Theoretical Contributions

POSSIBILITY STUDIES & SOCIETY

Possibility Studies & Society
2023, Vol. 1(4) 404–413

DOI: 10.1177/27538699231178180
journals.sagepub.com/home/pst
Sage

Pragmatic prospection, the matrix of maybe, uncertainty, and human agency

Roy F Baumeister
Constructor University Bremen, Germany

Abstract

The human agent exists in a world consisting not only of facts and stimuli but also of possibilities. The multiplicity of possibilities is most readily apparent in the future. Pragmatic prospection theory proposes that people think about the future to predict possibilities (e.g. choice points requiring decision) rather than final outcomes. This process can be analyzed into two heuristic steps. The first one envisions a desirable outcome and therefore is optimistically biased. The second step considers how to reach that outcome, including noting obstacles and difficulties, and is therefore less subject to optimistic bias. Many psychological processes are adapted for an environment in which uncertainty is a frequent aspect, and the psychology of dealing with uncertainty mixes simple, crude responses (e.g. conserve resources, be alert to all information) with complex and sometimes irrational ones. The advanced human form of agency, sometimes called free will, involves complex processes including mental simulation of future alternatives, integration across time, and application of meaningful categories and principles to the causation of behavior.

Keywords

agency, free will, future, possibilities, possibility, prospection, uncertainty

Human life is lived amid multiple, competing possibilities. The psychological study of possibilities has recently emerged as an exciting new field (e.g. Glaveanu, 2021). The challenge is to observe and explain how the mind deals with multiple possibilities, starting with first recognizing and understanding them, and ending with setting the body's muscles into action to execute and realize the possibilities it chose to pursue. That process often includes deciding *not* to enact certain possibilities.

The purposes of this article are as follows. First, I will provide some background and an overview of pragmatic prospection theory, which emphasizes dealing with the future as possibilities. It will propose two basic dimensions of future possibilities, corresponding to two different ways that the human agent deals with impending possibilities. It will then connect to research on uncertainty, which by definition invokes multiple possibilities, and it will close with consideration of implications for human agency, including so-called free will.

Psychology and the future: Origins of pragmatic prospection theory

My approach to the scientific problem of possibilities is shaped by a theory called pragmatic prospection (Baumeister et al., 2016), which emerged from several collaborations (Monroe et al., 2017; M. E. Seligman et al., 2013; M. Seligman et al., 2016). Its focus is on how people think about the future.

Corresponding author:
Roy F Baumeister, Constructor University Bremen, Germany.
Email: r.baumeister@uq.edu.au

Throughout its history, psychology has focused on studying the past more than the future. The causes of the present are presumably in the past. Psychology's first century featured two grand theories (Freud, 1965/1933; Skinner, 1938). Both of them explained the present based on the past, invoking either the reinforcement history or the Freudian childhood sequence of oral-anal-Oedipal stages. Later on, the rise of cognitive psychology has also focused heavily on the past. There are whole journals devoted to studying memory for the past. In contrast, thinking about the future is a minor part of what cognitive psychologists study. Moreover, the assumption is that present thinking is shaped by prior thoughts and experiences, with less emphasis on how present thoughts relate to the future.

But recent evidence indicates that ordinary people think much more about the future than the past, indeed around three times as much (Baumeister et al., 2020). Moreover, even when people do think about the past, the focus is on how the past has implications for the future.

Researchers have long documented the faults and flaws in memory. Then neuroscientists discovered that the brain regions that replay past events are the same ones that imagine future events (e.g. Schacter & Addis, 2007). That raises the question of which is their primary function, thinking about future or past? It is more useful for the animal brain to forecast impending events than to replay ancient history. The things that seemed like flaws in memory may actually be advantages for thinking about the future. For example, memory researchers have bemoaned how each time you replay a memory, it is slightly different, never reaching a final permanent version—but for imagining the future, it makes sense to think of it differently each time, because circumstances and possibilities change. Likewise, memory researchers found it regrettable that how you remember *past* events is biased by your present concerns and values—but it is appropriate to project the *future* in light of your current concerns and values. The way you project the future does and should change, and you need to use your current values to evaluate the different possible actions.

