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Barry Schwartz

Swarthmore College, bschwar1@swarthmore.edu

R. Sommers

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Affective Forecasting and Well-Being

Barry Schwartz and Roseanna Sommers

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Abstract and Keywords

Every decision requires a prediction, both about what will happen and about how the decider will about what happens. Thus, decisions require what is known as . This chapter reviews evidence that people systematically mispredict the way experiences will feel. First, predictions about the future are often based on memories of the past, but memories of the past are often inaccurate. Second, people predict that the affective quality of experiences will last, thereby neglecting the widespread phenomenon of adaptation. Third, in anticipating an experience, people focus on aspects of their lives that will be changed by the experience and ignore aspects of their lives that will be unaffected. Fourth, decisions are profoundly affected by the choice context, even though the choice context will no longer be relevant when the chosen object is actually experienced. Each of these affective forecasting “errors” can lead people to mispredict satisfaction with decisions.

Keywords: affective forecasting, decision making, subjective experience, misprediction, rational choice

Every decision requires a prediction. The world is an uncertain place, and what may happen is rarely guaranteed to happen. Should you expand your business? Invest in stocks or in bonds? Refinance your home? Carry a new line of products?

As challenging as decisions like these are, there is one respect in which they are simple: Your aim in each of these cases is to maximize return on investment. Return on investment is the consequence that matters. It is an objective outcome that is being pursued, one that can be measured unambiguously. Contrast that with decisions like these: Should you switch jobs? Move to a new neighborhood? Go on vacation to Europe or Mexico? Eat at the Italian restaurant or the Japanese one? These decisions also involve predictions, and no doubt, they, too, have objective, unambiguously measureable characteristics. But now, what you are mainly trying to predict is your subjective experience. How much satisfaction will you get from the new job? How much will you like living in the new neighborhood (and how big a pain will it be to move)?

There are certainly subjective aspects of your business decisions that matter. How will it feel, for example, to achieve a targeted rate of return, only to discover that a competitor achieved a slightly higher one? And there are certainly objective aspects of decisions about jobs, restaurants, and vacations that matter. So virtually all decisions, in all domains, have both objective and subjective dimensions. But the questions at the heart of most business or other financial decisions concern predicting a future state of the world, whereas the questions at the heart of most of personal decisions concern future states of you. Personal decisions like these ask not “What will happen if I do X?” but rather “How will I feel if I do X?” So, in addition to predicting objective events, you must also predict your subjective response to those events.

This chapter is about people’s ability to predict subjective experience, what is sometimes referred to as “affective forecasting” (e.g., Gilbert, 2006; Gilbert & Wilson, 2000, 2007). More precisely, it is about the ways in which people make frequent and systematic errors when endeavoring to predict how they will feel. These errors in prediction can lead to frequent and systematic mistakes in decision making—mistakes in the sense that the decisions people make often do not provide them with the subjective experiences they expect.

The potential significance of these errors cannot be overstated. The aim of rational decision making, economists tell us, is to maximize utility—not wealth, but utility. Though it is hard to pin down exactly what “utility” means, it certainly has a subjective element that cannot be eliminated. Part of deciding what job to take, where to live, where to go on vacation, or pretty much anything else, is predicting how your choice will make you feel. Even if you could predict the objective future perfectly, failure to predict the subjective future would consistently leave you feeling that you made a mistake. So how well do people predict their subjective futures?

Forecasting Based on Inaccurate Memory

Imagine yourself a college student about to go off to South Florida for spring break. Some psychologists have outfitted you with a personal digital assistant (PDA) that will beep periodically while you are away. When it beeps, your job is to respond to a series of questions designed to assess how you are feeling at that moment. This technique is known as “ecological momentary assessment” (EMA; Kahneman, 1999) or “experience sampling.” We might regard the integral, or algebraic sum, of these moment-by-moment affective responses as an objective measure of how happy the students were to be on vacation (Kahneman, 1999, 2000; Kahneman & Thaler, 2006). It is a measure of “experienced utility,” or how life is going as it is being lived. Experienced utility is quite different from “remembered utility,” which is what you rely on to answer your coworker’s query about how your vacation was. To answer her, you survey your memory and form a summary judgment of the entire vacation.

