

# Psychology of Consciousness: Theory, Research, and Practice

## Consciousness of the Future as a Matrix of Maybe: Pragmatic Propection and the Simulation of Alternative Possibilities

Roy F. Baumeister, Heather M. Maranges, and Hallgeir Sjøstad

Online First Publication, May 17, 2018. <http://dx.doi.org/10.1037/cns0000154>

### CITATION

Baumeister, R. F., Maranges, H. M., & Sjøstad, H. (2018, May 17). Consciousness of the Future as a Matrix of Maybe: Pragmatic Propection and the Simulation of Alternative Possibilities. *Psychology of Consciousness: Theory, Research, and Practice*. Advance online publication. <http://dx.doi.org/10.1037/cns0000154>

# Consciousness of the Future as a Matrix of Maybe: Pragmatic Prospecction and the Simulation of Alternative Possibilities

Roy F. Baumeister

University of Queensland and Florida State  
University

Heather M. Maranges

Florida State University

Hallgeir Sjøstad

Norwegian School of Economics

Thinking about the future highlights the constructive nature of consciousness, as opposed to merely representing what is there—because the future is not yet available to be seen. We elaborate this point to emphasize how consciousness deals in alternative possibilities, and indeed preconscious interpretation confers meaning by recognizing these alternatives. Crucially, the goal of prospecction is less to predict what is sure to happen than to prepare for action in situations defined by sets of incompatible alternative options, each of which might or might not come true. We review multiple lines of evidence indicating that people conceptualize the future as just such a matrix of maybe. Thus, people think of the future as highly changeable. Most prospective thinking involves planning, which is designed to bring about one outcome rather than alternatives. Optimism may often reflect an initial, automatic response that is soon followed by conscious appreciation of obstacles and other factors that can produce less desired, alternative outcomes. People moralize the future more than the past, presumably to promote the more desirable outcomes. Anticipated emotion helps people evaluate future possible outcomes. People specifically anticipate the matrix of maybe and sometimes seek to preserve multiplicity of options. We integrate these patterns of findings with a pragmatic theory of prospecction: Thinking of the future as a multimaybe matrix is useful for guiding action.

*Keywords:* consciousness, future, possibility, prospecction, pragmatic

Consciousness presumably originated when simple brains began combining information from their sense organs to construct a subjective experience of the environment. In this article, we develop theory and present evidence fitting a view that human consciousness fundamentally involves much more than seeing what is there.

Its awareness of what is there is at best placed in the context of alternative possibilities. Often consciousness is used to simulate what is not there and what may never be there.

The vehicle for this is thinking about the future (prospecction; see Gilbert & Wilson, 2007). The study of how people think about the future is especially valuable for advancing theory of consciousness. Among other advantages, prospective thinking makes it obvious that the contents of consciousness are a simulation, that is, an experience constructed by mental processes and not a direct copy of the external world—because the future is not yet there to see.

The power of conscious thought to simulate counterfactual and nonfactual realities presumably evolved later than the simple construction of a mental model of the immediate environment. Humans may be quite unusual, even unique, in their extensive capacity to engage in

---

Roy F. Baumeister, School of Psychology, University of Queensland, and Department of Psychology, Florida State University; Heather M. Maranges, Department of Psychology, Florida State University; Hallgeir Sjøstad, Department of Economics, Norwegian School of Economics.

We gratefully acknowledge financial support from the John Templeton Foundation and intellectual inspiration by Martin Seligman.

Correspondence concerning this article should be addressed to Roy F. Baumeister, School of Psychology, University of Queensland, Brisbane, QLD, 4072, Australia. E-mail: [royfbaumeister@gmail.com](mailto:royfbaumeister@gmail.com)

such simulation. As one sign, ad hoc prospective thinking appears to be almost entirely unique to humans. Evidence for it among other primates is quite rare (see Roberts, 2002, for review)—so rare, in fact, that a case study of a single chimpanzee storing up rocks to throw at zoo visitors warranted a recent publication in a major biology journal (Osvath, 2009).

We propose that prospection is fundamentally about acknowledging that, viewed from the present, the future consists of sets of multiple alternative possibilities, some of which are incompatible with each other, so that some will come true and others will not. Indeed, the very fact of some particular possibilities coming true will prevent others from coming true. We shall argue that for pragmatic reasons, among others, the future is experienced as a matrix of alternative possibilities. Hence this prospective conceptualization of multiple alternatives is closely linked to agency, that is, the control of action based on seeking to realize some of them rather than others.

The alternative view is that there is only one predetermined or fated future, which perhaps a wise and well-informed person could effectively predict. The future does not really consist of assorted maybes, in this view—rather it is a lockstep journey, and so in principle it could be predicted from the present with precise accuracy. The perennial popularity of this theory is evident in the long history of belief in fate, destiny, oracles, fortunetelling, and the like. The theory proposed in this article fundamentally opposes that view and suggests that the role and function of conscious thought rest on the future as containing multiple incompatible alternative possibilities: the matrix of maybe.

A review by Evans (2008) identified awareness and volition as the two major themes in theories of consciousness. Awareness may have evolved initially as a product of mentally integrating immediate sensory input, but human conscious thought can roam among past, present, and future, so it is not tied to current input. Volition is relatively useless for the past but vital for present and future. We shall suggest that conscious thinking about the future activates agency and volition.

We assume that conscious experience is the product of unconscious processes, though it may enable kinds of thinking and feeling that go beyond what the unconscious can do alone. A

theme of this article is that the unconscious processes use meaning to construct alternative possibilities, which are endemic to conscious experience. The future in particular is constructed not as predicting what will inevitably or deterministically unfold but rather as a matrix of contingencies, that is, a set of alternative possibilities for events, outcomes, and actions. We call this the *matrix of maybe*.

Our analysis is thus an extension of pragmatic prospection theory (Baumeister, Vohs, & Oettingen, 2016; Seligman, Railton, Baumeister, & Sripada, 2016), which holds that the main reason for thinking about the future is to prepare for how to act in possible situations to steer events toward desired outcomes and away from aversive ones. To do that effectively, conscious thought represents the future as a set of possibilities and contingencies. Thus, the ability of consciousness to see beyond what is there is a central part of prospection. Moreover, the particular power of conscious thought emphasizes this multiplicity of possibilities.

Psychology has emphasized studying the past, and when it studies the future, it tends to emphasize prediction (see Baumeister et al., 2016). But why do people think about the future? One obvious answer is that they are trying to predict what will happen (hence the research emphasis on prediction). In contrast, pragmatic prospection theory says the main thrust in thinking about the future is less to predict what will happen than to predict points at which multiple different outcomes are possible and incompatible (so some will come true while others will not)—and, crucially, that oneself can exert some control over which ones come true. The important thing is predicting the choice points, not the eventual outcomes. Put another way, the purpose of prospection is not so much to predict future reality as to predict future possibilities—especially situations based on offering competing, incompatible ones. Those choice points and performance demands are the *raison d'être* of agency.

Indeed, although it is beyond the scope of this article, we seriously entertain the notion that consciousness creates alternative possibilities (in the sense that it makes it possible for them to become reality). It is precisely because people can imagine alternatives to the present that they can implement them, sometimes by creating a future situation that is importantly different

from the present one. As prominent examples at the collective level, people have been able to imagine societies very different from those that existed anywhere in the past, including many innovations that the rest of nature has not tried: democracy, the welfare state, government deficit spending as economic stimulus strategy, transformation of female roles, war-ending treaties, corporate law (even the very idea of a corporation as something separate from the people who work for it), sea and even air travel, and long-distance communication. By way of comparison, wolves, rats, and monkeys are highly social animals—but these have shown no signs of such transformations in social structure. They are apparently unable to implement these alternative versions of society, and we strongly suspect they are incapable of imagining them. Even among humankind, full-throttle imagining of alternative social structures, along with trying to implement them, is not much evident until the last few centuries (e.g., Baumeister, 1986, 1987). Humankind alone seems able to envision alternative possibilities and, on that basis, intentionally achieve collective change.