When psychologists finally got around to studying thoughts about the future, they naturally began with prediction. How accurately do people predict, and what things distort their predictions? Studies of prediction have yielded some valuable and fascinating findings. As one example, Buehler et al. (1994); also Buehler et al., 2010) had college students predict when they would turn in their theses. The predictions included their most likely best-guess prediction, an optimistic prediction assuming everything went well, and a worst-case prediction assuming everything went wrong. The researchers then followed up to record actual turn-in dates. On average, even the most pessimistic, worst-case scenario predictions were still optimistically biased: Students turned in their thesis about a week later than the worst-case prediction (and 3 weeks behind their "most realistic" prediction). People mainly had this optimistic bias when predicting their own future. The bias vanished when people predicted when others would finish their assignments.

Psychologists have learned much from studying prediction (e.g. Tetlock & Gardner, 2016; Tetlock et al., 2014). But is prediction the main way people think about the future? The alternative my group has developed is pragmatic prospection theory (e.g. Baumeister et al., 2016; Baumeister et al., in press). The essence of that is that people think about the future to prepare for what they should do. They are not so much predicting how things will turn out but anticipating the choice points and crossroads, where things could go in different directions, so they can prepare to do their best to steer things toward outcomes that will be better for themselves, their loved ones, their employers. One thinks about the future so that when the future becomes the present, one will know what best to do or say.

Another way of putting this is that people think about the future not so much to predict actualities but rather to predict *possibilities*. The

important thing is to anticipate future situations in which things could go in different directions, so as to be ready. Predicting how things will turn out in the end has some interest but does not have as much pragmatic utility. The famous remark by economist John Maynard Keynes that "In the long run, we are all dead" epitomizes the pragmatic uselessness of long-term prediction. Instead, it is useful to predict upcoming points at which the agent must choose and perform amid multiple alternatives.

Thus, the agent must recognize the set of possibilities (the "matrix of maybe"; see next section). The human mind can mentally simulate the various possibilities (not necessarily accurately), evaluate the outcomes, and make a rational, self-serving decision about how to act.

The pragmatic aspect is evident in people's everyday thoughts. We programed several 100 people's phones to beep at random points during the day, whereupon they recorded their most recent thought and answered some questions about it. In this way, we obtained a large sample of people's everyday thoughts (Baumeister et al., 2020). As already noted, they think more about the future than the past. Moreover, it was mainly the near future, in which decisions must be made and actions taken. Another sign of pragmatism was that the majority of thoughts about the future involved planning. Planning is pragmatic: What do you need to do, to reach your goals? At what points will it be helpful to know how to act, what to say, what to choose? Preparing for those points is the most helpful and adaptive aspect of thinking about the future.

The pragmatic viewpoint is also relevant to thinking about one's future death. An influential theory has asserted that a defining and unique aspect of the human condition is the knowledge that oneself will die, and that this inspires intense anxiety and fear that people seek to quell by various distracting or self-deceiving activities (Becker, 1973; Pyszczynski et al., 1997). Our study of everyday thoughts included asking people whether their most recent thought was about death. Death was reported for about half of 1% of thoughts, thus hardly ever. Moreover, even those rare thoughts of death were often rated as situated in the past, so people were not thinking about their own death (which by definition must be in the future, for anyone who is alive now). The inevitability of one's death is not part of conscious mental life.

To be sure, the Terror Management theorists have a Freudian sort of explanation: Death is so terrifying that people simply repress it. It is difficult to test that with our data. Nevertheless, pragmatic prospection theory has a different explanation. Mortality is not a pragmatic concern, precisely because you cannot do anything about it. It's not worth thinking about. It's not a possibility, it's a certainty.

Instead, pragmatic prospection theory would propose that people would mainly think about possibilities of death, when these intrude into their situation. A possible but avoidable death would evoke plenty of pragmatic thoughts, aimed mostly at avoiding it.

The test case, which remains for future research, would be a particular threat of imminent possible death. If the inevitability of death causes anxiety and thereby suppresses thoughts, then when the threat of death suddenly increases (e.g. a medical test suggests one might have a fatal disease), people should repress it all the more. In contrast, if the pragmatic theory is correct, then people would think a great deal about this possible death, so as to prevent it from happening.

