Affective Forecasting

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Abstract

When making decisions about their health and wellbeing, people often try to anticipate how happy or unhappy a potential outcome will make them. The greater the predicted emotional impact, the more effort and resources people devote to attaining a positive outcome or avoiding a negative one. Thus, predicting emotion, known as "affective forecasting," plays a major role in decision making, and inaccurate predictions can lead to poor choices. This entry reviews when and why people show biases in affective forecasting, over- or underestimating the emotional impact of future events, with an emphasis on forecasts related to health. Understanding sources of accuracy and bias in affective forecasting can help healthcare professionals guide people as they confront choices about genetic testing, cancer screening, vaccination, end of life medical provisions, and other important health related issues.

Keywords: affective forecasting, emotion, health, decision making, judgment, prediction, bias, well-being

Affective Forecasting

People often face decisions that have major repercussions for their health and well-being. They must decide whether to undergo elective surgery or risk developing a hereditary disease, whether to take a vacation or put their money into savings, whether to break up with their partner or stay put. To make such decisions, people do not merely tally objective costs and benefits. They also try to anticipate how happy or unhappy potential outcomes will make them. They select options that they expect will make them happy and avoid those that they expect will make them miserable. The greater the anticipated emotional impact of an outcome, the more effort people devote to attaining or avoiding it. Thus, predicting emotion, known as "affective forecasting," plays a major role in decision making, and inaccurate predictions can lead to poor choices (Loewenstein, 2007). This entry reviews when and why people show biases in affective forecasting, over- or underestimating the emotional impact of future events, with an emphasis on forecasts related to health.

Affective forecasting and health

The accuracy with which people predict their future feelings has powerful implications for understanding a wide range of health issues including decisions about vaccination (Chapman & Coups, 2006), addiction (Loewenstein, 2005), genetic testing and cancer screenings (Peters, Laham, Pachter, & Winship, 2014), engaging in risky sexual behaviors (Ariely & Loewenstein, 2006), and end of life medical decision making (Ditto, Hawkins, & Pizzaro, 2005). In fact, people's expectations about future feelings can even be the strongest predictor of their decisions about health. For example, university employees' decisions to get a flu shot were predicted more strongly by their anticipated worry and regret should they later come down with the flu than by their perceived risk of actually getting the flu (Chapman & Coups, 2006).

Physicians also need to understand how predicted emotion influences patients' decisions and that these predictions can be inaccurate. Moreover, physicians themselves may be biased when predicting how their patients will respond emotionally to health-related outcomes. People can be subject to the same types of errors when forecasting others' emotional reactions as they are when forecasting their own (see Peters et al., 2014 for review). Policy makers evaluating the value and ethics of administering diagnostic tests for incurable conditions, such as Huntington's disease, can also benefit from an understanding of biases in affective forecasting. People's views about the value of such tests often depend on beliefs about the emotional impact of receiving positive test results. Thus, it is critically important for patients, healthcare providers, and policy makers to understand when and why predictions about future emotion are likely to be inaccurate and result in misguided or unsatisfying decisions.

Overestimating the emotional impact of future events

In pioneering work on affective forecasting, Timothy Wilson, Daniel Gilbert, and their colleagues have shown that whether people are predicting their reaction to the break-up of a relationship, achieving or being denied tenure, or the victory or loss of their favored sports team, they have a persistent tendency to overestimate the emotional impact of future events – an error referred to as the "impact bias." People expect positive events to have a greater positive emotional impact than those events later turn out to have. They expect negative events to be more devastating than they later turn out to be (e.g., Gilbert, Pinel, Wilson, Blumberg & Wheatley, 1998; Wilson & Gilbert, 2003). People have also been shown to overestimate the emotional impact of a wide range of medical conditions including paraplegia, hemophilia, kidney disease, and diabetes. People awaiting HIV test results overestimate how happy they will feel if the test comes back negative and how distressed they will feel if the test comes back positive

(Peters et al., 2014).

