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Global Cooperation and the Human Factor in International Relations

Edited by Dirk Messner and Silke Weinlich

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6 Can we think of the future?

Cognitive barriers to future-oriented decision making

Elke U. Weber and Eric J. Johnson

Introduction

Planning for the future is an ever more necessary requirement for the continued survival and long-term well-being of the human species, as is local and global cooperation to implement such plans. Yet resource depletion, species depletion in both flora and fauna, threats of catastrophic climate change, and extreme weather – to name only a few ways in which we are inflicting potentially irreversible damage on crucial ecosystems – indicate that the human ability to plan and coordinate for tomorrow may be severely limited and may indeed become outpaced by the speed of technological innovation and globalization of production and commerce. Whereas previous chapters in this book have described the evolutionary pressures for cooperation and the many forces that contribute to its emergence and success, this chapter will provide a counterweight to that position and argue that there are also many obstacles to cooperation.

A 'glass-half-full' perspective suggests that human evolution towards our current ability to cooperate is remarkable, as indeed it is. The 'glass-half-empty' perspective of this chapter suggests that our ability to cooperate may be adequate to solve the types of problems typical of the time and environment under which this ability evolved, but that the complexity and timescale of current individual as well as societal challenges severely challenge the human ability for cooperative and proactive problem solving. The names of common economic games that exemplify cooperation tasks (e.g. 'battle of the sexes', 'stag hunt') describe stylized settings for cooperation or competition that involve a small number of players and well-specified, riskless outcomes that become available to the contestants immediately. The proverbial 'real world' of course rarely comes in such simplicity.

Games like the 'Prisoner's Dilemma' have been devised with nation states as actors in mind, for example to model the Cold War of the 1950s. However, instances in which rational selection of the individually and socially worst option are the only Nash equilibrium, the *tragedy* of the commons (Hardin 1968) can be turned into a mere *drama* of the commons, where cooperation may be difficult but often prevails (Ostrom et al. 2002) and tends to be found primarily in smaller contexts, where individual actors or small collectives know each other and have repeated interactions. It is in precisely such settings that the factors of the cooperation hexagon (e.g. we-identity, trust, communication, reputation; Messner, Guarín, and Haun in this volume) allow for cooperation can emerge.

We first review insights from psychology and behavioral economics on the way people actually make decisions (as opposed to the rational-economic view of how such decisions ought to be made and thus are assumed to be made), and describe the cognitive and motivational processes and constraints that prevent us from keeping the future on our processing horizon in the way rational models suggest. We then apply these insights more specifically to strategic decisions and describe obstacles that limit our ability to arrive at cooperative plans to ensure our future well-being. We conclude with a discussion on how to translate the actual decision processes of *homo sapiens* from liabilities into opportunities with the design of decision environments ('choice architecture') that increase the chances for cooperative decisions.

Insights from psychology and behavioral economics

Bounded rationality

Homo economicus – the rational decision maker who maximizes expected utility by evaluating all available choice options for all present and future consequences, appropriately discounted to present value with perfect information and infinite processing capacity – is at best a convenient fiction or aspiration (Weber 2013). *Homo sapiens* has the ability (i.e. the 'hardware') for rational deliberation and choice and rational updating of beliefs based on new information, but such processes need to be taught explicitly (i.e. the 'software' needs to be programmed). Even when such processes are in play, they are frequently overridden by automatic and faster processes that use shortcuts based on associations, emotions, and rules to arrive at judgments and decisions (Kahneman 2011; Marx et al. 2007; Weber and Lindemann 2007). The need for such cognitive shortcuts originates in people's attention and information processing limitations, often referred to as bounded rationality (Simon 1982).

Behavioral decision research shows that humans often construct their preferences while making their decisions, using processes that are typically different from the as-if calculations implicitly assumed by rational-economic models of choice (Lichtenstein and Slovic 2006), as described in the next section. As already discussed, choices are not purely deliberative but also involve automatic inference and decision processes of which people are unaware. These processes are elicited by features and conditions in the external environment that interact with internal states such as prior experience, expectations, and goals (Engel and Weber 2007; Weber and Johnson 2012).