Recent laboratory work provides further evidence that it takes the power of conscious human thought to project the future as a matrix of maybe. Redshaw and Suddendorf (2016) provided dramatic evidence that human children far surpass adult nonhuman apes on this. Their apparatus was a tube shaped like an inverted Y. Thus, a ball or grape was dropped into the top and could come out either opening at the bottom. Either the participant caught it or it was gone. One could guess by holding one's hand under either of the openings, thereby succeeding about half the time—or one could use both hands to cover both openings, thereby succeeding 100% of the time. Two-year-old human children failed to solve this, but 3-year-olds and older children all soon achieved the perfect solution and caught the ball on every subsequent trial. In contrast, chimpanzees and orangutans never solved it. In fact, a couple of them stumbled by accident on the correct solution, happening to use both hands and catching the treat—but they failed to learn even from this success and on the next trial went back to one-hand guessing. Thus, success at this task required adjusting one's behavior to the fact that two different outcomes are possible, and this was apparently beyond the mental powers of the

smartest nonhuman primates, whereas human children could all figure it out. Human children could understand the future as multiple different maybes, but grownup apes apparently cannot think that way.

### Future as Matrix of Maybe

A distinctive aspect of the future is that it exists purely as a set of possibilities, unlike the present or past. Present and past events have a definite objective reality, and so alternative possibilities are counterfactual. In contrast, for the future there is no definite reality, and so possibilities are all that exist. In a sense, all prospecting is counterfactual—or, more precisely, nonfactual.

Perhaps this is why humans are much better able to engage in prospective thinking than other animals: Human consciousness uses meaning to invoke multiple alternatives, which are essential to thinking about the future—especially when doing so involves anything beyond simple expectancies. A proper understanding of the future (i.e., beyond simple expectancies, such as that thunder follows lightning) requires recognizing that it exists as a set of alternative possibilities. For want of a better term, we call this the matrix of maybe.

Pragmatic prospecting theory is built on William James's (1890/1983; see also Fiske, 1993) influential assertion that thinking is for doing. On that basis, it assumes that the purpose of thinking about the future is to guide action (Baumeister et al., 2016). The emphasis is less on predicting what is bound to occur than preparing for future actions. The actions needing preparation are ones that occur in the context of a contingency matrix—such that one's actions can steer the course of events toward some possible outcomes and away from others.

The notion of future as a set of alternative possibilities has precedent. In phenomenological philosophy, the concept of the ontological horizon referred to the set of possibilities that can be seen as possible given one's present situation (Heidegger, 1927; May, Angel, & Ellenberger, 1958). Closer to home in social psychology, situation structure inherently represents multiple possibilities. Baumeister and Tice (1985) sought to construct a theory of situation structure from the independent variables in social psychology experiments in its

leading journal, the *Journal of Personality and Social Psychology*, on the assumption that social psychologists generally studied how situational factors cause behavior. (Almost all textbooks in social psychology assert this.) A great variety of experiments have incorporated multioutcome structures as key aspects of the situation. These include degrees of control, choice, and freedom; having a specific option, such as to escape, or to return to earlier status quo; incentives, contingencies, and competition; anticipated further interaction with the same people; degree of responsibility and other implications of current actions; and power relations. Thus, crucial aspects of the current situation (at least as studied by social psychologists) involve sets of different possible outcomes, often riding on what action the person performed. In other words, a situation is partly a matrix of various possible actions and contingent outcomes.

Conscious thought therefore simulates these alternative possibilities and contingencies. Imagining them evokes emotions, which are useful to evaluate and compare them, so that the person knows which ones to pursue and which to avoid. Recognizing the divergence of outcomes enables the person to prepare for action at those choice points. More broadly, people can use conscious thought to make plans, which are scripts for how to act on particular future occasions so as to reach goals.

Nonetheless, the essential point is that thinking about the future is less oriented toward predicting what will happen than toward predicting points at which multiple outcomes are possible. Agentic action benefits from preparation. For this, the focus is not on what is bound to happen but on the matrix of maybe: Conscious prospection functions to ascertain what the alternative possible outcomes are, what is at stake, and what one can do about it.

### Applications and Evidence

This section will review several diverse lines of research relevant to the idea that conscious prospection invokes a matrix of maybe. That is, the functional task of conscious thought is often to simulate several different options and to prepare to steer events (by actions that include performance and decision) toward the desired outcomes.

### Future as Changeable

A classic study by Rothbart and Snyder (1970) illustrated the link between timing and perceived control. Participants bet on the outcome of a throw of dice. Everything was the same, including the odds and the absence of knowledge of the outcome, except that either the dice had not yet been rolled or had already been rolled. Yet participants bet more if the roll had not yet occurred rather than having already taken place. The implication was that people felt more able to control future than past events, even though the outcome was by chance and people had no actual power to control the outcome. In that study, they did roll the dice themselves. Brun and Teigen (1990) showed, however, that the greater willingness to bet on future than past outcomes extended to things completely and obviously beyond the individual's control, such as the gender of someone else's baby, or dice thrown by someone else, or the outcome of a distant soccer game. Perhaps ironically, participants preferred bets in the nearer rather than the more remote future, even by a couple of hours. But they preferred to bet when the outcome still lay in the future than in the past.

Indeed, people think their own powers of will can influence future but not past events, and this gives them more confidence about the future (Helzer & Gilovich, 2012). People seemed unable to fully appreciate the role their own willful action had in producing their past outcomes, whereas they overestimated the power of willful action for guiding future ones. Although this pattern is an irrational distortion of the facts, it may reflect an approach that is generally adaptive: People think of the future as undecided and thinking about the future activates their own sense of agency as something they will use to guide the future. This approach may explain Brun and Teigen's (1990) finding that people preferred to bet on the near rather than the distant future, because agency has to focus on what it will need to do sooner more than later. One has to know how to act tomorrow, whereas how to act next year can be decided at a later date. Pragmatic prospection generally has to be more concerned with the near than the distant future. These findings also suggest that the future (and especially the imminent future) activates impulses to exert control and volition.

Research on hypothetical thinking provides converging evidence. Ferrante, Giroto, Stragà, and Walsh (2013) gave participants a first task and instructed them to think either about how the past outcome could have been improved or about how future performances on the same kind of task could be improved. When discussing the past outcome, participants focused on uncontrollable aspects (e.g., external time constraints and innate abilities), whereas when thinking about the future they focused on aspects under their control (e.g., better strategies or better concentration). This fits the pragmatic view that thinking about the future activates agentic concerns about what they can do differently, whereas one's own agentic role is less relevant when analyzing past events.

## Planning

Planning is the sine qua non of pragmatic prospection (Baumeister et al., 2016). That is because the essential purpose of planning is to prepare for future action and thereby to guide events toward a desired outcome instead of the alternatives. There is no need to plan, and no point, if everything is inevitable.<sup>1</sup> Planning also essentially and fundamentally invokes the future as a multimaybe matrix: There is no need to make plans regarding events that are inevitable and about which nothing can be done. On the contrary, plans are explicitly designed to bring about desired outcomes rather than the alternative possibilities. A battle plan is necessary precisely because winning is far from inevitable.