Two key mechanisms have been proposed to explain overestimation in affective forecasting: focalism and adaptation neglect. Focalism refers to people's tendency to focus too much on salient features of a single emotion-eliciting event when they are predicting how they will feel. In doing so, they fail to consider that other, more mundane concerns and events will also occupy their attention in the future and mitigate the intensity of their emotional response (Wilson et al., 2000). Schkade & Kahneman (1998) demonstrated this phenomenon in a study of college students' perceptions of how happy they would be if they lived in California versus the Midwest. Both Californians and Midwesterners predicted that people living in California would be more satisfied with life, when in fact the two groups rated their life satisfaction similarly. The discrepancy was due to the excessive focus of both groups on climate and the outdoors when making their predictions. When these features were prominent, predictors paid less attention to other factors such as academic opportunities, job prospects, and financial circumstances, which were among the variables rated most important to life satisfaction by individuals who were actually living in California and the Midwest.

Adaptation neglect also contributes to overestimation in affective forecasting (Gilbert et al., 1998; Wilson & Gilbert, 2003). When predicting the emotional impact of future events, particularly negative events, people tend to overlook the psychological resources and coping strategies they will draw on in the face of adversity to help them adjust to the new circumstances. Gilbert et al. (1998) found that across a wide range of situations, from failing to get tenure to receiving negative feedback about one's personality, people consistently overestimated the duration of negative emotion in part because they failed to anticipate the strength of their "psychological immune system" to combat distressed feelings.

Focalism and adaptation neglect can lead to inaccurate forecasts about the emotional impact of health outcomes. When healthy people predict what their general level of happiness would be if they had a serious illness, they often focus too much on their feelings specifically about that illness and underestimate the countervailing influence of other aspects of life, such as family and work, on their overall well-being. Healthy people also consistently overestimate the negative impact that becoming disabled would have on their well-being, a robust finding known as the "disability paradox" (Ubel, Loewenstein, & Jepson, 2005). Even after taking into account that disabled patients may adjust their interpretation of well-being and using momentary assessments of mood instead of relying on global self-reports, the well-being of disabled and chronically ill people is generally higher than healthy individuals expect it to be. Similarly, when people undergo medical testing, for instance to determine whether they are carriers of genetic diseases, they tend to undergo a period of shock and distress after receiving a positive diagnosis, but later return to their baseline levels of well-being. Overestimating future distress can render patients risk averse and lead them to avoid diagnostics such as genetic testing and opt out of potentially beneficial treatments (Peters et al., 2014).

Overestimating future distress also makes it hard for people to predict their future preferences when making decisions about end-of-life medical treatment. For example, nursing home residents with varying levels of health and functioning were presented with health scenarios, such as being confined to bed or experiencing severe confusion (Winter, Moss, & Hoffman, 2009). The residents indicated their ideal number of future years of living with these conditions. Those who were currently in the best health indicated they would want to live significantly less time with these conditions than those in the worst health. Thus, healthier residents viewed declines in their health as more intolerable than did individuals who had

experienced some of these health problems themselves. Healthier residents did not anticipate the extent to which people adapt to declining health and maintain the will to live. More generally, studies examining people's desire for life-sustaining treatment have found considerable variation in their preferences over time, further calling into question people's ability to accurately anticipate their future feelings and preferences (Ditto et al., 2005).

Investigators have explored how to promote more accurate forecasts. Focusing narrowly on the most uncomfortable or stressful elements of a condition can lead people to fail to consider the many aspects of their lives that will remain unaffected by their condition. Consequently, one strategy for reducing focalism and improving forecasts asks people to consider the wide range of activities and situations they will be engaged in before predicting their future level of emotional well-being (e.g., Wilson et al., 2000). Interestingly, although this strategy has proved successful in other situations, defocusing exercises have been shown to be ineffective, and even to backfire, in forecasts about disability. Asking people to imagine how becoming paraplegic or undergoing amputation below the knee would impact various aspects of their life, including spiritual life, romantic relationships, and social ties, actually resulted in *lower* subsequent estimates of well-being (Ubel et al., 2005). Thus, defocusing may not be a promising way to help people think about chronic disability.