In addition, choices do not follow purely from the valuation of choice options (i.e. choosing the one with the highest subjective value), but also involve temptation from prepotent response options, i.e. options, like immediate rewards, that are hardwired to be favored (ceteris paribus) and that require willpower and self-control to be overridden (Figner et al. 2010).

Preferences are constructed

Contrary to the assumptions of rational-economic models of choice, preferences are typically not preexisting and constant across contexts, but instead are constructed in real time at the time of decision, making them responsive to the choice context (Weber and Johnson 2009). This can be seen either as a liability (e.g. leading to inconsistency and preference reversals; Grether and Plott 1979) or as an asset (e.g. allowing preferences to be shaped and influenced; Thaler and Sunstein 2008).

Cognitive myopia

Given that attention and processing capacity are scarce, they need to be allocated wisely and strategically. With immediate survival being a necessary condition for achieving more distant and abstract goals (Maslow 1943), goals and constraints that are immediate in both time (now vs. later) and social distance (me vs. close others vs. distant others) tend to take precedence over more distant ones. The reinforcement of attention to immediate goals and constraints at the individual and cultural level sets up mechanisms that result in prepotent responses, i.e. responses that are being favored, all other things being equal, by attention or processing capacity being disproportionally allocated to them. The result is a type of cognitive myopia or shortsightedness that has been used to explain many real-world phenomena, including the equity premium puzzle in finance, i.e. the puzzling fact that investors hold bonds to the degree that they do given that the returns on stocks are significantly larger, albeit risky. The behavior, which is inconsistent with reasonable assumptions about risk aversion, can be explained by the assumption that investors do not apply sufficiently long-time horizons to their investment decisions, but instead compare and contrast the outcomes of risk-free and risky investment opportunities on a quarterly basis and get disproportionately agitated by losses (Benartzi and Thaler 1995).

Cognitive myopia prevents people from accurately perceiving the future benefits of a wide range of other actions that have immediate costs or reduce immediate benefits. Thus people fail to buy more energy-efficient appliances or a host of other energy-efficiency investments whose greater upfront purchase costs are more than compensated by future energy savings (Gillingham, Newell, and Palmer 2009). In negotiation settings, people favor immediate gains at great costs to their reputations (Malhotra and Bazerman 2007).

Status quo bias

Cognitive myopia also focuses attention on actions or regimes that are in place, at the cost of considering available alternatives that may increase individual or public welfare (Weber and Johnson 2009). This gives rise to a widely observed status quo bias (Samuelson and Zeckhauser 1988) that has been shown to influence consequential financial (Johnson et al. 1993; Kempf and Ruenzi 2006) and social decisions like organ donation (Johnson and Goldstein

2003). Public policy interventions and their implementation can be seen as the process of shifting an established status quo towards a legislated or incentivized new state perceived as preferable by domain experts using analytic assessment tools not subject to status quo bias (Weber 2015). We will revisit how judicious choice architecture can help overcome status quo bias at the end of the chapter.

Large and inconsistent time discounting

Future costs and benefits ought to be discounted in value (e.g. by the current rate of interest offered by banks), ideally at a constant rate per period of time delay, described by an exponential discount function. Empirical research shows, however, that people apply sharp discounts to costs or benefits that will occur at some point in the future relative to obtaining them immediately (e.g. a year into the future vs. now), but discount much less when both time points are in the future, with one occurring later than the other (e.g. two vs. only one year into the future) (Loewenstein and Elster 1992). Such behavior has been described by a hyperbolic discount function, which shows its steepest decrement in value as we defer immediate consumption (Ainslie 1975).

The discount rates implicit in both financially incentivized lab studies (Weber et al. 2007) and real-world decisions (Meier and Sprenger 2010) are often far larger than current interest rates, a result that is consistent with the existence of societal problems like the current obesity epidemic in the US and other countries, the popularity of balloon mortgages during the recent US subprime mortgage crisis, insufficient pension savings in countries that do not mandate such savings, and a general unwillingness by individuals, organizations, and governments to engage in environmental preservation and damage prevention. Actions to mitigate negative environmental consequences are unattractive because they require immediate sacrifices in consumption that are compensated only by heavily discounted and highly uncertain benefits at a much later point in time.