Planning is beneficial in several ways. One prominent way mentioned by Townsend and Liu (2012), based on work by Laibson (1997; Laibson et al., 1998), is that when making plans one is not subject to momentary emotions and temptations, so one can plan rationally what is best to do. Thus, the planner's attitudes toward the various options can be more rational and wiser than those of the person choosing among the options in the heat of the moment (see also Thaler & Shefrin, 1981). Improvement in wise rationality is also the logical rationale for pre-commitment devices, in which the person forecloses future choices so as to preclude yielding to future temptation (Bryan, Karlan, & Nelson, 2010; Elster, 2000). For example, one commits to sending a certain amount of one's pay to a particular savings account that prohibits early

withdrawals, or one selects one's lunch menu for the next month and makes sure to choose a healthy, nonfattening diet.

Sniehotta, Schwarzer, Scholz, and Schüz (2005) distinguished two different types of planning. Both involve conscious representation of the future as a matrix of maybe. The first is action planning, which involves selecting what action to perform in what situations or in response to what stimuli. The second is coping planning, which involves envisioning what can go wrong and preparing to deal with these problems and obstacles. In one of Sniehotta et al.'s studies, rehabilitation patients planned to engage in exercise programs. Action planning was most helpful for getting started, whereas coping planning predicted later success (i.e., maintaining the exercise program over a long time and after the treatment phase had ended).

In fact, the prevalence of planning in prospective thought is an important basis for the pragmatic prospection theory. An experience sampling study by Baumeister, Vohs, Hofmann, Summerville, and Reiss (2017) found that roughly 75% of thoughts about the future involved planning. Thus, when people think ahead, usually they are not just wondering what will happen or seeking to predict future events or worrying—instead, they are actively formulating guidelines for future actions, choices, and performances. That data set also confirmed the pattern of emphasizing the near future, which is the pragmatic sweet spot, the most important time frame to think about. Overall, most thoughts about the future were in the near term, though some very long-range future thoughts were entertained.

Planning typically requires consciousness. There is precious little evidence of unconscious planning, and indeed constructing conceptual sequences of future events, based on a flow of causality amid alternative possibilities, may be beyond the powers of the unconscious.

Even the simplest of plans seems to require conscious intervention. These plans take the form of "if/when X, do Y" and have been called implementation intentions by Gollwitzer (1999), who

<sup>1</sup> To be sure, there is utility in planning around inevitable events, when one's own responses and their consequences are still non-inevitable. For example, one cannot prevent the hurricane from striking one's home, but one can prepare the home to withstand it better.

explained them in terms of the conscious mind turning over control of behavior to externally cued unconscious processes. Masicampo and Baumeister (2011) concluded that the unconscious mainly needs the conscious mind to formulate such plans, after which the unconscious can remain alert for a particular cue or circumstance and then initiate the preplanned action. They showed that this explains the Zeigarnik (1938) effect, which is that unfinished tasks evoke nagging reminders popping into the conscious mind.

Traditional theories about the Zeigarnik effect have fallen into two camps, which invoke different views of how the conscious and unconscious mental processes relate to each other (and to behavior). The first camp assumes that consciousness has little or no causal power, so that the unconscious is making sure to finish the task. The Zeigarnik effect occurs in this view because the unconscious informs the conscious mind of progress toward goals, and so it periodically lets the conscious mind know it is continuing to work toward the unrealized goal. The other camp holds that the unconscious is disturbed by the unfinished task and therefore reminds and pressures the conscious mind to resume and finish the job. Masicampo and Baumeister (2011) rejected both of those theories by showing that the intrusive thoughts stopped as soon as the person made a specific plan (implementation intention) to finish the job on some particular occasion. No objective progress had been made toward the goals, but the unconscious is apparently content to watch for the trigger circumstance X in order to resume the goal pursuit.

Thus, the unconscious seems to need the greater capacity of conscious thought in order to make plans. The unconscious can then automatically execute the plans as specified by conscious thought.

We noted that narrative stories require consciousness (Baumeister & Masicampo, 2010). Plans have narrative structure and have even been characterized as “stories about the future” (Oettingen, 2014). A further important point is that planning requires effortful conscious thought. Preliminary evidence for this was furnished in the experience sampling data by Baumeister et al. (2017), who found that people rated their thoughts as involving conscious control much more when planning than when en-

gaged in other thoughts about the future. Sjøstad and Baumeister (2018) provided more systematic evidence. They used various manipulations of ego depletion and mental fatigue, during which people lack energy for challenging tasks and therefore seek to avoid expending more energy (e.g., Baumeister & Vohs, 2016). In such states, people exhibit a pronounced disinclination to plan.

Much conscious thought is independent of immediate stimuli, most notably in the form of mind-wandering. Baird, Smallwood, and Schooler (2011) observed that mind wandering is generally regarded as a kind of cognitive failure, as it indicates the cognition is off-task and therefore presumably unhelpful. Against that characterization, they showed that mind-wandering often involves spontaneous planning for future events in one’s life. This could be highly adaptive: When current activities do not demand full conscious attention, the mind naturally wanders toward future situations that will require choice or effective performance. During down time, the unconscious mind automatically prompts the conscious mind to prepare for future contingency matrices.

In sum, planning is a form of prospection that rests on conscious thinking and simulation of multiple future outcomes, as well as prescribing particular responses to the choice points and tests that are likely to present themselves. Planning is pragmatic preparation for future action, including both performance demands and choice points. Thus, planning uses conscious thinking to address upcoming situations involving a matrix of maybe.

### **Probability, Prediction, and Optimism**

Much research on prospection has emphasized predicting what is likely to happen (e.g., Gilbert & Wilson, 2007; Tetlock & Gardner, 2016; Tetlock, Mellers, Rohrbaugh, & Chen, 2014). Such work already assumes the multi-maybe matrix to some degree. Predicting the inevitable is pointless, even if the event is important. It is, for example, highly desirable that the sun will rise tomorrow, but no money is to be made nor credit to be gained by predicting it today. In contrast, predicting outcomes in highly uncertain cases with multiple possibilities is something that can bring both money and prestige, as in the laborious and expensive poll-

ing to predict outcomes of political elections, the widespread efforts to predict tomorrow's weather or next month's stock exchange trends, and the contentious efforts to predict the outcome of heavily wagered sports events.

Optimism is subjective confidence that the more desirable outcomes are more likely than the bad ones to come true. Optimism thus assumes a context in which different outcomes are possible. In that sense, optimism exists only in the context of a matrix of maybe.

Unrealistic optimism has long been characterized as a fundamental characteristic of thinking among mentally healthy, well-adjusted people (Taylor & Brown, 1988; Weinstein, 1980). Unrealistic optimism presumably rests on a variety of unconscious biases, so that what occurs in consciousness is a view of the future that is pleasingly populated with the expectation of many good things. Recent work has extended optimism into specifically believing that other people will change their beliefs, opinions, and preferences to agree with one's own (Rogers, Moore, & Norton, 2017).

When people contemplate the future consciously for a while, however, some of that optimism appears to evaporate. Monroe, Ainsworth, Baumeister, and Vohs (2017) noted that it is easy and cost-free to forecast a bright future in response to survey questions, as much research has found (e.g., Shepperd, Klein, Waters, & Weinstein, 2013; Weinstein, 1980). There may even be norms that encourage people to express upbeat, confident forecasts for the future. Among other social benefits, people prefer to follow (and elect) leaders who exude optimism (Zullow, Oettingen, Peterson, & Seligman, 1988). Tenney, Logg, and Moore (2015) noted that it is even fundamentally rational to affiliate with optimistic people. If all forecasts were literally and precisely accurate, then those who forecast positive views are headed for positive futures, whereas people who make negative forecasts are headed for trouble—so it is much better to cast one's lot with the former. Unfortunately, this basic appeal of optimism, and its tendency to be reinforced with social support and acceptance, seems likely to encourage people to express optimistic confidence even when that is less than fully justified. To be sure, hearers wishing to cast their lot with future winners may become skeptical of people who simply claim that their future is bright. von

Hippel and Trivers (2011) proposed that self-deception is often adaptive in service of other-deception: Whereas hearers may learn to discriminate who is lying, they are less effective at spotting those who earnestly believe the falsehoods they assert. Therefore becoming subjectively convinced of one's optimism would increase one's social appeal by making detection of falsehood more difficult.

