

# Feelings of the future

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**Affective forecasting refers to the capacity to predict future feelings. Humans have been found to exhibit systematic affective forecasting biases that involve overestimation of the intensity and duration of future feelings. Although recent research has elucidated the proximate mechanisms underlying our ability to predict future feelings, explanations concerning the potential adaptive significance of these biases have attracted little attention. Here we consider the function of affective forecasts as signals of biological value, drivers of goal pursuit, and tools for eliciting collaboration. Although affective forecasting biases can have significant costs, for instance in terms of one's pursuit of happiness, they may ultimately serve adaptive functions.**

## The future in mind

One of the most remarkable capacities of the human mind is its ability to transcend the physical constraints of space and time. Most of the time that we are disengaged from the present is spent thinking about the future [1–3]. Thoughts about the future are not merely incidental; they tend to be self-relevant and are routinely used to guide behavior [3–6]. Episodic foresight refers to the mental construction of future scenarios and the organization of current actions in light of such constructions and represents a powerful evolutionary achievement [7]. By allowing us to plan and prepare, episodic foresight enables us to prudently take advantage of opportunities and manage risks [8]. We propose that feelings, projected forward, are a key constituent of episodic foresight by enabling us to drive action in ways that confer fitness benefits (see [Glossary](#)).

## Feelings signal fitness value

Thoughts about the future frequently evoke strong feelings [9]. Feelings can serve to signal reward or punishment contingencies and degrees of risk or uncertainty associated with future events, especially with future outcomes in the course of goal-directed decision making [10,11]. Individuals with an impaired ability to integrate affective information into future-oriented thought processes tend to make detrimental and at times disastrous decisions, both in the laboratory and in the real world [12–14]. We can differentiate between potentially life-promoting and life-threatening future scenarios by how they make us feel when we think about them. By signaling biological value, feelings play an

important role in enabling us to decide auspiciously [15]. However, to take full advantage of this capacity one must also be motivated to adhere to a particular course of action, often in the face of risk and competing temptations. Anticipation of strong future feelings can help drive future-directed actions.

## Proximate and ultimate perspectives on affective forecasting

Affective forecasting refers to the capacity to predict one's feelings in response to a future event. Although people are generally capable of distinguishing between future events that will incite positive or negative feelings [16], they tend to make two characteristic affective forecasting errors, collectively referred to as the impact bias, that involve overestimating the intensity and the duration (i.e., magnitude) of their affective reactions to future events [17]. Primary support for the impact bias comes from longitudinal studies. For example, people mistakenly think that taking revenge will make them happier than it actually does [18], that (perceived) certainty about the occurrence of a positive future event will lead to more happiness than uncertainty about the same outcome [19,20], and that they should trust their own forecasts rather than relying on similar experiences of closely connected social others although the latter are usually more indicative of how they will feel [21]. Across a range of studies and contexts, individuals have consistently been found to overestimate the magnitude of their feelings following an anticipated event ([16,17], but see [22–24]). Whether about personal relationships, job security, or presidential elections, forecasts of how we expect to feel following the occurrence of event X tend to be of greater magnitude than how we actually feel following the occurrence of X, regardless of whether the event is expected to be positive or negative. The impact bias occurs because the future is essentially uncertain. Research suggests that people tend to base their forecasts on insufficient or misremembered information and then focus extensively on the

## Glossary

**Current Utility:** the current function of a trait in terms of fitness value.

**Delay discounting:** a decline in one's preference for a reward as it increases in temporal distance (also referred to as temporal discounting).

**Fitness:** an organism's ability to survive and reproduce and hence to contribute to the gene pool of the next generation.

**Impact bias:** the tendency to overestimate the intensity and duration of a feeling following a future event.

**Proximate:** a level of explanation that focuses on how a trait works by considering its mechanisms and development (ontogeny).

**Ultimate:** a level of explanation that focuses on how a trait came to take its current form by considering its phylogenetic history and its adaptive significance.

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specific event in question (or some of its key features), which leads to an overweighting of the impact of those variables on future feelings [25–29].