Wirtz, Kruger, Scollon, and Diener (2003) gave PDAs to college students and measured their moment-by-moment affective experience while they were on vacation for spring break. They found that the students misremembered how much fun they had had. Whereas they remembered their vacations as having both intensely positive and intensely negative points, their moment-by-moment reports recorded on their PDAs revealed that they had had a much more mild time. This disparity raised a key question: If students' in-the-moment ratings of spring break differed from their after-the-fact, memory-based ratings of spring break, which opinion would form the basis of their future decisions? What Wirtz et al. found was that it was the memory of the experience, not the experience itself, that most influenced people's willingness to have the experience again (i.e., to go back to South Florida next year during spring break). Thus, it appears that when experienced utility and remembered utility disagree, it is remembered utility that most influences affective forecasting.

Perhaps this is not so surprising. When making decisions, we draw on our experience with past events to decide how much we will enjoy similar future events (e.g., "How much did I enjoy being in Mexico last spring?"). But we cannot truly relive our old experiences to know how much we enjoyed them; all we have access to is our memories of those experiences. Thus, every prediction requires relying upon memory, and memory is not a veridical representation of moment-by-moment experience.

If our memories were perfectly veridical, then when trying to answer a question such as "How was your break?" people would create a summary judgment by giving each moment of the experience equal weight. But Kahneman (1999, 2000) discovered that memory is *systematically* nonveridical. What Kahneman found is that two moments of an experience have an outsized effect on our memory-based summary judgments: the "peak" and the "end." That is, what seems to be stored in memory is what the experience was like at its most intense point (the peak) and how it ended. Kahneman found that the global, summary evaluation of an experience (i.e., what people rely on to answer "How was your break?") is not very close to people's time-integrated moment-by-moment experiences. Rather, summary evaluations seem to match up with the mathematical average of the peak moment and the end moment.

One of the most important implications of the "peak-end rule" is that the duration of the experience seems not to matter, a phenomenon that has come to be known as "duration neglect." Two weeks on the beach in Florida, *as lived*, will certainly be different from 1 week on the beach. But if the two experiences have similar peaks and similar endings, they will be remembered as affectively equivalent. Indeed, Redelmeier, Katz, and Kahneman (2003) studied patients who underwent painful colonoscopy procedures that ranged in duration from 4 (p. 706) minutes to 69 minutes and found that, surprisingly, duration did not affect patients' retrospective evaluations of the experience. Only the pain felt at the peak and at the end affected patients' memories of the procedure and their likelihood of returning for a repeat procedure years later. Duration mattered so little that some pa-

tients even preferred the longer, more painful colonoscopy procedures—as long as those elongated procedures ended on a less painful note.

There is now substantial evidence in support of this peak-end rule for encoding and recalling affect. For example, Kahneman, Fredrickson, Schreiber, and Redelmeier (1993) asked participants to immerse their hands in freezing cold water twice: once in 14°C water for 60 seconds and once in 14°C water for 60 seconds with an additional 30 seconds tacked on at the end, during which the water temperature was gradually raised to 15°C (still painful, but less so). Even though the 90-second trial exposed participants to all the pain of the 60-second trial and more, participants tended to remember the 90-second trial as less painful. When given the choice of which trial they would prefer to repeat for a third dunking, most participants chose the longer trial. Similar results have been found with other unpleasant experiences (e.g., exposing people to loud noises followed by less loud noises) as well as pleasant experiences.

The fact that there are discrepancies between experienced affect and remembered affect raises an important question: Which is more important? If a longer colonoscopy causes you more pain, but you remember it as causing you less, is it worth the extra few minutes of pain to secure a better memory? It might be, especially considering that a better memory might make you more willing to return for future colonoscopies to screen for colorectal cancer. Furthermore, if you remember spring break in South Florida as a fantastic vacation, but your PDA reports reveal that it was rather mundane, are you better off staying home next year? It seems that if you decide to go back for your next spring break, and you have a mediocre time again, but you remember it as a wonderful trip, perhaps the forecasting “error” is not much of an error after all.