Cognitive myopia and excessive discounting are arguably the biggest hurdles to rational choice in individual, organizational, or societal decisions that involve long-term planning and consequences that occur over extended periods of time. Contrary to economic discounting of future and distant costs and benefits (e.g. by the rate of interest offered by financial institutions) as a function of the time delay, people are inconsistent in their discounting. They show a strong present bias (i.e. strongly preferring immediate benefits), as described earlier. They also apply different discount rates to outcomes in different domains (e.g. financial, health, or environmental outcomes; Hardisty and Weber 2009), and discount future benefits far more than future costs (Gong, Krantz, and Weber 2014; Hardisty, Appelt, and Weber 2013).

Egocentric biases

Shortsightedness is not restricted to time, but extends to other dimensions. It explains a variety of egocentric biases (Plous 1993a), where people use their own perceptions and reactions as a starting point when trying to predict the behavior of others, and where myopia prevents them from adjusting sufficiently for differences between themselves and others. Such egocentric biases become relevant in strategic situations, described further in the following section, where they result in an incomplete search of the decision space.

Query theory

Query theory (Johnson, Häubl, and Keinan 2007; Weber et al. 2007) is a framework that incorporates attentional limitations and a role for past experience into preference construction. Query theory conceives of preference construction and choice as an automatic and unconscious process of arguing with oneself (Weber and Johnson 2011), where people sequentially generate arguments for selecting each of the different choice options and where the first option considered has a large advantage, all other things being equal. In the context of an intertemporal choice, where the decision maker must select between an immediate benefit or a larger benefit at a future point in time, query theory assumes that people first assess the evidence arguing for immediate consumption and only then assess evidence that argues for delaying consumption. Query theory postulates that in order to help people reach a decision, evidence generated for an initially favored action (e.g. immediate consumption) tends to inhibit or reduce the subsequent generation of evidence arguing against that action and for other actions. Weber et al. (2007) provided empirical support for both conjectures. While it is true that in unaided decisions of this sort decision makers will initially search for reasons for the prepotent immediate choice option, the decision can be reframed in ways that direct initial attention to the delayed outcome choice option, e.g. by making the 'larger later' option the explicit default, i.e. the option that will be obtained if no active decision is made to switch away from it. Weber et al. (2007) show that this framing of the two choice options succeeds in drastically reducing decision makers' impatience, i.e. the discount rate applied to the later outcome implicit in their choices, and that this increase in patience and future orientation is mediated by the fact that they first generate evidence in favor of deferring consumption. Weber et al. (2007) succeeded in drastically reducing people's discounting of future rewards by prompting them to first generate arguments for deferring consumption, followed by a prompt to generate arguments for immediate consumption. Specifying a default option (i.e. an option that will be implemented unless a different option is actively selected) directs decision makers' attention to that option, getting them to consider arguments for this option first.

Other interventions that direct attention more equally to both the future and the present and that remind decision makers of the implicit tradeoff between time and money also succeed in reducing the discounting of future outcomes (Radu et al. 2011). One such intervention is the explicit (vs. hidden) zero framing of intertemporal choice options, which spells out that receipt of an immediate reward means that no future reward will be forthcoming (Magen, Dweck, and Gross 2008). Another intervention modifies the response methodology, asking respondents to distribute 100 tokens between the two intertemporal choice options, which will pay off at different rates and time points (rather than asking for one choice or the other), thus also directing attention more evenly to both choice options and making choices less impulsive and more dynamically consistent (Andreoni and Sprenger 2012).

Social norms and/or positive or negative affective reactions to a choice option also determine which option is considered first, especially in those situations where no default action exists (Johnson et al. 2007; Weber et al. 2007). Thus Hardisty, Johnson, and Weber (2010) found that 65 per cent of Republicans were willing to pay a CO_2 emission reduction fee on such purchases as airline tickets when the fee was labeled as a carbon offset (and first generated arguments for purchasing it), but that this percentage dropped to 27 per cent when the fee was labeled as a carbon tax, a label that generated negative visceral reactions in this group and led them to first generate arguments for purchasing a ticket without any carbon fee.