Future as matrix of maybe

People see the future as multiple possibilities, and these are organized (hence the term "matrix"). The organization may be quite logical and systematic in an objective sense—while the organization in the agent's mind may be much more chaotic, and indeed people may be unaware of some possibilities and may neglect to take others seriously. A new employee, for example, may have to choose among assorted plans for health care and retirement savings,

and these have their own logic as to what possibilities they open and foreclose down the road. But the employee may not appreciate these and indeed may not understand or even consider some of them. The organizational structure also entails that each possibility chosen in the present or near future may lead to further sets of future possibilities. For example, you can choose a career in law, but you might fail, indeed at multiple levels (getting accepted to law school, graduating with law degree, passing the bar, having a thriving practice). The traditional way of mapping decisions as a "decision tree," with branches leading in different directions to other sets of branches, captures this well.

Many animals can think a few seconds or even minutes into the future, mostly in the form of expectancies. Humans are remarkably different not only in their ability to think far ahead in time, but also to imagine multiple alternative futures. Recent experiments suggest this ability to think about multiple alternative possibilities is limited to humankind (Redshaw & Suddendorf, 2016).

Many research findings illuminate the idea that the future is a matrix of maybe (Baumeister et al., 2018). People act as if the future is more changeable than the past, even when it is beyond their control. For example, people will bet more on a future event (e.g. a soccer game) than one that has already occurred, even though their subjective ignorance of the outcome is the same. Other work shows that when people focus on the future, they look to things that they might control, whereas in discussing the past, they emphasize causes outside of their control. Anticipated emotions seem to have more consistent influence on behavior—and more consistently positive influence—than currently felt emotions. Moral judgments are often about whether the person should have acted differently, which thus places it firmly in the context of multiple possibilities. Moreover, there are strong arguments that moral judgments are often future-oriented, given the basic concern with predicting how other people will act in the future and whether they can be trusted.

Two steps in pragmatic prospection

If thinking about the future is basically pragmatic, how would that go? Pragmatic prospection theory proposes there are two essential but very different steps (Baumeister et al., 2016). (These are heuristic steps as a general pattern, not a rigid dichotomy.)

Imagine an animal that is newly able to think about the future. What would be most adaptive, in terms of improving its prospects for survival and reproduction? Two different kinds of thoughts would seem helpful, and these constitute the two steps. First, the creature would want to think about what would be the best outcome, as in what it wants. Second, and more complicated, would be thoughts on how to bring about that good outcome.

These two steps have different implications. Thinking what you would ideally like is inherently optimistic. You want a best-case scenario, or at least a pretty-good-case. But when you then start thinking about how to get there, you recognize the problems and obstacles. Anticipating those makes it useful to avoid optimistic illusions and be realistic, or even cautious.

The two-step theory was stimulated by some surprising findings. An extensive research literature indicates that people make broadly optimistic predictions about their future (Shepperd et al., 2013; Weinstein, 1980). Monroe et al. (2017) reasoned that optimism should move people toward high-risk-high-reward decisions, away from the play-it-safe strategy that would seemingly appeal to pessimists. Accordingly, they randomly assigned people to think either about the present or the future. Then participants made various decisions between risky-high-reward and play-it-safe options. After all, if there's a chance for either a big gain or loss, as opposed to playing it safe, one would expect the optimists to take the gamble while the pessimists play it safe, right? But Monroe et al. found exactly the opposite. When people adopted a future mindset, they became cautious, not risk-seeking.

The evidence for optimistically biased predictions is strong. But Monroe et al. (2017) also repeatedly found that prolonged thinking about the future led to caution. Instead of arguing that one or the other must be mistaken, Baumeister et al. (2016) proposed that both phenomena were genuine—but occur in sequence. The first, top-of-the-head response tends to be optimistic, while the second is more realistic. To caricature: First, dream big. Second, get real.

Evidence in favor of the two-step model is covered in another article in this special issue (Sjåstad & Bø, in press). Briefly, across many experiments, participants were asked to make predictions about their future, while sitting at a computer. They were presented with a timer. By random assignment, half were told to make their responses within a brief period, such as 10 or 20 s. The others were told not to respond until after the same number of seconds. Over and over, people's fast predictions were much more optimistic than the slowed-down ones. A brief delay was enough to enable the second step to get started at recognizing the potential roadblocks and problems. Thus, the first, fast response focuses on the best-case outcome, while the second, slower response is daunted by the obstacles.