Still, the prevalence of optimism suggests that the widely replicated patterns of optimistic forecasts are the result of shallow processing and automatic responses, guided by a default norm of being positive and optimistic. Greater engagement of conscious thought might yield a different pattern. To test this, Monroe et al. (2017) moved beyond simply asking participants to make idle predictions about possible future events and had them engage in conscious contemplation of the future for several minutes. After this, they were asked to make behavioral decisions with varying degrees of financial risk. If contemplating the future simply promotes optimism, then people should be willing to tolerate more risk to pursue greater rewards. But the opposite result obtained. After contemplating the future, people became risk-averse, playing it safe with low-reward, low-risk decisions. This was found first with a hypothetical investment paradigm and second with the trust game from behavioral economics. In the trust game, people are given a monetary stake and told that any portion that they consented to send to a partner (a stranger) would be quadrupled in value, whereupon the stranger could decide how much, if any, to return to the participant. An optimistic person would assume the other person would share the proceeds and so they would choose to quadruple all the money, thereby leaving plenty for both self and partner—but people who had recently contemplated the future made the opposite, pessimistic choice.

The Monroe findings do not invalidate the abundant evidence of optimistic forecasts. They do however indicate the need for a more complex and nuanced theory about prospective thinking. Baumeister et al. (2016) proposed that there are at least two stages in thinking about the future. Building on the work by Oettingen (e.g., 2014) as well as the Monroe et al. (2017) findings, they proposed the following. The purpose of thinking of the future is to guide one's behavior so as to

produce positive outcomes from among the matrix of possibilities. When people first think about the future, they imagine what they want to happen (i.e., the positive outcomes). This pattern constitutes the optimistic side of prospection. It is based on rapid, automatic processes. The second stage, however, is the pragmatic elaboration of how to get to the positive outcome. It necessarily focuses on obstacles, pitfalls, problems, and the like, and so may engender pessimism. An effective plan will take note of actual contingencies and anticipate all that could go wrong. Both steps invoke multiple possibilities, but the first focuses on the best obtainable outcome, and the second focuses on the undesired alternatives.

Recent evidence has supported the two-stage model. Sjøstad and Baumeister (2017a) asked participants to make personally relevant predictions, by random assignment either very rapidly or only after a pause. The rapid predictions were significantly more optimistic than the delayed ones. This fits the pattern of automatic optimism followed by cautious reflection on what can go wrong.

The difference between action and coping planning may be relevant. As described above, Sniehotta et al. (2005) found that action planning was more helpful for getting started, whereas coping planning was more effective for maintaining success over a longer time frame. Again, the optimistic focus on the benefits may be helpful for motivating the start, but sustaining over the long run will require dealing with obstacles.

Thus, optimism involves forecasting a positive, desired future, and that may be an important and adaptive first step in deciding how to act. But after envisioning what one would like to happen, one has to contemplate problems and obstacles in order to prepare to deal with them. The goal of thinking about the future is to prepare oneself for actions and choices that will bring about desired outcomes. This requires a balance between knowing what one wants and knowing what might prevent that from happening.

### **Morality**

Morality is an important category of human social cognition. For present purposes, the key

point is that moral judgments often involve conscious thinking about a multimaybe matrix. Moral judgments are basically about whether one should act differently in that situation. The judgment that the person should have acted differently presupposes that the person could have acted differently. Moral principles are not generally applied to events or circumstances for which there are no alternative possibilities. When acting differently is regarded as impossible, moral condemnation is muted (e.g., Shariff et al., 2014).

Thus, morality projects the future as a contingency matrix, and it identifies several dimensions of evaluation of the options and then furnishes the judgments and reasons for preferring particular options. These are often not the ones that other deeply rooted impulses would dictate. The power of morality for dealing with the matrix of maybe is evident in some provocative findings by Phillips and Cushman (2017). They showed that people tended to regard immoral events as impossible when contemplating them—though this was largely an automatic reaction, and when responding in a slower, more deliberative manner, the impossibility subsided. The implication is however that people use moral judgments to shut certain options out from consideration. As further evidence, Cooney, Gilbert, and Wilson (2016) showed that people express stronger concerns about fairness before rather than after resources are distributed. Beforehand, the procedure for distributing is still changeable, and so morality can be used to alter the upcoming outcome.

Recent theorizing about morality has increasingly emphasized the future. We assume that morality is basically pragmatic and functional: Societies adopt moral rules because these improve group functioning and survival. The content of moral rules derives from principles of system effectiveness and efficiency, which is why many moral rules are similar all over the world, in all cultures. Prohibitions against murder and theft, exhortations to take turns and tell the truth, support for helping and cooperation, obligation to reciprocate favors, and other widespread values reflect what is probably necessary for a human society to survive and thrive. Hence efforts to promote morality are tied to the desire for a harmonious future.

A first issue regarding morality concerns whom to trust. Whereas most research on moral judg-

ment has focused on judging specific and often past actions, Uhlmann, Pizarro, and Diermeier (2015) proposed that the core purpose of moral judgment is to assess people so as to predict their future actions. Their argument fits well with the evolutionary analysis assuming that the human social mind evolved particularly to master cooperation with nonkin, something few other mammal species have achieved as a general way of life.

Future cooperation is a key driver of moral evolution (Tomasello, 2016; Tomasello et al., 2012). Humans evolved to cooperate, and obtaining food by either hunting or foraging soon required trusting and working with others. To survive, people had to ensure that others would cooperate with them, so they had to develop concern to maintain a morally good reputation. Moreover, it behooved human groups to ensure that particular individuals did not endlessly take benefits without contributing. On any particular occasion, individual free riders may partake of the spoils of others' work without damaging the group (as is seen in many primate groups), but an ability to project into the future would recognize that continuing in that pattern would undermine the group's productive functioning. Hence prospection facilitated the evolution of moral sentiments to punish individuals who shared in group benefits without contributing (Price, Cosmides, & Tooby, 2002).

More broadly, if you want your society to thrive in the future, then you want it to be highly moral, so that people can be trusted to be honest and fair and responsible, and to do their jobs ethically and conscientiously. Promoting morality in your social group will build a better society and hence better life for you and your progeny. Based on this line of reasoning, one could predict selective moralization of the future: People should be extra vigilant about the moral quality of future possible actions.

People do moralize the future. Caruso (2010) noted that the moral wrongness of a misdeed should in principle be the same regardless of whether the misdeed occurs yesterday, today, or tomorrow. Yet participants in his studies repeatedly made stronger moral judgments about identical actions situated in the future than the past. Sjästad and Baumeister (2017b) noted that it might simply be selfish to insist that other people behave morally in the future, but such concerns would dictate that one's own actions should be treated more leniently in the future

than the past, because one wishes to escape punishment. Yet research participants called for stronger punishments (and rewards) for their own future moral actions than past ones.

Thus, we have a sweeping pattern of moralizing the future. Future actions are seen in the context of alternative possibilities and contingencies, much more than past actions. People hold higher moral standards for future than past actions—including their own.

Monroe et al. (2017) provided additional evidence of the moralization of the future. Participants all judged hypothetical actions, presented as if they had occurred but not importantly situated in time. The independent variable was whether people had been primed to think about the future or the present, by having them rewrite sentences referring either to the future or the present. When they were in a future mindset, they judged hypothetical misdeeds more harshly than when they were in a present-focused mindset.