Lessons for strategic decisions

In this section we will examine the implications that insights from behavioral decision research on riskless and risky decisions have for strategic decisions, which are the focus of this book. Most behavioral decision research has focused on non-strategic decisions that involve only the evaluation of decision makers' own preferences for different choice options, with their risky or riskless resolutions. In contrast strategic choice is significantly more complex, as the outcomes of each decision maker's action depend also on the actions of his or her strategic opponent(s) or counterpart(s). This adds an important and difficult task, namely the prediction of the other side's preferences, which are in turn dependent on the opponents' evaluations of the first decision maker's preferences and choice.

Theories like prospect theory (Tversky and Kahneman 1992) provide behavioral 'band-aids' to the normative model for risky choice, namely expected utility theory (von Neumann and Morgenstern 1944), modifying it in parts to improve its fit to observed choice behavior. In this same way, behavioral game theory (Camerer 2003) generalizes and updates traditional game theory with more realistic assumptions about how strategic decision makers evaluate choice options and in the process anticipate the preferences and responses of their strategic opponent(s). There are three major assumptions of traditional non-cooperative game theory, namely about (1) the sole importance of the personal utility of the outcomes of joint actions and absence of other-regarding preferences, either positive or negative; (2) the absence of trust; and (3) the futility of communication, with any kind of verbal agreement or promise being described as unenforceable and hence untrustworthy 'cheap talk'. If these assumptions made by the normative model were behaviorally correct, this would knock most if not all of the components of the cooperation hexagon (Messner et al. in this volume) out of court, making them completely irrelevant to strategic decisions. Cooperation in strategic games only arises when groups of players may enforce cooperative behavior, and hence the game is a competition between coalitions of players rather than between individual players, thus building on the only component of the cooperation hexagon tenable within this normative game theory framework, namely 'enforcement'.

The balance of this book fortunately suggests, however, that these assumptions of the normative game-theoretical framework do not typically apply. As we will see in the remainder of this section, attentional limitations already encountered in the context of non-strategic decision making also play an important role in strategic decisions, and not necessarily always in detrimental ways – instead at times also contributing to more cooperative decisions and beneficial outcomes.

Failure to consider the actions of others

The first such instance where cognitive myopia may have a positive effect occurs in the context of the Prisoner's Dilemma, already mentioned earlier. In this game, two prisoners can each decide whether (a) to cooperate and deny all charges about their joint crime or (b) to defect and turn state witness, implicating his or her friend in the crime. The payoff matrix is such that mutual defection is the only Nash equilibrium (see Table 6.1). The tragedy of the situation is that this outcome is far inferior to the mutual cooperative choice, yet seems completely out of reach for rational decision makers (Hardin 1968). Many real-world resource utilization decisions have this payoff structure, often referred to as social dilemmas when the decision involves depletion of the resource (e.g. grass on the village commons, fish in the oceans) and as public goods dilemmas when the decision involves contribution to the resources (e.g. National Public Radio, blood bank reserves). In such situations, defection (involving either resource depletion or free-loading, i.e. resource use without contributions) tends to be the equilibrium choice. Fortunately, this is not always the dominant or even majority response observed in many real-world situations or lab experiments involving stylized, but often material, payoffs (Ostrom et al. 2002).

There are many reasons for this discrepancy between game theoretic predictions and observed responses (Attari, Krantz, and Weber 2014). One of them involves cognitive myopia, in this case resulting in a failure to realize that one is facing a strategic decision and treating it instead as a decision where only one's own action matters. This tendency to cut short the reasoning process about the best course of action by not considering the strategic element of these decisions, namely the consequences of the action of one's counterpart, was documented by the following study by Shafir and Tversky (1992). Participants in a single-round two-participant Prisoner's Dilemma game, seeing, for example, the payoff matrix in Table 6.1, were randomly assigned to one of three conditions. In the first

Table 6.1 Prisoner's Dilemma payoff matrix

"Prisoner's Dilemma/Arms Race"	***USSR** cooperates (unilaterally disarms)*	***USSR** defects (continues to arm)*
USSR cooperates (unilaterally disarms)	(2, 2)	(-8, 4)
USSR defects (continues to arm)	(4, -8)	(-6, -6)

condition they were told that their counterparts had decided to defect; in this condition 97 per cent also decided to defect, thus minimizing their losses. In the second condition they were told that their counterparts had decided to cooperate; in this condition 84 per cent decided to defect, thus maximizing their payoffs. In the third condition nothing was said about their counterparts' intended actions. However, since defection is the dominating action, i.e. the rational choice for both possible decisions by their counterpart, at least 84 per cent should have decided to defect. Instead, only 37 per cent made that decision, suggesting that well over half of respondents must have failed to take the extra step to think strategically about the impact of their counterpart's decision, focusing instead on the desirability of the cooperate-cooperate cell. In this case, cognitive myopia contributed to more cooperative behavior, resulting in an individually good and collectively excellent outcome.