The two steps involve somewhat different kinds of possibility. The first step focuses on what one wants to happen. That is after all highly useful and adaptive for a simple brain. If your goal is to escape, or to have sex, or to find something to eat, then it helps for your brain to have some sense of that. Once it knows the goal it can start plotting a pathway thither. Such planning reveals that many plans are worse than others, and so one must find a way to deal with the problems, setbacks, and obstacles.

Two dimensions of possibility

A theory of possibilities for human action has to start mapping the space, as in, how are possibilities linked among each other. I propose to start with two very important dimensions, which are highly relevant to theories about free will and agency. I think of them as horizontal and vertical. The horizontal dimension is like cards laid out on a table, or ordering off a restaurant menu, or a fork in the road ahead—you can pick any one. It's up to you. In contrast, the vertical dimension is like winning or losing. Wanting or choosing to win is not enough, and instead of picking what you want, you need to make yourself do a good job. The agent does have some control, and pragmatically it is important to prepare to perform one's best in important situations, such as by practicing one's sport or musical instrument, studying for a test, or rehearsing a presentation.

The difference is in where the value judgment originates. On the vertical dimension, as in success/failure, the value judgment is built into the situation: Everybody agrees that success is better than failure, winning better than losing. On the horizontal dimension, it originates inside the agent (what do you want to eat?). Another difference is that the immediate outcome is largely, even entirely under the agent's control on the horizontal dimension, but on the vertical dimension there is no guarantee of getting what you want. Even if you perform superbly, your opponent might outperform you and win the match. Still, you have some control over your performance quality, and you can exert that to improve your chances. In an important sense, you exert agential control to change the possibilities (i.e. improve the odds of success), even though you cannot choose the outcome you want as with horizontal choices.

Conscious thought is an internally generated simulation, even of the here and now. Crucially, the human mind simulates possibilities. It imagines different future situations, different possible responses to the same possible situation, and different possible outcomes. It tries to think how things would turn out, and how they would feel. From that information, the mind decides what to do and initiates action.

It is important to stipulate that the mind is not merely inventing spurious possibilities. This, to be sure, might be how determinists view

the matter, given that they think alternative possibilities were never really possible. But the pragmatic approach emphasizes that the world offers multiple possibilities, and the human mind can best capitalize on these by understanding them and thinking about them (so as to choose optimally). To be sure, the mind can be mistaken. It may simulate possibilities that do not exist, such as when one ponders and decides to buy an item only to learn that it has already been sold. It may be mistaken about what is possible in other ways. Nevertheless, I assume most people are reasonably accurate at understanding most of the possibilities they face, most of the time—and this understanding is a key to successful, pragmatic action.

Whether the mind simulates a horizontal or a vertical matrix of maybe leads to different kinds of preparations. The horizontal dimension is just a matter of choice and entirely up to the agent. In that situation, the agent has to think about what decision to make. The agent can simulate the different options and how they would end up. The restaurant diner might see the fish option on the menu and imagine what it will be like, and then the diner imagines eating it while wishing he had ordered the fancy hamburger instead. The options have different values, but the agent is free to decide what those values are, based on mental simulations and preferences. It comes down to what you want, for your own best benefit. (That can include your desire to do what's best for others.)

In sharp contrast, the vertical dimension is not up to the agent to choose. Whether the agent succeeds or fails has consequences, and the mind can mentally simulate (imagine) them. Success is better than failure. But this time the agent's choice is not enough to dictate the outcome. Instead, the agent has to focus on how to perform well. Part of the outcome is beyond one's control. In a tennis match, you can do everything right but might still lose if your opponent happens to perform at a superior level. Nevertheless, in the aggregate across one's whole life, doing your best over and over will increase your good outcomes, and your life will be happier.

Uncertainty and multiple possibilities

For several years now, Alquist and I have been reading the research literature on uncertainty and trying to figure it out (see Alquist & Baumeister, 2022). Uncertainty is a close cousin of multiple possibilities. Certainty means there is only one possibility. Uncertainty means more than one.