Some evidence even indicates that thinking about the future increases the moral quality of actions. Sjästad (2017) found that participants who adopted a future-oriented mindset shared more money with others in public choice scenarios, compared to participants in a control group who focused on the present. Thinking about the future did not increase purely altruistic cooperation in the form of anonymous generosity—rather, it mainly increased sharing that was linked to maintaining a good moral reputation. Thus, much in line with Tomasello's (2016) work, these findings suggest that the future-oriented aspect of morality is deeply rooted in pragmatic and strategic concerns.

In sum, morality essentially involves a context of multiple possible actions, and a key purpose of morality is to encourage performance of some actions rather than others. Although many moral reactions to specific actions are automatic, the full power of morality depends on conscious consideration of alternative possibilities—especially those lying in the future. Much moral thought is driven by preparing for future actions and trying to anticipate which other persons deserve future trust.

### Anticipated Emotions

Emotions are conscious states, and indeed the causal role of experimentally induced emotions is one important and potent rejoinder to theo-

rists who doubt that consciousness causes behavior (Baumeister, Masicampo, & Vohs, 2011). However, when emotions directly cause behavior, the results are often irrational and self-defeating—which severely complicates any theory that emotions evolved to drive behavior, because natural selection would select against anything that produced self-destructive outcomes. Baumeister, Vohs, DeWall, and Zhang (2007) concluded from a literature review that emotion operates as part of a feedback loop to guide behavior, rather than directly initiating action. As people learn what actions produce what emotional outcomes, they begin to guide behavior based on anticipated (as opposed to currently experienced) emotions.

Since Baumeister et al.'s (2007) article, evidence has continued to accumulate for the importance of anticipated emotions. A large meta-analysis by DeWall, Baumeister, Chester, and Bushman (2016) found that the vast majority of mediation analyses in social psychology have yielded nonsignificant results for currently felt emotion. In contrast, anticipated emotion was generally significant as a mediator when it was measured and tested, although such reports were infrequent. Their call for more study of anticipated emotions has begun to bring more such results. Baker, McNulty, and VanderDrift (2017) overturned decades of work based on relationship satisfaction and commitment by showing that anticipated future satisfaction affected commitment more than did current satisfaction—and even the familiar effects of current satisfaction were mediated by anticipated satisfaction. Thus, current feelings toward one's partner are mainly influential insofar as they serve to predict future satisfaction.

One large program of research on anticipated emotion has involved affective forecasting, that is, predicting one's future emotions (Gilbert & Wilson, 2007; Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). A broad theme has been that people predict correctly which emotions will ensue but overestimate their duration and intensity. As noted by Baumeister et al. (2007), this fits the view that anticipated emotions are useful for guiding behavior—presumably they can do this more effectively if their strength and duration are overestimated. After all, who would go out of their way to avoid a brief, minor twinge of bad feeling, especially as opposed to a long and nasty bout of dysphoria?

In contrast, most people would readily exert themselves to avoid prolonged future misery.

Anticipated emotions are useful for evaluating future possible courses of action—but the matrix of maybe is a crucial context for its usefulness. The purpose of thinking “If I do X, I will be happy, but if I do Y, I will regret it and feel guilty” is to encourage the agent to choose to do X instead of Y. One implication, however, is that anticipation of emotional outcomes may shift based on the agent's current states and capacities. Recent studies have provided some support for such changes in emotional anticipation. Ent and Baumeister (2016) found that the state of ego depletion reduced anticipated guilt. That is, participants had to articulate several personal goals and then were asked to predict how guilty they would feel if they were to fail to reach all of these goals. Participants in whom the experimental procedures had induced a state of reduced resources for agentic volition—for whom, therefore, reaching goals would seem extra difficult—downplayed how guilty they would feel over failure. This fits the view that anticipated guilt helps motivate people to exert effort to achieve their goals. As the goals start to seem unattainable, the utility of guilt dwindles, and so people cease to anticipate guilt.

Recent evidence confirms that people adjust their emotional expectations for motivational purposes. Sjøstad, Baumeister, and Ent (2017) asked participants to predict how happy they would be to achieve a perfect score on an upcoming 6-item test (which in some procedures carried a prize) after having gotten either 2 or 5 correct on an initial, warm-up test. Logically, improving from 2 to 6 should bring more delight than improving from 5 to 6, and that is what people predicted other people would feel. When predicting their own reactions, however, the initial score of 2 made the goal of 6 seem unattainable, and people disengaged—that is, they predicted relatively little happiness would ensue even if they were to achieve the perfect score. Actually, the predictions were wrong: When people took the second test and were informed they did achieve a perfect score, they were very and equally happy regardless of first-round score.

The role of conscious simulation in planning future actions involves anticipated emotion. Damasio (1994) studied people with brain injuries that stifled emotional responses. They were

quite able to project future possibilities, but they were unable to choose among them, even for something as minor as scheduling the next appointment. The implication is that the conscious mind envisions future possible courses of actions and outcomes and then also mentally simulates what emotions one will likely feel with each. This is a crucial basis for deciding. Hitting someone or drinking too much or sleeping with the wrong person may seem appealing in the short run, but if one can forecast the future in which these actions will lead to extended regret and other unhappy emotions, one can perhaps make a wiser choice.

A disturbing corollary is that some courses of action may bring positive emotion in the near future but unhappiness, even misery, in the long run—so people wishing to enjoy the imminent rewards may strategically stop thinking about the future. A classic study by Petry, Bickel, and Arnett (1998) assigned students and heroin addicts to complete a story in which a man woke up and began to think about the future. The students' stories typically extended about 5 years into the future, whereas the heroin addicts' stories extended less than two weeks. With addiction, of course, the positive emotions are near at hand whereas the (often considerable) costs lie farther in the future, and so curtailing prospection enables them to avoid anticipating the costs of their actions. Bickel, Odum, and Madden (1999) showed that cigarette smokers discounted the future in an economic delay-discounting paradigm. Crucially, however, ex-smokers valued the future as much as never-smokers. A possible implication is that the refusal to think far in the future is a cognitive defense employed by addicts that helps sustain their self-destructive behavior pattern.

Thus, people guide current behavior partly on the basis of anticipated future emotions, and to do so is largely adaptive. Some strategically manipulate or ignore their prospective emotions to protect themselves from feeling bad or to enable themselves to engage in pleasurable indulgences that carry long-term costs.

### **Anticipating Multiplicities of Possibilities**

Thus far we have emphasized projecting the multimaybe matrix as an aid to promote a particular future outcome over its alternatives. We round out our review by covering findings that

go beyond this to show other uses of the matrix of maybe.

Maintaining the multiplicity of options may itself be desirable. Reactance theory asserted that people desire to maintain multiple options, so when one option is removed people suddenly find it more attractive and like it better than they did beforehand (Brehm, 1966). That work was typically couched in an interpersonal context, such that another person threatened the participant's freedom, but even apart from specific interpersonal threats, people may seek to preserve a multiplicity of options.

It even appears that people have an irrational affection for uncertainty. Tormala, Jia, and Norton (2012) showed that people react more favorably to potential future achievement than identical but already existing achievement. For example, they prefer to hire someone recommended as potentially prize-winning than someone who has actually won the same prize.

A further application of conscious prospection to the multiplicity of futures is that people may adjust their present behaviors based on the matrix of maybe, not just to seek a particular future outcome over its alternatives, but even to maintain the availability of multiple options. Shin and Ariely (2004) showed that decision makers preferred to retain multiple options and were reluctant to lose any options—even when those options were of little interest or appeal. In these experiments, decision makers would sacrifice resources, including both effort and money, to “keep doors open,” that is, preserve the multiplicity of possible outcomes.