The experience of spring break, or ice water dunking, or anything else is just a moment in time. The memory of that experience may last forever. And people do not simply file away the memories of experiences; they “consume” those memories in the future. So there is a sense in which “spring break” is actually “spring break plus all the times I think about it and talk about it later on.” Thus, remembered affect is important beyond its function as the basis for future decisions; it is important because you will consume those memories over and over for the rest of your life.

There are a number of issues regarding the peak-end rule and its role in the encoding and recall of affective experience that remain to be resolved. First, what counts as an “episode” over which affective experience is integrated and summarized? Is spring break one episode or many? Does it have one peak and one end, or several? It remains to be seen whether global judgments are better predicted by the peak/end of each episode or the peak/end of the whole unified experience. Second, how are the positive and negative moments that characterize most real-life experiences combined and integrated? Are there separate positive and negative peaks? Does one get subtracted from the other? Does whichever peak is greater determine whether the experience is summarized as positive or negative? All of these questions require more investigation.

Beyond our tendency to remember peaks and ends, there are other instances of non-veridical memory. There is considerable evidence that people's memories often align with their expectations, even if their actual experiences (as measured by ecological momentary assessments) tell another story. In the 2000 presidential contest between Al Gore and George W. Bush, devoted Republicans and Democrats each made predictions about how they would feel the day after the outcome of the election was decided. Republicans thought they would be elated if Bush won and Democrats thought they would be devastated. But when researchers followed up with them shortly after Bush was certified as the winner, it became evident that both groups had overestimated their affective responses: Bush supporters were happy but not ecstatic, whereas Gore supporters were disappointed but not distraught. Interestingly, when researchers contacted participants 6 months later and asked them to recall how they had felt the day after the election's outcome had been decided, Republicans remembered feeling elated and Democrats remembered feeling devastated. Their recollections matched their expectations, not their actual feelings (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). Wirtz et al. (2003) found a similar result with the college students on vacation: They remembered spring break being about as much fun as they had expected it to be.

In addition, when asked to recall how they felt after events of a sort they have experienced many (p. 707) times in the past, people tend to recall not a typical instance, but an extreme one. Furthermore, they treat the extreme instance as if it were typical. For example, when students are asked to recall a time when their school's team won a football game, they come up with the most extreme example (e.g., "We had a miraculous last-second comeback and it was unbelievably exciting"; Morewedge, Gilbert, & Wilson, 2005). The fact that the most unusual, affectively intense examples are the ones that come most easily to mind means that forecasts are often based on the most extreme past experiences, causing people to overpredict their emotional reactions (e.g., "I will be ecstatic if my team wins this time"). Morewedge et al. found that people who explicitly corrected for this bias in memory retrieval, either by recounting multiple past experiences to achieve a more representative sample on which to base forecasts or by recognizing that the salient example was actually an outlier, were able to forecast more accurately how exciting they would find the game they were about to watch. But in the absence of retrieval aids like these, the bias in memory retrieval toward affectively intense experiences is another cause of inaccurate forecasts.

Overestimating Affective Responses to Events: Durability Bias and Focalism

Drawing upon nonveridical memories is one reason people mispredict what will make them happy, but memory is hardly the only source of affective forecasting errors. Another important source of misprediction is a failure to appreciate that by and large, people adapt to new circumstances. They get over bad things and stop enjoying good things (e.g., Brickman, Coates, & Janoff-Bulman, 1978; Fredrick & Loewenstein, 1999; Gilbert,

2006; Lyubomirsky, 2007). Sensory adaptation and neural adaptation are long-known, pervasive features of the organism's response to its environment. Stimuli of constant intensity produce ever-diminishing responses over time, a process known as habituation. The same seems to be true of affective experience. The classic demonstration of what is often called "hedonic adaptation" was provided by Brickman, Coates, and Janoff-Bulman (1978), who compared the subjective states of people who had recently become paralyzed and people who had won significant sums of money in state lotteries. They found that whereas the self-reported life satisfaction ratings of paraplegics and lottery winners were vastly different shortly after the momentous events, as time passed, people's subjective states tended to gravitate back to their original happiness levels. Furthermore, looking at their projections of how happy they expected to be in the future, it was impossible to tell who had had a tragic accident and who had hit the jackpot. Thus, seemingly life-altering experiences can have merely transient effects on subjective well-being.