It is clear there are two separate kinds of uncertainty, so you can have either, both, or neither. The first type is uncertainty in your mind (subjective uncertainty): you know there is something that you don't know. The other kind of uncertainty is out in the situation (objective uncertainty): The outcome lies in the future and has not been determined yet. The difference between the two kinds of uncertainty resembles the difference between yesterday's versus tomorrow's basketball game. You might be uncertain as to who won yesterday, but someone definitely did. The winner of tomorrow's game, in contrast, remains to be decided.

These have different effects. Subjective uncertainty calls for not taking action and searching for more information. It would be best to find out the facts before doing anything, and indeed there is nothing you can do about things already settled. In contrast, when there are multiple objective possibilities, you need to take action. That's what agency is for, to function in situations with multiple possible outcomes, so as to steer events toward good outcomes. Uncertainty also seems to be a cue to conserve resources, including effort and willpower.

Another general impression from our extensive literature review is a mixture of good and bad news, so to speak. Responses to uncertainty seemed broadly and crudely adaptive—but not rationally optimal. Both require explanation. One powerful recent theory is that uncertainty and anxiety are the default (Brosschot et al., 2016). It's not that one starts from assuming safety and the occasionally learns to respond to threat. (Threat is the possibility, not certainty, that something bad will happen.) Instead, safety is what is learned. The basic state is anxiety over

uncertainty, and only when you really feel safe does the brain damp down these bad feelings of anxiety and stress.

That would explain why animals seem able to respond to uncertainty even though most evidence suggests they cannot really understand or even think it. Recent evidence suggests that only the human mind can prepare for multiple alternative possibilities – unlike even our smartest animal relatives (Redshaw & Suddendorf, 2016). But if life starts out amid uncertainty, animal brains would have ways to cope with it. The responses are simple but would be often effective.

For example: Uncertainty means knowing one lacks information. The optimal response is to seek and obtain that information. Sure enough, uncertainty stimulates searching for information. But it turns out uncertainty motivates seeking out all sorts of information, even irrelevant information, even useless and unpleasant information, and so forth (see Alquist & Baumeister, 2022, for review). It is probably easier to design a simple animal brain to respond to uncertainty by making it become alert to all sorts of new information—as opposed to designing it to seek out exactly the information it needs, which requires plenty of mental activity (forming a concept of what one is looking for, analyzing the situation into where to look for useful information).

Why so-called free will evolved

Free will is most commonly and easily defined as the ability to act differently in the same situations. It is thus rooted in possibilities. My understanding of free will has been much influenced by List's (2019) philosophical analysis of why free will is real.

I have had many conversations with psychologists who disbelieve in free will, and likewise many with others who accept it. Surprisingly, they largely agree about how the human mind and brain control the body's behavior. In other words, they don't disagree about how behavior happens. Moreover, and crucially, they also agree that how human beings guide their behavior is vastly and qualitatively different from what the other apes, or indeed all other animals, do.

They merely disagree as to whether this remarkable, evolutionarily new system for controlling action, deserves to have the name "free will." And the disagreement is mainly because they are using different definitions of free will.

In my view, the proper scientific problem is to understand how this radically new system of controlling behavior evolved, and how it functions. Whether it qualifies as free will, or (more likely) in which senses it does or doesn't, is not our job, and we should leave that to the philosophers.

The traits that make us human, that constitute the human essence, are adaptations to enable us to sustain culture (Baumeister, 2005). Culture enables us to create more resources, so we survive and reproduce better. These essentially human traits derive from what helps us participate in culture—a giant system of cooperation and communication that produces more resources, thereby increasing the quantity and quality of life. At a basic biological level, that's what it's all about.

One source of confusion in the free will debate is the stumbling block that somehow all prior causes combine to produce the present, but how does a physical being acquire the possibility to split the stream of causality into different directions? Many scientists think that if the various causes combined to bring the person to this particular point—and yet the person can still act in different ways—then the person must contain some kind of inner mental power to produce different outcomes from the same causes. One example might be some indeterminate mental process, such as a random action generator. But that is perhaps the wrong way to think about it—the wrong way to frame the problem. The crucial point is that the multiple possibilities are already out there in the environment. The power of agency evolved to capitalize on that—to steer events toward more favorable outcomes. Agency operates in an

environment in which various things might happen but also might not happen.