Unchosen options can reduce stress. Glass, Singer, and Friedman (1969) showed that exposure to unpredictable stress had substantial costs in terms of impaired concentration and increased errors on subsequent tasks. These effects were eliminated, however, among participants who had been told they had a “panic button” during the stress exposure. In that condition, the experimenter told participants that they could terminate the stressful noise by pressing a button on the desk if the noise became too aversive. The experimenter said pressing the button would ruin the data, and in fact no participant ever pressed it. (It would not have worked anyway.) Yet having it there reduced the harmful effects of the stressful noise. Thus, a false conscious belief in the availability of one future option, namely that one could escape

from stress should it become highly unpleasant, eliminated the negative aftereffects of the stress.

Several implications for the matrix of maybe follow from the panic button effect. First, it indicates that a substantial part of the negative aspect of stress is not the exposure to negative stimulation itself but rather the threatening possibility that it could continue and get worse, thereby exceeding the person's coping resources. Prospective threat alters current conscious processing and affective reactions. Thus, the effects of stress can have a prospective dimension.

Second, the multiplicity of options, as reflected in this case by having an option that one never exercises, can mitigate the negative impact of what does actually happen. Thus, psychological consequences ensue not just from what actually happens but also from the fact that something is (was) merely possible. The panic button removes from the matrix the threatening possibility that the current unpleasantness could become intolerable. (If it did, one could just press the button and end the unpleasantness.)

Other lines of work suggest that people adjust their current actions targeting not actual outcomes but sets of possibilities. Avoidance of temptation is one prominent example. (In this case, one helps one's cause not by preserving options but by foreclosing troublesome ones—as with precommitment.) Presumably by avoiding temptation, one can reduce the chances of succumbing to regrettable indulgence—even though technically one could always decline to exercise that option at a later point. The reformed alcoholic who enters a bar with friends and consumes only nonalcoholic beverages proves that the availability (possibility) of alcohol does not itself produce relapse, but people who strategically avoid even having the option, such as by never entering the bar, have a higher success rate at quitting addiction than those who count on their resolve and willpower to prevent lapse. Likewise, having sweets and chips in the cabinet does not doom a dieter to failure, but many dieters wisely prefer to eliminate temptation by removing all such foods from their kitchens.

The strategic avoidance of temptation has been shown in various studies. Hofmann, Baumeister, Förster, and Vohs (2012) were surprised to find that people scoring high in trait self-control resisted fewer desires than other

people. The common assumption that good self-control enables one to resist problematic desires had led to the opposite prediction. But apparently good self-control operates more by avoiding than by resisting temptation: People high in trait self-control reported fewer problematic desires, so there was less need to resist them. It is the people with low self-control who despite having resolved abstinence find themselves in the bar with friends, struggling to remember exactly why they should not even have one little beer, and so on.

Further work by Ent, Baumeister, and Tice (2015) provided explicit evidence that people with high trait self-control avoid temptation, thereby prospectively altering their matrix of possibilities. Participants high in trait self-control reported more proactive avoidance of temptation. These behaviors included not only avoiding situations containing immoral temptations but also choosing friends who facilitate approaching one's goals, making careful plans, and selecting places to work based on absence of potential distractions. In one experimental study, participants high in self-control were more likely than others to choose to wait for a quiet room to take a test, as opposed to taking a readily available but noisy room. Ent et al. also showed that high self-control predicted choosing a test format that minimized presentation of fascinating distractors.

These studies show that people value not just specific options but the very presence of multiple options. Having multiple options is valued despite the fact that not all of them can come true. They may contribute to coping planning: Should things go not quite as desired, one has additional options and can change course. This restores control to the (future) agent.

## Discussion and Conclusions

People think about the future, not primarily as an attempt to predict what is bound to happen, but as a series of points at which events can go in different directions. The future is less a matter of something to be known than something to be shaped and guided amid multiple alternative possibilities. The ancient and perennially appealing notions of fate, destiny, predestination, and determinism say that one particular future is already inevitable and could in principle be known from the present. But contrary to

them, we have presented evidence that people think of the future as a matrix of maybe, in which a great many things might happen but also might not happen. Such a view is precisely what would be most pragmatic for an agent whose choices and performances can steer events one way or another (thus obviously assuming that both ways are possible). One of the most important functions of human conscious thought is to simulate how one's various possible actions and choices will lead to different outcomes and to evaluate those, so as to know which ones to favor.

We cited Evans's (2008) view that theories of consciousness focus on awareness and volition. Simple animals are aware of what is immediately present and choose a response. Human awareness, involving conscious thought, does much more. It can project an array of possible future outcomes linked to various actions and external contingencies, and on that basis, it can initiate an action not merely as a response to an immediate stimulus but as a strategic and proactive way of steering events toward desired outcomes far beyond what is immediately discernible. Some human actions are explicitly aimed at outcomes in the distant future, even beyond the end of the actor's life.

We reviewed multiple lines of evidence indicating that people regard the future as a matrix of maybe, that is, a set of sometimes incompatible possibilities. People seek to preserve options. They adjust current behavior based on comparing the anticipated emotional outcomes from various lines of action. They think about the future more than the past in terms of multiple alternative possibilities and outcomes. The majority of prospective thinking has some element of planning, which is designed to produce particular outcomes rather than the alternatives. People first optimistically project desired outcomes and then pessimistically consider all that can go wrong. Articulating goals and desired outcomes is relatively easy, but making plans for how to realize them requires mental effort and self-control. People moralize the future more than the past, presumably in the hope of ensuring better actions by both self and others. Some avoid temptation so as to remove some tempting but disapproved options from the matrix of what will be possible. Above all, they recognize the future as changeable whereas the past is not.

Our review also indicated the importance of conscious thought for treating the future as a ma-

trix of maybe. Several lines of evidence suggested that the unconscious operates on the basis of a largely deterministic worldview. The unconscious can execute simple plans but appears to require conscious thought to create them (hence the Zeigarnik effect). Automatic, simple forecasts tend to be optimistic, whereas conscious thought is required for the more complex and nuanced processes of contemplating obstacles and planning. Automatic responses treat immoral actions as simply impossible, whereas conscious thought allows them as possible.

Meaning is central to the projection of the future as a matrix of maybe. Meaning inherently locates entities in context of alternative possibilities. Meaning as nonphysical connection is also vital for making conceptual links among the present and various possible future events. Further work may find that prospection helps with the grand question of how consciousness and language are interrelated.

The notion that the unconscious holds a deterministic worldview whereas the conscious mind embraces multiple possible outcomes is consistent with evidence about free will. Shepherd (2012) found that people associate free will with conscious choice, and indeed the notion of unconscious free will has hardly ever been taken seriously in the extensive, multidisciplinary literature about freedom of action. The link between free action and conscious thought may well reflect the specific power of conscious thought to conceptualize a multimaybe matrix and to guide action on that basis.

Thinking about the future seems linked to conscious agency, and indeed the near future is particularly potent in this regard. The emphasis on the near future is consistent with pragmatic prospection theory, because it is urgent to prepare for imminent actions and choices, whereas more distal ones can wait.

In general, then, people think about the future to prepare their actions and responses. Consciousness is a powerful mechanism for projecting multiple alternative possibilities, evaluating them with the help of anticipated emotional outcomes. The power of human consciousness resides only partly in representing and interpreting the world as it is. Alongside that, and perhaps far more important, consciousness can simulate what is not there, indeed what might but also might not happen. People who base their actions on such simulations of future pos-

sibilities, thereby capitalizing on this power of the human conscious mind, get through life much more successfully than those who do not.