It has been proposed that the fundamental role of affective forecasting, and the fundamental role of foresight in general, is to assist in predicting paths that are most likely to guide one toward happiness and well-being [16,17]. However, the impact bias shows that humans are not very good at predicting the magnitude of their future feelings, which can lead individuals to decide and subsequently behave in ways that do not optimize happiness and well-being [30]. For instance, newlywed spouses typically predict increases in relationship satisfaction over time and yet experienced satisfaction declines [31]. Those who predict greater increases in satisfaction experience steeper declines. However, unhappy couples sometimes choose to prolong relationships based on the (mis)prediction that dissolution will result in even more unhappiness [25,32]. Considering that people frequently make decisions based on such predictions, the impact bias is costly and ought to be redressed [33].

Although this argument makes sense from an individual, proximate point of view, an ultimate perspective [34–37] may shed a very different light on these pervasive (mis)predictions (Table 1, first column). Ultimate explanations focus on how human beings came to project their feelings into the future the way that they currently do. Natural selection (unfortunately) does not favor traits that maximize happiness or well-being *per se*. Pleasure and pain, happiness and sadness are important insofar as they encourage fitness-relevant behavior [10,38]. Hedonic outcomes do not necessarily promote fitness and too much happiness may even prove detrimental to fitness [39,40]. Ultimately, it matters whether characteristically biased affective forecasting promotes our contribution to the gene pool of future generations, not whether it makes us happy.

We cannot travel back in time and directly test how affective forecasting and its associated biases evolved, but we can empirically examine their current utility in terms of survival and reproduction. Are the consequences of characteristically biased affective forecasting, on average, detrimental, neutral, or beneficial to fitness? Given its preponderance and the fact that the impact bias largely persists despite the numerous opportunities that we have to learn from our (mis)predictions [41] – perhaps largely because we misremember our initial forecasts [42] – it is unlikely that it generally poses a serious threat to fitness.

Thus, the potential ultimate benefits of characteristically biased affective forecasting deserve more attention.

### Feelings are motivational

The ultimate function of affective forecasting may not simply be to accurately predict future feelings, but rather to motivate action in ways that have fitness benefits. Although it has been acknowledged that the impact bias may have motivational benefits [17,43], a much stronger emphasis has been placed on its costs [17] and on the benefits of pre-experiencing future episodes for delaying immediate gratification [43]. Studies specifically investigating the potential benefits of the impact bias have been few and far between.

To drive effortful action and resistance to challenges in the face of uncertainty, one could benefit from exaggerating the expected hedonic value of achieving a temporally displaced outcome (or the hedonic cost of failing to do so). Substantiating this, it has been found that individuals capable of influencing the outcome of an event from which they stand to be rewarded generate more extreme (and therefore less accurate) affective forecasts [44]. In one study, participants were told that they would be competing against an opponent in a motor skill task that measured the frequency of key presses over one minute. Participants in the ‘before’ condition produced forecasts for how happy they expected to be to beat the opponent before performing the task, whereas participants in the ‘after’ condition made their forecasts after performing the task (but before being informed of the outcome). Outcome measures were then obtained. Consistent with a motivational account of the impact bias, those in the before condition produced more extreme forecasts in preparation for facing the opponent. Further support comes from two studies in which individuals who generated more extreme affective forecasts exerted more effort than individuals with more moderate affective forecasts in performance-based tasks [44,45]. Both studies relied on a similar paradigm: participants were manipulated to generate more or less extreme forecasts and then administered cognitive tests. In both studies, those who generated more extreme forecasts outperformed the others.

One could also benefit from exaggerating the negative consequences of a future outcome (i.e., a negative impact bias), albeit in a different way. For instance, anxious individuals who exhibit a negative impact bias for threat-related events also demonstrate an increase in delay discounting of future rewards [46–50]. In light of

**Table 1. Complementary perspectives on affective forecasting based on Nobel laureate Niko Tinbergen’s (1963) famous distinction between four questions that need to be answered for a comprehensive explanation of a trait [34]**

Proximate (explanations that focus on how people project their feelings into the future)	Mechanism How do we forecast our feelings and make persistent errors? What cognitive and neural mechanisms underlie affective forecasting and associated biases?	Development How do affective forecasting and associated biases develop? How do these manifest differently throughout the human lifespan?
Ultimate (explanations that focus on how people came to project their feelings into the future in the way they do)	Function What is the current utility of affective forecasting and associated biases? How did variations in affective forecasting interact with past environments to bring about its current form?	Evolution What is the evolutionary origin and phylogenetic history of affective forecasting and its associated biases? Which species, if any, share homologous capacities?

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