For our project of understanding possibilities, the key point, again, is that possibilities exist in the world. Determinists deny what I call "the reality of mere possibility," that is, something might be genuinely possible but then not come true. However, the reality of mere possibility seems indispensable to building a sound psychology of how the human mind and agent function.

Concern with moral reputation is a powerful driving factor in the evolution of free will. Remember, the traits that make up the essence of being human – what makes us really human—are mostly the result of biological adaptations to make culture possible. These traits are shaped by what makes the social system work best.

Morality is an important one of those traits. (And moral responsibility is central to all serious discussions of free will.) Social systems work better when people are morally good. Imagine a culture whose moral values were precisely the opposite of the Ten Commandments, thus obligating people to kill, steal, lie under oath, disrespect their parents, bang other people's spouses, reject the dominant religion, and so on. How could such a society flourish, as in producing more resources so people thrive and the population increases?

The evolutionary pressure probably went this way (this is speculation informed by scattered evidence). There is multi-level selection, but it has to work for the individual. Why would an individual adopt morality—especially given that moral duty requires you to abstain from tempting possibilities? But morality asks people to do what is best for the social system, even though it sometimes is not the immediately best option for the individual. This is presumably repaid by the benefits of society. Even if you can't always do what you want, you are better off by being part of this society. Maintaining a good moral reputation, by visibly doing what people agree is right, helps you be a respected member of society and gets you access to some of its resources and other benefits. (As a result, you survive and reproduce better.)

In essence, humankind evolved to cooperate, to work together to produce more resources. To flourish, each individual needs to cooperate with others, and, crucially, to attract others to cooperate with him or her. But the brain wonders, exactly how should I behave in order to attract future cooperators? Morality provides the blueprint. If you behave in a morally responsible and virtuous manner, others will cooperate with you, more than otherwise. Thus, you benefit in the long term by behaving morally, and moral guidelines are very helpful for decision making among multiple possibilities, especially when illicit temptations are on offer.

So free will—also known as the advanced and uniquely human mental executive system of self-regulation, decision making, and general action control—evolved to help the individual animal flourish as part of a flourishing society. Again, when many people strive to maintain good moral reputations, that benefits the system as a whole and then also rewards the virtuous individuals within it.

The human agent, sometimes called free will, operates in an environment full of alternate possibilities. Human evolution included significant upgrades in the mind's ability to recognize these alternative possibilities, to understand and evaluate them in multiple ways, and to use those complex thoughts to guide behavior. Regardless of whether we call this upgraded set of mental powers "free will" or something else, it enables a vast improvement in how human beings become able to thrive amid multiple possibilities.

Conclusion

The human agent lives and acts in a world defined in substantial part by multiple sets of possibilities. Analyzing behavior as a simple response to a stimulus was a heuristically useful starting point for scientific psychology, but it is woefully inadequate to furnish an adequate account. For the human agent, at least, what is there is experienced in the context of alternative

possibilities. These include counterfactual simulations of past events, confronting alternative behavioral options in the present, and the future as a multi-maybe matrix.

The present approach to possibilities rests on the school of thought known as pragmatism, which in psychology was pioneered by James (1890/1950). His injunction that the doing is the purpose of thinking has continued to resonate and is a main reason we denoted our theory as focusing on pragmatic prospection. Although people's minds may wander far and wide through possible future events, the majority of thinking about the future involves preparing for action in the near future. Appraising imminent possibilities and preparing to deal with them is a vital part of human free will (Baumeister, forthcoming) and a highly adaptive set of mental functions.

Author's note

A preliminary version of this was presented at the Humble Approach Initiative conference on possibilities, held in Dublin, Ireland, September, 2022.

Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received no financial support for the research, authorship, and/or publication of this article. A preliminary version was presented at a conference sponsored by the John Templeton Foundation, which supported travel expenses and paid an honorarium.

ORCID iD

Roy F Baumeister https://orcid.org/0000-0003-1413-3296

References

Alquist, J. L., & Baumeister, R. F. (accepted pending revisions). Dealing with uncertain situations. *Journal of Positive Psychology*.