Interventions aimed at reducing adaptation neglect have proven more successful than those aimed at reducing focalism for promoting accurate forecasts of emotional responses to illness and disability. When participants reflected on a prior life event that had inspired great happiness or great sadness and then considered whether those feelings had become stronger or weaker over time, they predicted that their quality of life, if they were to become paraplegic, would be significantly higher (Ubel et al., 2005). These findings suggest that for improving

affective forecasts concerning health, interventions that enhance awareness of adaptation may be more fruitful than interventions that reduce focalism. Halpern & Arnold (2008) advised that when consulting with a patient who has just received a difficult diagnosis, physicians ought to first attend to the patient's emotional distress and then encourage the person to reflect on coping strategies they used to get through other challenges in life. Urging patients to allow a significant amount of time to pass between an initial consideration of healthcare options and making a final decision may also combat adaptation neglect.

In summary, events often elicit short-lived emotional responses that are followed by relatively quick adaptation. As people's goals and expectations change, and as other events capture their attention, they think about the focal event less often. But people often fail to take these changes into account when predicting their emotional responses. They expect to think about positive and negative outcomes more than they actually do (focalism) and fail to anticipate how quickly they will adapt to negative outcomes (adaptation neglect). As a result, they tend to overestimate the impact that events will have on their overall emotional well-being (e.g., Gilbert et al., 1998; Wilson & Gilbert, 2003; Wilson et al., 2000).

Underestimating the emotional impact of future events

Although people often overestimate the emotional impact of future events, the opposite bias has also been demonstrated. Research on "empathy gaps" shows that when people are in a "cold," affectively neutral state, it can be hard for them to anticipate the intensity of future "hot" emotional and physiological states. As a result, they underestimate the power of those future feelings to drive their thinking, preferences, and behaviors (e.g. Loewenstein, 2007; Van Boven, Loewenstein, & Dunning, 2005). People have been shown to underestimate the intensity of their future urges to eat, smoke, drink alcohol, gamble in Las Vegas, and engage in risky or unethical

sexual behavior (see Loewenstein, 2007 for review). For example, compared to men who were not aroused, men who were sexually aroused reported being more likely to be able to imagine having unprotected sex, being attracted to a 12 year-old girl, and slipping a woman a drug on a date (Ariely & Loewenstein, 2006).

People also underestimate the intensity of both emotional pain, such as embarrassment, and physical pain. Van Boven and colleagues (2005) found that people underestimated the influence embarrassment would have on their own and others' willingness to engage in public performances such as miming or dancing. Similarly, Read and Loewenstein (1999) evaluated participants' willingness to undergo a painful task in the laboratory (immersing a hand in ice water) for monetary payment. Participants who had immersed their hand in ice water a week prior asked for significantly less compensation than those who had immersed their hand just moments before. A group who had never done the task demanded the lowest payment of all. Although participants understood that the task was painful, those who had completed it a week ago, or had never completed it, had a hard time recalling or imagining the degree of pain, and consequently underestimated the intensity of future pain.

Even after recognizing forecasting errors, people do not permanently adjust their preferences. Christensen-Szalanski (1984) asked pregnant women about their preferences regarding the use of anesthesia during child birth at several time points: weeks before giving birth, while in labor, and afterwards. Weeks before going into labor and during the early stages of labor, many women expressed a preference for natural childbirth without anesthesia. However, as the labor continued and their discomfort increased, the women's preferences shifted towards desiring medication. The women had experienced an empathy gap between their idea of how natural childbirth would feel and how it felt in reality. Most striking, however, were the

women's evaluations one month after childbirth. By this point, their preferences had returned to their pre-labor position and they again favored childbirth without anesthesia, which suggests that they again underestimated the level of pain they had experienced during childbirth.