## References

- Baird, B., Smallwood, J., & Schooler, J. W. (2011). Back to the future: Autobiographical planning and the functionality of mind-wandering. *Consciousness and Cognition: An International Journal*, *20*, 1604–1611. <http://dx.doi.org/10.1016/j.concog.2011.08.007>
- Baker, L. R., McNulty, J. K., & VanderDrift, L. E. (2017). Expectations for future relationship satisfaction: Unique sources and critical implications for commitment. *Journal of Experimental Psychology: General*, *146*, 700–721. <http://dx.doi.org/10.1037/xge0000299>
- Baumeister, R. F. (1986). *Identity: Cultural change and the struggle for self*. Oxford, UK: Oxford University Press.
- Baumeister, R. F. (1987). How the self became a problem: A psychological review of historical research. *Journal of Personality and Social Psychology*, *52*, 163–176. <http://dx.doi.org/10.1037/0022-3514.52.1.163>
- Baumeister, R. F., & Masicampo, E. J. (2010). Conscious thought is for facilitating social and cultural interactions: How mental simulations serve the animal-culture interface. *Psychological Review*, *117*, 945–971. <http://dx.doi.org/10.1037/a0019393>
- Baumeister, R. F., Masicampo, E. J., & Vohs, K. D. (2011). Do conscious thoughts cause behavior? *Annual Review of Psychology*, *62*, 331–361. <http://dx.doi.org/10.1146/annurev.psych.093008.131126>
- Baumeister, R. F., & Tice, D. M. (1985). Toward a theory of situational structure. *Environment and Behavior*, *17*, 147–192. <http://dx.doi.org/10.1177/0013916585172001>
- Baumeister, R. F., & Vohs, K. D. (2016). Strength model of self-regulation as limited resource: Assessment, controversies, update. *Advances in Experimental Social Psychology*, *54*, 67–127. <http://dx.doi.org/10.1016/bs.aesp.2016.04.001>
- Baumeister, R. F., Vohs, K. D., DeWall, C. N., & Zhang, L. (2007). How emotion shapes behavior: Feedback, anticipation, and reflection, rather than direct causation. *Personality and Social Psychology Review*, *11*, 167–203. <http://dx.doi.org/10.1177/1088868307301033>
- Baumeister, R. F., Vohs, K. D., Hofmann, W., Summerville, A., & Reiss, P. (2017). *Everyday thoughts about past, present, and future: An experience sampling study of mental time travel*. Manuscript submitted for publication, University of Minnesota, Minneapolis, MN.
- Baumeister, R. F., Vohs, K. D., & Oettingen, G. (2016). Pragmatic prospection: How and why people think about the future. *Review of General Psychology*, *20*, 3–16. <http://dx.doi.org/10.1037/gpr0000060>
- Bickel, W. K., Odum, A. L., & Madden, G. J. (1999). Impulsivity and cigarette smoking: Delay discounting in current, never, and ex-smokers. *Psychopharmacology*, *146*, 447–454. <http://dx.doi.org/10.1007/PL00005490>
- Brehm, J. (1966). *A theory of psychological reactance*. New York, NY: Academic Press.
- Brun, W., & Teigen, K. H. (1990). Prediction and postdiction preferences in guessing. *Journal of Behavioral Decision Making*, *3*, 17–28. <http://dx.doi.org/10.1002/bdm.3960030103>
- Bryan, G., Karlan, D., & Nelson, S. (2010). Commitment devices. *Annual Review of Economics*, *2*, 671–698. <http://dx.doi.org/10.1146/annurev.economics.102308.124324>
- Caruso, E. M. (2010). When the future feels worse than the past: A temporal inconsistency in moral judgment. *Journal of Experimental Psychology: General*, *139*, 610–624. <http://dx.doi.org/10.1037/a0020757>
- Cooney, G., Gilbert, D. T., & Wilson, T. D. (2016). When fairness matters less than we expect. *Proceedings of the National Academy of Sciences of the United States of America*, *113*, 11168–11171. <http://dx.doi.org/10.1073/pnas.1606574113>
- Damasio, A. R. (1994). *Descartes' error: Emotion, reason, and the human brain*. New York, NY: Avon Books.
- DeWall, C. N., Baumeister, R. F., Chester, D. S., & Bushman, B. J. (2016). How often does currently felt emotion predict social behavior and judgment? A meta-analytic test of two theories. *Emotion Review*, *8*, 136–143. <http://dx.doi.org/10.1177/1754073915572690>
- Elster, J. (2000). *Ulysses unbound: Studies in rationality, precommitment, and constraints*. Cambridge, UK: Cambridge University press. <http://dx.doi.org/10.1017/CBO9780511625008>
- Ent, M. R., & Baumeister, R. F. (2016). *Ego depletion attenuates anticipated guilt*. Unpublished manuscript, Florida State University, Tallahassee, FL.
- Ent, M. R., Baumeister, R. F., & Tice, D. M. (2015). Trait self-control and the avoidance of temptation. *Personality and Individual Differences*, *74*, 12–15. <http://dx.doi.org/10.1016/j.paid.2014.09.031>
- Evans, J. S. B. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology*, *59*, 255–278. <http://dx.doi.org/10.1146/annurev.psych.59.103006.093629>
- Ferrante, D., Girotto, V., Stragà, M., & Walsh, C. (2013). Improving the past and the future: A temporal asymmetry in hypothetical thinking. *Journal*