Baumeister, R. F. (2005). *The cultural animal: Human nature, meaning, and social life*. Oxford University Press.

Baumeister, R. F. (forthcoming in 2024). *The science of free will*. Oxford.

Baumeister, R. F., Hofmann, W., Summerville, A., Reiss, P. T., & Vohs, K. D. (2020). Everyday thoughts in time: Experience sampling studies of mental time travel. *Personality and Social Psychology Bulletin*, *46*, 1631–1648. https://doi.org/10.1177/0146167220908411

Baumeister, R. F., Kellerman, G., Reece, A., Ruscio, A. M., & Sjåstad, H. (in press) Pragmatic prospection: Theory, research, and practice. In A. Elliot (Ed.), *Advances in motivation science*.

Baumeister, R. F., Maranges, H. M., & Sjåstad, H. (2018). Consciousness of the future as a matrix of maybe: Pragmatic prospection and the simulation of alternative possibilities. *Psychology of Consciousness Theory Research and Practice*, *5*, 223–238. https://doi.org/10.1037/cns0000154

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. https://doi.org/10.1037/gpr0000060

Becker, E. (1973). *The denial of death*. Academic Press.

Brosschot, J. F., Verkuil, B., & Thayer, J. F. (2016). The default response to uncertainty and the importance of perceived safety in anxiety and stress: An evolution-theoretical perspective. *Journal of Anxiety Disorders*, *41*, 22–34.

Buehler, R., Griffin, D., & Peetz, J. (2010). The planning fallacy: Cognitive, motivational, and social origins. *Advances in Experimental Social Psychology*, *43*, 1–62. https://doi.org/10.1016/S0065-2601(10)43001-4

Buehler, R., Griffin, D., & Ross, M. (1994). Exploring the "planning fallacy": Why people underestimate their task completion times. *Journal of Personality and Social Psychology*, *67*, 366–381.

Freud, S. (1965). *New introductory lectures on psychoanalysis*. (J. Strachey, Trans.) Norton (Original work published 1933).

Glaveanu, V. P. (2021). *The possible: A sociocultural theory*. Oxford.

James, W. (1890). *The principles of psychology*. Dover (Original work published 1950).

List, C. (2019). *Why free will is real*. Harvard.

Monroe, A. E., Ainsworth, S. E., Vohs, K. D., & Baumeister, R. F. (2017). Fearing the future? Future-oriented thought produces aversion to risky investments, trust, and immorality. *Social Cognition*, *35*, 66–78.

Pyszczynski, T., Greenberg, J., & Solomon, S. (1997). Why do we need what we need? A terror management perspective on the roots of human social motivation. *Psychological Inquiry*, *8*, 1–20.

Redshaw, J., & Suddendorf, T. (2016). Children's and apes' preparatory responses to two mutually exclusive possibilities. *Current Biology*, *26*(13), 1758–1762.

Schacter, D. L., & Addis, D. R. (2007). The ghosts of past and future: A memory that works by piecing together bits of the past may be better suited to simulating future events than one that is a store of perfect records. *Nature*, *445*, 27.

Seligman, M., Railton, P., Baumeister, R., & Sripada, C. (2016). *Homo prospectus*. Oxford University Press.

Seligman, M. E., Railton, P., Baumeister, R. F., & Sripada, C. (2013). Navigating into the future or driven by the past. *Perspectives on Psychological Science*, *8*, 119–141. https://doi.org/10.1177/1745691612474317

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. https://doi.org/10.1177/1745691613485247

Sjåstad. H., & Bø, S. (in press). *Mental simulation of future possibilities: Preparing for action, or protecting the self?* Possibility Studies and Society.

Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. Appleton-Century.

Tetlock, P. E., & Gardner, D. (2016). *Superforecasting: The art and science of prediction*. Random House.

Tetlock, P. E., Mellers, B. A., Rohrbaugh, N., & Chen, E. (2014). Forecasting tournaments: Tools for transparency and the quality of debate. *Current Directions in Psychological Science*, *23*, 290–295. https://doi.org/10.1177/0963721414534257

Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, *39*, 806–820. https://doi.org/10.1037/0022-3514.39.5.806