People do not adapt to all hedonic experience (see Frederick & Loewenstein, 1999). It may take years to adapt to major life events like divorce, death of a spouse, or job loss, and adaptation may never be complete (Lucas, 2005, 2007; Lucas & Clark, 2006; Lucas, Clark, Geirgellis, & Diener, E., 2004; see Diener & Biswas-Diener, 2008, for a review). Nonetheless, as a general rule, hedonic adaptation reduces the affective impact of experiences over time. This fact has been codified into some theories of well-being. For example, Lyubomirsky (2007) suggests that people have a "set point" for happiness, which may account for as much as 50% reported well-being. This happiness set point acts as a kind of gravitational pull. Good experiences deflect people up from their set points and bad experiences push them down, but over time, gravity does its work and they return, at least partially, to where they started.

If hedonic adaptation is a fact of people's affective lives, the question is, do people expect it and thus predict it? People might not spend months deciding what make and model of new car to buy if they know that they will only get a hedonic "kick" out of the car for a few weeks, after which it will become just their mode of transportation. Gilbert and Wilson (e.g., 2000, 2007; see Gilbert, 2006; Gilbert et al., 1998) provide extensive empirical evidence that people fail to anticipate adaptation. People display what Gilbert and Wilson call "durability bias" in expecting the affective quality of experiences to last. Gilbert and Wilson demonstrate this bias by asking people to predict how it will feel, days, months, and even years after the fact, to get tenure or be denied tenure, to have their favored gubernatorial candidate win or lose an election, or to have their favored team win or lose the big game. They find that people's predictions are largely unaffected by the time interval between the event and the moment of evaluation. This is in marked contrast to queries of other people, days, months, or years after they have actually gotten or been denied tenure, seen their candidates win or lose election, or their favored team win or lose the game. For the "experiencers" of these events, time seems to heal all wounds (or blunt all triumphs). The mismatch between prediction of the future and the actual (p. 708) experience of that future is a powerful example of an error in affective forecasting (Gilbert et al., 1998).

In a detailed, careful investigation of adaptation, Riis, Loewenstein, Baron, Jepson, Fagerlin, and Ubel (2005) combined the “predictor/experiencer” techniques of Gilbert et al. (1998) with the experience sampling techniques of Wirtz et al. (2003) and Kahneman (1999, 2000) in a study of patients with end-stage renal disease, a chronic medical condition. To an outsider, life as an end-stage renal patient looks pretty miserable, as multiple times per week, patients are required to spend several hours hooked up to a machine in a hospital or clinic that performs the blood-cleaning and filtering, a process known as “hemodialysis.”

Riis et al. found healthy people to act as a control group, matching each hemodialysis patient with a healthy person who had similar demographic characteristics. The researchers sought to examine how healthy and sick people would imagine being in one another’s shoes. Hemodialysis patients were asked to imagine they had never been sick, and healthy people were asked to imagine they had been on hemodialysis for as long as their matched partner had been. The participants estimated what their mood levels would be like if they were in their matched partner’s shoes. Riis et al. found that healthy people vastly underestimated the mood levels of hemodialysis patients; they thought chronic kidney disease would cause overall negative mood, whereas in actuality, hemodialysis patients’ mood levels were positive overall. Furthermore, the PDA data revealed no differences in mood between the hemodialysis patients and the healthy controls. In other words, the dialysis patients adapted, and the healthy controls did not anticipate this adaptation.

Did the dialysis patients appreciate that they had adapted? Riis et al. reasoned that if a patient were aware of adaptation, then when asked how happy she would be if she had never had kidney problems, her estimate would be about the same as the happiness she currently reported (which the PDA data revealed was about the same as the happiness that healthy controls reported): “Dialysis is bad, but I’ve adapted, so there’s no reason to think that if I weren’t on dialysis, I’d be any happier.” What the researchers found, however, was that dialysis patients substantially overestimated how happy they would be if they had never been sick. These data suggest that hedonic adaptation is a process of which people are largely unaware.