Interpersonal empathy gaps may arise between physician and patient when discussing treatment options. For instance, physicians in an affectively "cold" state may fail to appreciate the degree of pain a patient is experiencing and therefore under-prescribe pain medication. Empathy gaps may also help to explain the callous bedside manner of certain physicians, a source of complaint for many patients and their families. After many years of handling similar cases, physicians may have adapted to negative health outcomes and thus may have difficulty anticipating the emotional impact of the news they bear (Loewenstein, 2005).

Identifying people's forecasting strengths and weaknesses

Findings concerning the impact bias and empathy gaps reveal a clear tension in the research literature on affective forecasting. It is highly unlikely that people would show an impact bias, overestimating the emotional impact of future events, and simultaneously show an empathy gap, underestimating the impact of future emotion on their thinking, preferences, and behavior. For instance, if people predict that singing in public will be more embarrassing than it later turns out to be (impact bias), it is unlikely that they will underestimate their reluctance to sing (empathy gap). Moreover, people sometimes forecast emotion with striking accuracy (Levine, Lench, Kaplan, & Safer, 2012, 2013). To address these inconsistencies, researchers have examined the context in which an emotional experience occurs, the specific features of emotion people are asked to predict, and the procedures that researchers use to assess forecasting accuracy. This works sheds light on important moderators of the magnitude and direction of affective forecasting biases.

Lench et al. (2011) found that focalism can lead to either over- or underestimating the emotional impact of events depending on the context in which the event occurs. Students who were in a romantic relationship predicted how they would feel if they broke up with their partner. One group predicted how they would feel on February 7th and the other group predicted how they would feel on February 14th. Weeks later, those who had broken up with their partners reported their actual feelings on either February 7th or 14th. Students who rated their levels of distress on February 7th showed the expected impact bias – they had exaggerated how distressed they would feel. But students who rated their feelings on February 14 felt *worse* than they had anticipated, showing a reversal of the impact bias. When making their predictions, students underestimated how the connotations surrounding Valentine's Day would conspire to focus their attention on their lack of a relationship and intensify their negative emotions. Thus, the context in which an event occurs can determine the direction of bias in affective forecasting.

The magnitude and direction of forecasting bias also depends on the feature of emotion people are trying to predict: intensity versus duration or frequency. The impact bias is believed to characterize predictions about all of these features of emotion, and most forecasting studies do not distinguish between them (Wilson & Gilbert, 2003). However, in a series of studies and a meta-analysis of forecasting research, Levine et al. (2012, 2013) showed that although people overestimated when making judgments that encompassed the *duration* of future emotion (how happy they would feel in general), they were strikingly accurate when judging the *intensity* of future emotion (how happy would they will feel about a specific event). For example, people overestimated their reaction to the outcome of the 2008 U.S. presidential election when they were later asked to report how they were feeling in general without reference to the election. This bias was eliminated, and participants were far more accurate, when they were asked, "How

happy are you feeling about Barack Obama being elected President?" Indeed, they showed a slight but significant tendency to underestimate emotional intensity, revealing an empathy gap rather than impact bias. These findings suggest that mispredicting the duration or frequency of emotion, rather than its peak intensity, accounts for people's tendency to overestimate the emotional impact of events.

This distinction has important implications for decision making. Peak intensity provides an index of how good or how bad an experience will be, whether one has the resources to cope with it, and the amount of effort it is worth expending to achieve or avoid it (Fredrickson, 2000). Indeed, the intensity of emotion people expect to feel while an experience is occurring is often a primary determinant of whether they engage in an activity or avoid it (e.g., potentially painful medical procedures). Even when making life-altering decisions concerning career, marriage, and children, people consider the peak positive and negative feelings that different choices will bring about, as well as longer term effects on their emotional well-being. Thus, accuracy in predicting emotional intensity bodes well for decision making (Levine et. al., 2012, 2013).

