a bit behind expectations.” (employee Dutch Highways and Waterways Agency)</td>
</tr>
</tbody>
</table>

**Self-interested biases**

<table>
<thead>
<tr>
<th>General</th>
<th>Tendency to hold views or seek outcomes favorable to oneself or one’s unit at the expense of the interest of the overarching project</th>
</tr>
</thead>
<tbody>
<tr>
<td>In PPP</td>
<td>A (distorted) self-serving view held by one or more of the partners about some aspect of the construction partnering project</td>
</tr>
<tr>
<td>Likely consequence(s) in PPP</td>
<td>Creation of false views and expectations</td>
</tr>
<tr>
<td>Managerial implications (questions to ask)</td>
<td>Is there any reason to suspect project team members making the recommendation of errors motivated by self-interest?</td>
</tr>
<tr>
<td>Illustrative quotes</td>
<td>“The PKP is what they promised us. The agreement, the impression they gave us … In a recent meeting, which is on record, they admitted that it was just a lot of hot air.” (employee Dutch Highways and Waterways Agency)</td>
</tr>
<tr>
<td></td>
<td>“Interviewer: I’m not sure the question was entirely clear. I meant to ask about how important is it …uhm Employee: For us… Interviewer: … for the project.” (interviewer and employee Dutch Highways and Waterways Agency)</td>
</tr>
<tr>
<td></td>
<td>“Then I indeed say … yes it is always a battle. It is always a discussion. It is always about money. In the end it almost never about the actual work.” (employee Dutch Highways and Waterways Agency)</td>
</tr>
</tbody>
</table>

**Groupthink and in-group / out-group bias**

<table>
<thead>
<tr>
<th>General</th>
<th>Tendency to strive for consensus at the cost of a realistic appraisal of alternative courses of action raised by dissident voices, including favoring members of one’s in-group over out-group members</th>
</tr>
</thead>
<tbody>
<tr>
<td>In PPP</td>
<td>A view that is neglectful, distrustful or even dismissive towards initiatives and views from the partner (or other out-group within the own organization) and the situation he is in</td>
</tr>
</tbody>
</table>
**Likely consequence(s) in PPP**

- Failure to collaborate

**Managerial implications (questions to ask)**

- Were there dissenting opinions within the project and were they explored adequately?

**Illustrative quotes**

- “...we are not sensitive to the interests of the contractor and we do not trust them.”
  (employee Dutch Highways and Waterways Agency)

- “So there will be moments that people will feel it has gone too far; this is not the way we treat each other. But instead of confronting each other, they will keep their mouth shut... It quickly becomes a matter of 'if that is your opinion and this is mine, then we will simply not discuss it anymore'.“
  (employee Dutch maintenance contractor)

- “…the contractor does his thing and thinks ‘I will stick to the contract and will try to learn from this experience myself’, and the Dutch Highways and Waterways Agency is the other entity that is occupied only with trying to show that the contractor fails to deliver on his promises. They are two ships that, well, they are just in each other’s way.”
  (employee Dutch Highways and Waterways Agency)

**Status quo bias and endowment effect**

| General | Tendency to be overly attached to what already is or what one already has |
| In PPP | A view that stubbornly insists on continuing current practices within the construction partnering project |
| Likely consequence(s) in PPP | Sub-optimal practices and lack of innovation |
| Managerial implications (questions to ask) | Are project team members overly attached to a history of past decisions? |

**Illustrative quotes**

- “And often you see that people have this image in their head about a situation; and that image must be correct because I have 20 years of experience, and now he tells me that things are different.”
  (employee Dutch maintenance contractor)

- “It is of course very easy to slip into old behavior, and it is very hard to change direction with unknowns, with uncertainties, with people that have to perform other tasks overnight, who cannot continue doing the tasks they have done for years.”
  (employee Dutch maintenance contractor)

- “Both sides have this picture in their heads about how things are supposed to go. This is discussed, but certainly at the operational level people keep holding onto the same old ideas ... at the operational level things are the same as they have always been...
  Existing structures are very hard to break…”
  (employee Dutch maintenance contractor)

**Framing effects**

| General | Tendency for assessments to be dependent on the phrasing and format of message information rather than depend solely on actual content |
| In PPP | A view that neglects the impact of message format in the exchange of information between partners in the project |
Likely consequence(s) in PPP

Misconstrued implications in communications between partners

Managerial implications (questions to ask)

Does reformulating the message change the assessment of the content? i.e., what does it actually say?