Obstacles to predicting others' preferences

Even in situations where decision makers understand and appreciate that they are in a strategically interdependent situation, making strategic decisions is not as straightforward as the stylized framework of game theory would suggest. Few real-world decisions between cooperative vs. competitive action alternatives come with unambiguous payoff tables, and often not even with a well-defined action space. Instead, both parties need to generate their sets of possible actions and those of their counterparts, with the two not always being symmetric sets. They then need to construct their own utilities for finding themselves in each of the m-by-n cells, created by crossing their possible m actions with the n possible actions by their counterparts. And finally, and most difficult, they need to predict what their counterparts' utilities might be for ending up in each of the m-by-n cells.

Projection (egocentric biases) and stereotyping

How do people make such predictions about the preferences of others? Past behavior in the same or similar situations provides useful information. In the absence of such information, there are two general strategies, namely social projection or the use of stereotypes (Ames, Weber, and Zou 2012). Ames et al. show that participants in social dilemmas shift between social projection (using one's own preferences between courses of action to intuit a counterpart's preferences) and stereotyping (using general assumptions about a group to intuit a counterpart's preferences) as a function of the perceived similarity. Higher levels of perceived similarity between themselves and their counterparts are associated with increased projection and reduced stereotyping.

In addition to switching being projection and stereotyping, participants in strategic games can also be influenced in their assumptions of their counterparts' motives, and thus preferences, by manipulation of the reference class to which stereotypes are applied. Thus Libermann, Samuels, and Ross (2004) found that decisions in a Prisoner's Dilemma game could be influenced by the name assigned to that game. People who played 'The Community Game' cooperated approximately twice as frequently as participants who played an identical game entitled 'The Wall Street Game', presumably because they made different assumptions about their counterparts' motives, and thus their utilities, for different game cells.

Perceptual dilemmas

In international contexts, players in strategic games are typically antagonists, e.g. the USSR vs. the US during the Cold War. The Prisoner's Dilemma in Table 6.1 was designed to capture the assumed preferences of both sides regarding nuclear arming vs. disarming. There is, however, evidence to suggest that the arms race was more accurately modeled by a perceptual dilemma. In a perceptual dilemma, both sides prefer mutual arms reductions to all other outcomes; they want above all to avoid disarming while the other side arms, but they perceive the other side as preferring unilateral armament to all other outcomes. Plous (1993b) used surveys and interviews with US senators and European politicians with ties to Russian politicians during the time of the Cold War to show that the nuclear arms race should have been more appropriately modeled by a perceptual dilemma, a situation open to easier solutions than those required for a Prisoner's Dilemma. In this case, stereotyping of the other side and failure to see similarities between the two parties' situations led to potentially quite tragic misperceptions of the other side's motivations and preferences.

Greater use of some of the tools of the cooperation hexagon (Messner et al. in this volume) – in particular, communication – could, at least in principle, be used to avoid such errors. Communication, in combination with both initial trust and enforcement (when trust is violated), lies at the basis of creative paths to cooperation, even in Prisoner's Dilemma situations. Communication by action (rather than by 'cheap talk') is provided by the tit-for-tat strategy for repeated Prisoner's Dilemma interactions, which starts out with cooperation and then matches the other side's action on the previous trial, a simple and empirically winning strategy against a broad range of other strategies (Axelrod, 1984).

Failure to think forward and to backward induct

In what other strategic situations and tasks may cognitive limitations and resulting processing shortcuts have favorable consequences? The failure to think forward and to backward induct sufficiently in the context of some dynamic economic games provide other examples where cognitive myopia can lead to greater cooperation in some settings, even if it reduces the match between game theoretic predictions and observed behavior. Game theory has been a very powerful influence on understanding how forward thinking and backward induction ought to be used. However, descriptive *behavioral* game theory may prove to be more useful in understanding the presence or absence of cooperation in applied settings.