People not only overestimate the duration of their affective responses to events; they also overestimate how intense those feelings will be. This may be due to what Gilbert and Wilson call “focalism,” or the “focusing illusion.” When imagining an alternate state of reality, such as what it would be like to become paralyzed, people focus on the aspects of their lives that will be affected by that event, and ignore aspects of their lives that will be unaffected. Mobility expands to fill the entire screen, and people forget that that while becoming paraplegic will affect a person’s ability to get around, it might not change the quality of that person’s social relationships, or the satisfaction that can be derived from work. Many facets of life will be the same, wheelchair or not, but when imagining the momentous event, all a person can think about is how his or her life will change. In addition, people learn to adjust to the momentous event in ways that they could not have anticipated. They may even be able to find benefits—silver linings—in unfortunate events (e.g., “The

accident may have paralyzed me, but it made me appreciate how precious every moment of being alive is”).

To summarize this section, people experience hedonic adaptation, yet they fail to predict it. They also exhibit a focusing illusion, whereby they neglect to take into account all the ways their lives will be unaffected by the change in question. Thus, predictions of affect tend to be more intense and longer lasting than reality warrants due to both focalism and the underestimation of adaptation.

But people do not adapt to everything, and even when they do adapt, the pace of adaptation can vary dramatically from one affectively relevant experience to another. We do not yet fully know why people adapt easily to some experiences and not to others. Indeed, there may be no especially perspicuous classification. Possibly, the more important to one's life an experience is, the less one will adapt. Possibly, the more aspects of a person's life an experience affects, the less the person will adapt. Possibly, the adaptation process is dynamic, such that with repeated experiences of a certain type, adaptation occurs more and more rapidly. Though it is important that people be cognizant of hedonic adaptation so that they can predict future affect more accurately and thus be able to make better decisions, it is also apparent that affective adaptation is a mixed bag that we still do not fully understand.

Preferences Shift Depending on the Context

Another reason it is difficult to make decisions that make us happy is that our preferences are not stable. They are affected by seemingly irrelevant (p. 709) aspects of the decision context, such as what other options are presented and how those options are described. Our preferences are also affected by our state of arousal. If we fail to understand that our preferences change, we can exhibit a “presentism bias” (Gilbert, 2006): We choose what we want now instead of thinking about what we will want later.

Much of the time, perhaps most of the time, the decisions people make involve not just predicting how some object or event will make them feel, but how that object or event will make them feel in comparison with other objects and events. That is, most of the time, decisions require choices among alternatives. The choice one makes reflects a prediction that the chosen option will make for more satisfaction than the alternatives. Though there is probably seldom an explicit prediction of affect (i.e., people rarely ask themselves, “How will I feel if I have the chicken, as opposed to the beef?”), in effect, making a choice among options amounts to a prediction of affect.

In theory, choice among alternatives should be fairly simple. The rational choice model of economists assumes that people have well-ordered preferences, so that choosing is just a matter of “looking up” those preferences, or of determining which of those preferences each option will allow you to satisfy, and then going with the highest ranked one. Economists further assume that the relation between preferences and behavior is straightfor-

ward, so that even when people have not stated their preferences, or “looked them up,” we can tell what people like by observing what they choose.

Forty years of research on decision making makes it abundantly clear that this rational choice model provides an extremely inaccurate description of how people actually choose. It is not so much that people go against their preferences when choosing (though this is sometimes the case). It is that people may not even *have* preferences until a choice presents itself. Even more problematic, people may have partial and somewhat incoherent preferences, which then get filled out by the set of options they confront. As both Fischhoff (1991) and Slovic (1991) put it, often, preferences are *constructed* rather than consulted, and that construction is heavily influenced by the context in which choices are made.

For example, Brenner, Rottenstreich, and Sood (1999) asked San Francisco Bay Area students to make choices about various travel options. One group was asked, “You are thinking of taking a long weekend out of town. You are considering Seattle, Las Vegas, and Los Angeles. How much would you pay for a roundtrip plane ticket to Seattle?” These respondents were willing to pay an average of \$135. The researchers then asked a second group of students, “You are thinking of taking a long weekend out of town. You are considering Seattle. How much would you pay for a roundtrip plane ticket to Seattle?” Students responding to this question were willing to pay \$206 for a roundtrip ticket to Seattle, a 50% increase over the other group.