Further research is needed, but three factors may contribute to greater accuracy in predictions of emotional intensity compared to duration or frequency. First, as emotional intensity increases, attention narrows to focus on central or salient features of events at the expense of more peripheral features (for a review, see Levine & Edelstein, 2009). People also tend to focus on an event's salient features when predicting the intensity of their feelings. Thus, the features of an emotion-eliciting event that are central at the time when people are attempting to predict their future emotional reaction to an event are also likely to be salient when they later experience the event, promoting accurate forecasts. Second, people may draw on their appraisals of an event's importance when attempting to predict the intensity of their emotional response.

Stability in people's appraisals of the importance of events for their goals would contribute to accuracy in predicting the intensity of emotion. Third, the peak intensity of past emotional episodes is remembered more accurately than their duration (e.g., Fredrickson & Kahneman, 1993), providing a better basis for prediction (Levine et al., 2012, 2013).

Finally, the degree of bias people display in forecasting emotion depends on how researchers conceptualize accuracy and on the procedures they use to assess accuracy. A meta-analysis of affective forecasting studies showed that although people are often inaccurate in their forecasts in an absolute sense, they are more accurate in a relative sense (Mathieu & Gosling, 2012). That is, people who predict they will feel the greatest emotion often end up feeling the greatest emotion, even if the absolute degree of emotion experienced ends up being less than expected.

Levine et al. (2012) found that procedures commonly used to assess forecasting accuracy can artificially increase the magnitude of the impact bias. In most forecasting studies, researchers ask participants to imagine that an event has occurred and rate how they will feel in general after a specified period of time. After that period of time has passed, researchers ask participants to report how they are feeling in general without reference to the focal event. Levine et al. found that in the context of having just been asked to imagine a specific future event, most participants interpret the request to predict how they will feel *in general* as asking how they will feel when they are later thinking about that specific event. When the intended meaning of the question was clarified, participants still overestimated the impact of events on their general emotional state but the magnitude of bias was dramatically reduced. Thus, future research on affective forecasting should assess people's ability to predict specific features of their emotional experiences and ensure that they clearly understand the features they have been asked to predict.

In conclusion, life is much harder when one cannot foresee what lies ahead, and people's inability to accurately predict the emotional consequences of their choices can lead to poor decisions and unhappiness. The research literature contains conflicting findings concerning the magnitude and direction of forecasting biases. However, taking a more nuanced approach to investigating people's ability to predict specific features of emotion helps to resolve these seemingly contradictory findings and sheds light on people's forecasting strengths and weaknesses. Recent findings suggest that people are fairly accurate at predicting the intensity of emotion they will experience in the future when emotion-eliciting events come to mind, and may even underestimate that intensity (Lench et al., 2011; Levine et al, 2012). But people tend to exaggerate how frequently they will think about emotional events and they neglect to consider the strategies they will use to cope with their emotions. As a result, they often overestimate the frequency and duration of their emotional responses (Wilson & Gilbert, 2003, 2005). Given that people predict some features of emotion more accurately than others, further research is needed to identify which features people spontaneously forecast in order to make decisions in their daily lives. Understanding sources of accuracy and bias in affective forecasting can help healthcare professionals guide people as they confront decisions concerning predictive genetic testing, end of life medical provisions, treatments for addiction, and other health related issues.

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Linda J. Levine is Professor of Psychology and Social Behavior at the University of California, Irvine. She received an M.Ed. from Harvard University and Ph.D. from the University of Chicago, both in psychology. Her research focuses on the cognitive and motivational processes that evoke emotions; how emotions influence the features of events

people attend to, find important, and later remember; biases in predicting and remembering emotions; and the development of children's ability to regulate emotions.