Evidence for a lack of forward thinking is perhaps most dramatically supplied by what is called the *Keynesian p-beauty contest*, a well-explored competitive game based on the ideas of John Maynard Keynes (1936: 156) when analyzing the dynamics of the stock market. The basic rules are that all members of a group need to guess a number between 0 and 100. The person whose number is closest to a proportion p of the mean of the guesses of all members will win a prize. The equilibrium solution to this game is provided by forward thinking, as follows: if everyone were to guess randomly a number between 0 and 100, then the mean would be 50. If p were 2/3, the winning number would be 33. But, of course, knowing that everyone would pick 33 would make the winning number 22, and so on. The eventual outcome of this iterative process, if forward thinking went to its logical conclusion, is that everyone would pick 0.

However, two things are true: (1) Data do not match this prediction. As shown by Nagel (1995) and by Ho, Camerer, and Weigelt (1998), choices are never, in initial rounds, 0. In fact they often reflect limited looking ahead, with peaks in responses reflecting the number of levels of forward thinking. For example, Level 1 (looking forward one level) at 33 in the game above, Level 2 at 22, Level 3 at 11, and so on. (2) Guessing the game theoretical equilibrium solution does not win the game. Instead, to guess the winning number one needs to think one level ahead of most people, but not further than that. To win in this game or to predict behavior, it is more important to understand the levels of rationality possessed by the other players than to follow the prescriptions of game theory.

Other evidence of myopia and limited future thinking is provided by studies that look at information searched for by competitors in economic games. Such work uses an analogue to eye movement recording to capture the attention and cognition of players. The basic payoff matrix is presented on a computer screen to participants, with the payoffs behind a label. When a cursor controlled by a mouse enters a cell, the payoff is revealed, and it is hidden again when the cursor exits. This technology has been extensively used to study individual choice, as well as more recently to study strategic choices (e.g. Costa-Gomes, Crawford, and Broseta 2001; Costa-Gomes and Crawford 2006; Johnson et al. 2002). Such methods can provide converging evidence about decision processes used in specific situations, including the use of backward induction, a basic tool for identifying equilibrium solutions in multi-stage games. The basic idea of backward induction is to focus first on the final round of the game and to then identify best responses to earlier stages from that perspective. One classic game to be solved in this fashion is the alternating offers or shrinking pie game (Rubenstein 1982), an analogy to management vs. labor union disputes, where the pie that needs to be distributed between two parties by alternating offers shrinks after each round, during which no agreement is reached. The game should be solved by backward induction. There are three rounds, and people should think first about what the payoffs are in the last round and work backwards from there to arrive at first and second round offers. However, significant amounts of data suggest that this is not an adequate descriptive model, since first-round offers are typically much higher than the game theoretical equilibrium. Johnson et al. (2002) hypothesized that this was due, in large part, to people failing to backward induct, suggesting that they instead only look one or occasionally two stages ahead, further evidence of cognitive myopia.

The advantage of using information acquisition data in this case is that such data provide direct evidence of the degree of consideration of future stages. Process data show that most players' information acquisition concentrated on the first round, with some not even looking at the payoff for the last round, and these looking patterns were closely related to the offers made. In addition, when players were explicitly instructed and trained to use backward induction, their offers were much closer to the equilibrium, and they spent much more of their time considering the final round payoff.

The limited nature of forward thinking in the beauty contest game and the failure of people to use backward induction to reason from end states in the shrinking pie game together suggest that cognitive myopia plays a key role in strategic contexts. Both of these examples also show that following the prescriptions of rational choice theory (in this case, game theory) would not necessarily or even typically improve the accuracy of predictions or the degree of cooperation – for example, backward induction in management: labor disputes would polarize the opening offers made by either side, probably making it less likely that a cooperative solution (i.e. an agreement rather than a strike) would be found. In this sense, cognitive myopia can again be seen as contributing to more cooperation in at least some settings.