So which is it? Which number reflects the “true” value of a trip to Seattle? This is a question with broad implications, since the mode of inquiry used in this study, known as “contingent valuation,” has come to be viewed as the gold standard for assessing the welfare consequences of various public policies. Why does Seattle seem so much less attractive when it is considered alongside Las Vegas and Los Angeles? Brenner et al. suggest that when there are multiple options, people are forced to compare the benefits and drawbacks of each locale. In making such tradeoffs, losses loom larger than gains (see, e.g., Kahneman & Tversky, 1984; Kahneman, 2003 for a discussion of “Prospect Theory,” which systematizes this sensitivity to losses). Thus, people are bothered more by what they will lose in passing up Los Angeles and Las Vegas than they are pleased by what they will gain in choosing Seattle. As Brenner et al. argue, everything suffers from comparison.

Interestingly, the presence of Las Vegas and Los Angeles as alternatives only serves to make tradeoffs more easily noticeable; the tradeoffs exist regardless of whether people realize that a choice for Seattle is a choice against going anywhere else. The people who were asked only about Seattle were making tradeoffs as well (i.e., by going to Seattle they were precluding themselves from going to Las Vegas, Los Angeles, and everywhere else they might go), but for these respondents, the foregone alternatives were not as noticeable. It appears that people do not spontaneously generate alternatives. Comparison is not automatic.

Thus, it can be said that how much one likes Seattle depends on how many options are presented. Preferences are shaped by the choice context. Christopher Hsee has done pioneering research on other misleading cues that people use to construct their preferences (e.g., Hsee, 1996; Hsee & Hastie, 2006; Hsee, Hastie, & Chen, 2008; Hsee & Zhang, 2004).

Consider going to choose a new set of speakers for your home theater. In the consumer electronics store, you listen to dozens of possibilities. Some candidates are clearly different, but many seem (p. 710) agonizingly close in sound quality. Nonetheless, when you listen to them side by side, you can detect subtle differences.

You narrow the finalists down to two. One set of speakers sounds better than the other, but it is unattractive and will clash with your décor. The other, slightly less pleasing sounding speakers will fit into your living room perfectly. Faced with this tradeoff, which speakers will you choose? There is no right answer to this question, but as Hsee shows, there may be a substantial difference between what matters in the store and what matters at home. In choosing the speakers, you are performing what Hsee calls a “joint evaluation.” That is, you are making a direct, side-by-side comparison between alternatives. Under these conditions, small differences in sound quality will be detectable, and probably quite salient (sound is what speakers are for, after all). Given the detectable difference, you might be tempted to choose the speakers that sound better.

But then, you bring them home, and set them up. Whereas you used joint evaluation in the store, at home you have separate consumption. The differences in sound that seemed significant in the store vanish, because you did not realize—could not realize—that it was only the direct comparison that made them noticeable. Meanwhile, the unattractiveness of your chosen speakers needs no direct comparison. It is obvious, a direct reproach to you for neglecting the difference the choice context makes.

For Hsee, this problem is endemic to the processes of rational choice. Wise choosers are supposed to comparison shop, which means using joint evaluations. But consumption is always separate from the foregone options. As a result, people will consistently overestimate the subjective magnitude and importance of some differences. People will consistently mispredict the satisfaction they will derive from their choice as a result of failing to appreciate that what is best in a side-by-side comparison may not be what is best alone.

A related finding was reported by Dunn, Wilson, and Gilbert (2003) in a study of first-year students at the University of Virginia who participated in the annual housing lottery that determined dorm room assignments for the next 3 years. Students entered the lottery in groups of their own choosing, meaning that no matter where they ended up, they would be with their closest friends. Thus, housing options differed from one another not in terms of social environment but in terms of location, and therefore convenience. Prior to the lottery, students believed that the outcome of the lottery would have a big impact on the happiness they experienced in the coming years. They were wrong: Housing had virtually no impact on self-reported happiness (determined by follow-up inquiries 12 and 24 months later). The only factor that significantly influenced happiness levels was the social

climate at the various houses, and because the houses differed little from one another in this regard, happiness levels were relatively constant. The students had focused, incorrectly, on location.