Illustrative quotes

“This morning we again had a discussion about the definition of “failure”. Then you think ‘guys, it’s been three years now, and still we have discussions about these sort of descriptions.” (employee Dutch Highways and Waterways Agency)

“You are inclined to go by first impressions, for example about the way a contractor describes his processes... There were contractors that had very nice tables ... There was one that had a very messy display ... But certainly when you start evaluating the PKP, then people can write up very beautiful stories, but then it becomes a matter to what extent can you see through these things.” (employee Dutch Highways and Waterways Agency)

“You should not forget that it is a document based on a commercial assessment; how you write things up and how you display certain things.” (employee Dutch maintenance contractor)

Conclusion

The interview transcripts contain many passages that are interesting from a JDM perspective. We make no claim that highlighted interview statements are necessarily indicative of bias. Nor can one generalize from a case study. We do believe, however, that our analysis at least suggests that biases in decision making are likely to be ubiquitous in construction collaborations and, indeed, important determinants of project failure. Our analysis, invoking a JDM perspective, helps to flag issues that require attention from management. Only further analysis can reveal whether or not distorted judgment and decision making adversely affected partnership performance. Preferably, of course, biases are dealt with in PPP design from its early conception.

DISCUSSION AND CONCLUSION

Various approaches to the study of human decision making such as decision analysis, game theory, and negotiation theory can shed light on the functioning of PPPs in construction. In this paper we have emphasized the importance of the judgment and decision making literature (or sometimes referred to as behavioral decision making) for construction management in general and PPPs in particular.

Consistent with recent research (Hartmann & Bresnen, 2011) we suggest that a main stumbling block on the road towards successful partnerships is the persistence of old routines and behaviors. Rules-of-thumb that have been effectively employed in the past may no longer be appropriate at present. In part, these rules-of-thumb are rooted in the individual minds of everyone involved in PPPs. In other words—borrowing terminology from JDM—practitioners employ heuristics that, although often quite successful, sometimes lead them astray.

Our discussion of cognitive biases in PPPs very naturally suggests testable propositions for future research on PPPs, such as “All else equal, the more asymmetric the partners in PPPs, the more likely strategic level managers of the dominant organization will display the planning
fallacy”, and “All else equal, the more pronounced the planning fallacy at the strategic level, the more likely a divergence between strategic level goals and operational level realities.”

Although we offer no comprehensive classification of biases, we would like to provide an integrative view of cognitive bias based on two observations about decision making. First, decision making is inherently comparative. The assessment of a choice alternative involves stacking it up against various reference points ranging from competing alternatives under consideration and other cues from context (i.e., external reference points), to information retrieved from memory (i.e., internal reference points). Second, decision making is ultimately about selection. There would be no decision making if one could simply have it all.

In our view, many cognitive biases can be traced to a premature narrowing of focus that hampers the comparative process of decision making (relatedly see chapter 3 in Bazerman & Moore, 2009; Larrick, 2009). Baron (2008) similarly identifies a lack of active open-mindedness as a main problem in JDM. Cognitive, affective and motivational processes, moderated by situational and individual-specific factors, may give rise to narrow focusing. Much research has focused on cognitive processes involved in the acquisition, storage, transformation, and use of information, i.e., the information-processing perspective (Weber & Johnson, 2009). This research shows how narrow focusing can involve our sensory register (attention and perception), and the interplay between long-term memory (storage of information) and short-term/working memory (encoding and transfer to long-term memory, recall from long-term memory, and analysis of information). Although in the end choice involves selection, a premature narrowing of focus distorts the reference context which sends the decision maker down the wrong path (i.e., path-dependency) and in effect prevents the decision maker to do the right things and doing them right.

To be sure, we do not advocate a “more thinking is always better” view of decision making. In fact, research has shown instances where thinking less is better (Ariely & Norton, 2011). We would argue, however, that these instances typically stem from a wrongheaded narrow focus on analytical aspects when other more subjective aspects are more important (also see Larrick, 2009, pp. 474, 475). As such, thinking too much should not be equated with an excessively broad scope, but rather it should be regarded as a manifestation of narrow focusing. For example, Wilson et al. (1993) showed that students choosing a poster for their dorm or apartment were generally happier when they chose without deliberation than when they were instructed to list reasons for their decision. As the authors note, post-decisional satisfaction may well stem from a mistaken focus on attributes that are of little importance but easy to articulate (e.g., size or color), whereas focus should have been on the more important, but harder to articulate attributes.