Conclusions and takeaway

It is time to return to the title question of this chapter: can we think of the future? The evidence presented in this chapter paints both a 'glass-half-full' and a 'glass-half-empty' picture. The evidence tips more in the 'glass-half-empty' direction for decisions under risk, uncertainty, and time delay. A variety of interventions have evolved to help *homo sapiens* overcome existing barriers to future-oriented thought and decisions that do not exist for *homo economicus*. Historically, such interventions have involved paternalistic delegation of long-term planning decisions to experts (e.g. financial planners) and/or institutions (e.g. mandatory retirement savings plans).

More recently libertarian paternalism has been in greater favor, replacing compulsory mandates with choice architecture interventions, in settings from health care to retirement savings choices (e.g. Johnson et al. 2013), that gently assist and guide individual longer-term-planning decisions past the siren calls of immediate gratification and present bias (Elster 1979).

The fact that preferences are constructed can be a liability (making preferences context specific and leading to potential choice inconsistencies), but, as we showed earlier, they can also be an asset that provides tools to choice architects to help individuals achieve long(er)-term goals.

Evolution may have equipped us well to respond to risks and challenges in earlier and simpler choice environments (Weber 2006), with prepotent responses that favor immediate needs and result in present bias. Decisions that override the draw or 'temptation' exerted by such choice options require self-control, a resource that is in short supply (Figner et al. 2010). At the same time it has become very evident that the ability to override more impulsive, prepotent responses – i.e. choice of the immediate marshmallow in Mischel, Shoda, and Rodriguez's (1989) iconic developmental study with Stanford preschoolers – is correlated with a broad range of important life outcomes many years later, including educational attainment, salary, and marital satisfaction (Casey et al. 2011). Myopic choices do not always serve us well in the long run and are often regretted after the fact. While intertemporal tradeoffs and preferences are highly subjective, and one needs to be careful before calling any single decision incorrect or problematic, in many situations shortsighted individual decisions are resulting in social problems, from the obesity epidemic in many developed countries, to insufficient pension savings, to environmental crises that include resource and species depletion and climate change (Weber 2013).

Fortunately, different ways of presenting decision makers with choice options allow them to override temptation with more or less effort and thus more or less successfully. Interventions that focus attention first on choice options that are not automatically attended have been shown to increase consideration of arguments for larger later returns and to mediate greater patience (Weber et al. 2007; Zaval, Markowitz, and Weber 2015). Making forward-looking, future-oriented response options the choice default is an intervention that has been shown to be effective in a broad range of contexts, from organ donation (Johnson and Goldstein 2003) to retirement savings (Benartzi and Thaler 2004).

Cultural context also matters by influencing the chronic activation of different goals, and thus different attentional foci (Weber and Morris 2010). Hershfield, Bang, and Weber (2014) show that older countries (i.e. nation states that have been in existence longer) are more environmentally aware and have better environmental records. They explain this result by assuming that a longer past suggests a longer future, and that a longer perceived future motivates more forward-looking, future-oriented planning and action. In support of this country-level conjecture, the authors primed American respondents to perceive the US as either an old or a new country by showing them a time line that places the 237 years of US existence either as the major part of a time line, starting with Christopher Columbus's arrival in America, or at the very end of a time line, starting with the Roman empire. Respondents primed to perceive the US as an older country donated more of their experimental earnings to an environmental NGO.

The effects of cognitive myopia were not as uniformly negative in our review of strategic decision making. Here the general conclusion was that, at least at times, a myopic focus on one's own interests and actions and a failure to consider the interdependence of actions of two or more players may lead to more cooperation than predicted by classic game theory.

When decision makers do have the skill and expend the energy to think strategically, cooperation in social dilemma situations can be increased in other ways. Accurate assumptions about the utilities of different action cells in the game theoretic matrix are important to making sure that participants know what game needs to be solved. Perceptual dilemmas (Plous 1993b) may be relatively common. Misprediction of the other side's utilities can be the result of stereotyping, or at least stereotyping of an incorrect reference class. Global cooperation in a game theoretic sense may require an 'us' frame that may be politically infeasible, especially in contexts (e.g. climate change action) that lack a visible and imminent common enemy who can motivate a common front, and thus cooperation. Nevertheless, interventions that provide labels for such strategic interactions that prime cooperation, that suggest similarities, and that promote communication between the different parties can all help in smaller ways.

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