- of Experimental Psychology: General*, 142, 23–27. <http://dx.doi.org/10.1037/a0027947>
- Fiske, S. T. (1993). Social cognition and social perception. *Annual Review of Psychology*, 44, 155–194. <http://dx.doi.org/10.1146/annurev.ps.44.020193.001103>
- Gilbert, D. T., Pinel, E. C., Wilson, T. D., Blumberg, S. J., & Wheatley, T. P. (1998). Immune neglect: A source of durability bias in affective forecasting. *Journal of Personality and Social Psychology*, 75, 617–638. <http://dx.doi.org/10.1037/0022-3514.75.3.617>
- Gilbert, D. T., & Wilson, T. D. (2007). Propection: Experiencing the future. *Science*, 317, 1351–1354. <http://dx.doi.org/10.1126/science.1144161>
- Glass, D. C., Singer, J. E., & Friedman, L. N. (1969). Psychic cost of adaptation to an environmental stressor. *Journal of Personality and Social Psychology*, 12, 200–210. <http://dx.doi.org/10.1037/h0027629>
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, 54, 493–503. <http://dx.doi.org/10.1037/0003-066X.54.7.493>
- Heidegger, M. (1927). *Sein und zeit* [Being and Time]. Tübingen, Germany: Max Niemeyer Verlag.
- Helzer, E. G., & Gilovich, T. (2012). Whatever is willed will be: A temporal asymmetry in attributions to will. *Personality and Social Psychology Bulletin*, 38, 1235–1246. <http://dx.doi.org/10.1177/0146167212448403>
- Hofmann, W., Baumeister, R. F., Förster, G., & Vohs, K. D. (2012). Everyday temptations: An experience sampling study of desire, conflict, and self-control. *Journal of Personality and Social Psychology*, 102, 1318–1335. <http://dx.doi.org/10.1037/a0026545>
- James, W. (1983). *The principles of psychology*. Cambridge, MA: Harvard University Press. (Original work published 1890)
- Laibson, D. (1997). Golden eggs and hyperbolic discounting. *The Quarterly Journal of Economics*, 112, 443–478. <http://dx.doi.org/10.1162/003355397555253>
- Laibson, D., Repetto, A., Tobacman, J., Hall, R. E., Gale, W. G., & Akerlof, G. A. (1998). Self control and savings for retirement. *Brookings Papers on Economic Activity*, 1998, 91–172. <http://dx.doi.org/10.2307/2534671>
- Masicampo, E. J., & Baumeister, R. F. (2011). Consider it done! Plan making can eliminate the cognitive effects of unfulfilled goals. *Journal of Personality and Social Psychology*, 101, 667–683. <http://dx.doi.org/10.1037/a0024192>
- May, R., Angel, E., & Ellenberger, H. F. (1958). *Existence*. New York, NY: Simon & Schuster.
- Monroe, A. E., Ainsworth, S., Baumeister, R. F., & Vohs, K. D. (2017). Fearing the future? Future-oriented thought produces aversion to risky investments, trust, and immorality. *Social Cognition*, 35, 66–78. <http://dx.doi.org/10.1521/soco.2017.35.1.66>
- Oettingen, G. (2014). *Rethinking positive thinking: Inside the new science of motivation*. New York, NY: Penguin Random House.
- Osvath, M. (2009). Spontaneous planning for future stone throwing by a male chimpanzee. *Current Biology*, 19, R190–R191. <http://dx.doi.org/10.1016/j.cub.2009.01.010>
- Petry, N. M., Bickel, W. K., & Arnett, M. (1998). Shortened time horizons and insensitivity to future consequences in heroin addicts. *Addiction*, 93, 729–738. <http://dx.doi.org/10.1046/j.1360-0443.1998.9357298.x>
- Phillips, J., & Cushman, F. (2017). Morality constrains the default representation of what is possible. *Proceedings of the National Academy of Sciences of the United States of America*, 114, 4649–4654. <http://dx.doi.org/10.1073/pnas.1619717114>
- Price, M. E., Cosmides, L., & Tooby, J. (2002). Punitive sentiment as an anti-free rider psychological device. *Evolution and Human Behavior*, 23, 203–231. [http://dx.doi.org/10.1016/S1090-5138\(01\)00093-9](http://dx.doi.org/10.1016/S1090-5138(01)00093-9)
- Redshaw, J., & Suddendorf, T. (2016). Children's and apes' preparatory responses to two mutually exclusive possibilities. *Current Biology*, 26, 1758–1762. <http://dx.doi.org/10.1016/j.cub.2016.04.062>
- Roberts, W. A. (2002). Are animals stuck in time? *Psychological Bulletin*, 128, 473–489. <http://dx.doi.org/10.1037/0033-2909.128.3.473>
- Rogers, T., Moore, D. A., & Norton, M. I. (2017). The belief in a favorable future. *Psychological Science*, 28, 1290–1301. <http://dx.doi.org/10.1177/0956797617706706>
- Rothbart, M., & Snyder, M. (1970). Confidence in the prediction and postdiction of an uncertain outcome. *Canadian Journal of Behavioural Science/Revue Canadienne des Sciences du Comportement*, 2, 38–43.
- Seligman, M. E., Railton, P., Baumeister, R. F., & Sripada, C. (2016). *Homo prospectus*. New York, NY: Oxford University Press.
- Shariff, A. F., Greene, J. D., Karremans, J. C., Luguri, J. B., Clark, C. J., Schooler, J. W., . . . Vohs, K. D. (2014). Free will and punishment: A mechanistic view of human nature reduces retribution. *Psychological Science*, 25, 1563–1570. <http://dx.doi.org/10.1177/0956797614534693>
- Shepherd, J. (2012). Free will and consciousness: Experimental studies. *Consciousness and Cognition: An International Journal*, 21, 915–927. <http://dx.doi.org/10.1016/j.concog.2012.03.004>

- Shepperd, J. A., Klein, W. M. P., Waters, E. A., & Weinstein, N. D. (2013). Taking stock of unrealistic optimism. *Perspectives on Psychological Science*, 8, 395–411. <http://dx.doi.org/10.1177/1745691613485247>
- Shin, J., & Ariely, D. (2004). Keeping doors open: The effect of unavailability on incentives to keep options viable. *Management Science*, 50, 575–586. <http://dx.doi.org/10.1287/mnsc.1030.0148>
- Sjåstad, H. (2017). *Short-sighted greed? Focusing on the future promotes (strategic) cooperation*. Unpublished manuscript, Norwegian School of Economics, Bergen, Norway.
- Sjåstad, H., & Baumeister, R. F. (2017a). *A two-stage model of prospection: Fast optimism, slow pessimism*. Unpublished manuscript, Norwegian School of Economics, Bergen, Norway.
- Sjåstad, H., & Baumeister, R. F. (2017b). *Moral self-judgment is stronger in the future than in the past*. Manuscript submitted for publication, Norwegian School of Economics, Bergen, Norway.
- Sjåstad, H., & Baumeister, R. F. (2018). The future and the will: Planning requires self-control, and ego depletion leads to planning aversion. *Journal of Experimental Social Psychology*, 76, 127–141.
- Sjåstad, H., Baumeister, R. F., & Ent, M. R. (2017). *Greener grass or sour grapes? How people value future rewards after initial failure*. Manuscript submitted for publication, Norwegian School of Economics, Bergen, Norway.
- Sniehotta, F. F., Schwarzer, R., Scholz, U., & Schütz, B. (2005). Action planning and coping planning for long-term lifestyle change: Theory and assessment. *European Journal of Social Psychology*, 35, 565–576. <http://dx.doi.org/10.1002/ejsp.258>
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103, 193–210. <http://dx.doi.org/10.1037/0033-2909.103.2.193>
- Tenney, E. R., Logg, J. M., & Moore, D. A. (2015). (Too) optimistic about optimism: The belief that optimism improves performance. *Journal of Personality and Social Psychology*, 108, 377–399. <http://dx.doi.org/10.1037/pspa0000018>
- Tetlock, P. E., & Gardner, D. (2016). *Superforecasting: The art and science of prediction*. New York, NY: Random House.
- Tetlock, P. E., Mellers, B. A., Rohrbaugh, N., & Chen, E. (2014). Forecasting tournaments: Tools for increasing transparency and improving the quality of debate. *Current Directions in Psychological Science*, 23, 290–295. <http://dx.doi.org/10.1177/0963721414534257>
- Thaler, R. H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of Political Economy*, 89, 392–406. <http://dx.doi.org/10.1086/260971>
- Tomasello, M. (2016). *A natural history of human morality*. Cambridge, MA: Harvard University Press. <http://dx.doi.org/10.4159/9780674915855>
- Tomasello, M., Melis, A. P., Tennie, C., Wyman, E., Herrmann, E., Gilby, I. C., . . . Melis, A. (2012). Two key steps in the evolution of human cooperation: The interdependence hypothesis. *Current Anthropology*, 53, 673–692. <http://dx.doi.org/10.1086/668207>
- Tormala, Z. L., Jia, J. S., & Norton, M. I. (2012). The preference for potential. *Journal of Personality and Social Psychology*, 103, 567–583. <http://dx.doi.org/10.1037/a0029227>
- Townsend, C., & Liu, W. (2012). Is planning good for you? The differential impact of planning on self-regulation. *Journal of Consumer Research*, 39, 688–703. <http://dx.doi.org/10.1086/665053>
- Uhlmann, E. L., Pizarro, D. A., & Diermeier, D. (2015). A person-centered approach to moral judgment. *Perspectives on Psychological Science*, 10, 72–81. <http://dx.doi.org/10.1177/1745691614556679>
- von Hippel, W., & Trivers, R. (2011). Reflections on self-deception. *Behavioral and Brain Sciences*, 34, 41–56. <http://dx.doi.org/10.1017/S0140525X10003018>
- Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, 39, 806–820. <http://dx.doi.org/10.1037/0022-3514.39.5.806>
- Zeigarnik, B. (1938). On finished and unfinished tasks. In W. D. Ellis (Trans. & Ed.), *A source book of gestalt psychology* (pp. 300–314). London, UK: Routledge, Trench, Trubner & Co. <http://dx.doi.org/10.1037/11496-025>
- Zullo, H. M., Oettingen, G., Peterson, C., & Seligman, M. E. P. (1988). Pessimistic explanatory style in the historical record: CAVing LBJ, presidential candidates, and East versus West Berlin. *American Psychologist*, 43, 673–682. <http://dx.doi.org/10.1037/0003-066X.43.9.673>

Received August 30, 2017

Revision received January 8, 2018

Accepted January 20, 2018 ■