This brings us to a possible objection against our line of inquiry, namely that it is unlikely that cognitive biases are problematic for PPPs when decision making procedures are highly standardized and formalized. We would like to point out that a standardized, formalized procedure has no a priori status as a necessary or sufficient condition for bias-free decision making. Indeed, the results by Wilson et al. (1993) suggest that it might be detrimental to performance when a formalized procedure is applied blindly to all decision problems. It can effectively lock-in problems.

The question is not whether cognitive biases exists in PPPs, but rather which biases are prevalent under certain conditions, and if appropriate measures have been taken to remove or offset these biases. As we have argued, the managerial decision to apply techniques aimed at neutralizing the effects of cognitive biases should be guided by a cost-benefit analysis that
weighs the costs of intervention against the benefits of improved performance. Resulting intervention may take the form of very fundamental structure-modifying debiasing, procedural debiasing, or mere rebiasing. This is, we believe, a fairly comprehensive characterization of intervention techniques as this distinction roughly translates into “fixing” cognition, “fixing” decisional context, and manipulating cognition or context, thereby covering the entire range of feasible possibilities (leaving aside the theoretically intriguing but practically complicated option of trying to fix people’s emotional regulation).

Of course, we realize that not all the problems vexing PPPs are the result of cognitive bias. In fact, many problems might even stem from very rational behavior. It is well-known that rational (i.e., bias-free) pursuit of self-interest can lead to sub-optimal outcomes at the aggregate level. Research on social dilemma’s, such as the prisoner’s dilemma or the tragedy of the commons, clearly illustrate this point. Nonetheless, cognitive bias can compound problems in PPPs.

Others have also started to recognize the relevance of decision research for construction management. For example, Klotz notes that ‘decisions […] appear systematically irrational, not maximizing utility for designers, occupants, or society” (Klotz, 2011, p. 271) and he calls for active involvement of decision researchers. At the same time, decision researchers are eager to increase the practical relevance of their field by contributing to (theorizing on) strategic (public) management (e.g., Powell, Lovallo, & Fox, 2011; Weber & Johnson, 2009, p. 78, future issue number 5). We hope this paper serves as an impetus for future research merging insights from decision research and construction management.

REFERENCES


For an idiosyncratic view on the descriptive status of "economic man" (and economics more generally) see Rubinstein (2006).

Confronted with the outbreak of a disease that puts 600 lives at stake, people prefer to implement a program that saves 200 people rather than gambling with a program that has a one-third probability to save all 600 people, but also has a two-third probability that no one will be saved. Alternatively, a program with a one-third probability that nobody dies and two-third probability that 600 people die tends to be preferred over a program that results in the deaths of 400 people.

Participants in this experiment were told about a fictional woman named Linda. She supposedly was 31 years old, single, outspoken, very bright, had majored in philosophy, and as a student was deeply concerned with issues of discrimination and social justice. Participants found it more likely that Linda would be a bank teller also active in the feminist movement than that she would (merely) be a bank teller. Of course, the conjunction of two events (bank teller and active feminist) can never be more likely than either event alone (but see e.g., Camerer, 1995, p. 598; Charness et al., 2010).

Kahneman has always likened cognitive biases with visual illusions in that they remain compelling even when one knows they are false (e.g., Kahneman, 2011a).

Although this account certainly has some superficial appeal, it is not without its critics (Keren & Schul, 2009).

Further, gains are typically discounted more than losses (i.e., sign effect), small amounts are discounted more than large amounts (i.e., magnitude effect), greater discounting occurs to avoid delay of outcomes than to expedite them (i.e., direction effect), discounting is smaller for larger delays (i.e., delay effect), and larger time intervals between two outcomes lead to smaller discount rates (i.e., interval effect) (Soman et al., 2005, p. 350).

Samuelson and Zeckhauser (1988) devised a hypothetical choice task requiring participants to invest in certain bills and bonds. In the neutral choice task participants had supposedly just received a cash inheritance from a great-uncle which they had to invest. In contrast, other participants were told they received an inheritance containing money and an investment portfolio, and were similarly asked to make the investment decision. The choice task in the latter group thus comes with a status quo, namely money already invested in a portfolio. Results showed that an investment alternative is deemed substantially more attractive when it is the status quo compared to when it is merely one of the contenders, and even more so when the number of alternatives increase.

Note that qualitative data analysis is not intended to generalize across a population. Rather qualitative data analysis concentrates on the specific perspective of the respondents. Narrative data provides clarification and hopefully understanding and explanation (Taylor-Powell & Renner, 2003).