Why did they make this mistake? It was not because they were unaware that it would be social environment that would actually matter most for happiness. When asked to rate the significance of various aspects of residential life, students showed that they understood that the social dimensions of where they lived were key. Yet they abandoned this understanding when it came to predicting their satisfaction with the various housing options. These students faced a situation not unlike the customer shopping for speakers. In the important respects, the housing options are essentially equivalent—no matter where they end up, their friends will be with them, so that social environment and sense of community were constant across alternatives. So students looked for a way to differentiate the housing options. They focused on the dimension—location—on which options differ, even though it was relatively unimportant. They then elevated the significance of this difference, forgetting that when it came to their overall happiness, any differences in location would be overwhelmed by the impact of their social environments.

In these examples we see that aspects of context at the moment of decision affect the evaluation of options, and thus affect the decision. Dunn et al.'s (2003) housing study provides another example of how affective forecasts may be inaccurate if people focus too much on what is the best among the options, and not enough on what will be best when it is experienced by itself. Thus, people who are influenced by joint evaluation to choose an option on the basis of features that will not matter when they are actually consuming it are making an affective forecasting error, even if it is only implicit.

Hot-Cold Empathy Gaps: Mispredicting the Effect of Arousal on Decisions

Preferences are unstable in another way: They often fluctuate due to changes in arousal. For example, when you ask people whether they would have sex without a condom, almost everyone says (p. 711) no. Yet lots of people do. When you ask people whether they would drive when impaired by alcohol, almost everyone says no. Yet lots of people do. This mismatch between what people say they will do when in a given state (e.g., when they are sexually aroused) and what they actually do is an error in affective forecasting. But it is different from the ones we have considered thus far. Now, the forecasting error is not about how people will *feel* in the future; it is about how the way they feel will affect what they *do*. It is what Loewenstein (1996) calls the “hot-cold empathy gap.”

Loewenstein argues that people in cold states have little empathy for themselves in hot states and, conversely, in hot states people do not anticipate feeling cold. People in cold states find their hot state behavior perplexing (e.g., “How could I have been so tired that I fell asleep in class?”). It is easy to imagine resisting temptation when one is not tempted (e.g., “I don’t need coffee before my afternoon class because there is no way I’ll be tired

enough to doze off"). As a result, people fail to take the kinds of precautions that will prevent them from succumbing to temptation in the future. They rely too heavily on willpower, because when unaroused, they do not appreciate how powerfully arousal will alter their preferences. When unaroused, precautions seem unnecessary.

Perhaps the first demonstration of this hot-cold effect was reported by Nisbett and Kanouse (1968), who showed that people who did their supermarket shopping when hungry bought more food than they needed or wanted later, when they were no longer hungry. They predicted their future feelings inaccurately. Another example of the hot-cold empathy gap is the failure of pregnant women—even women who have given birth before—to anticipate that they will want pain medication during childbirth (Loewenstein, 1996).

More recently, Ariely and Loewenstein (2006) showed that men who answered questions about the desirability of various sexual partners and practices while sexually aroused were considerably more willing to engage in risky sex and unorthodox sex than they were when unaroused. This finding demonstrates that preferences differ when people are in a hot state versus cold state. The forecasting error comes from the fact that people do not appreciate these hot/cold differences.

Loewenstein's (1996) account of this phenomenon suggests that when people are in a hot state, their attentional focus narrows, the value of objects or events relevant to that state is enhanced, and people's willingness to delay gratification (what is often referred to as their "temporal discount function") plummets. He further suggests that people underestimate the effects of being in hot states and do not remember how powerful past hot states were. As a result, the mistakes people make when aroused are likely to be repeated.

In discussing this phenomenon, Gilbert (2006) suggests that one reason why people fail to allow for the effects of hot states is that no matter how much they try to avoid it, people's predictions regarding future affective states will be anchored, in part, by their current affective (and neural) states. People anchored in how they feel at the moment can try to correct for this starting point, but correction is often insufficient, and thus people exhibit a "presentism bias." As a result, current affective states will always exert an influence on predictions about future states.

Presentism has been demonstrated in another study that is perhaps less dramatic than those involving sexual arousal or intoxication, but no less compelling. Read and Loewenstein (1995) asked undergraduates what snacks they would like to eat during a weekly seminar. Some students selected their snacks every week for 3 weeks, whereas other students were asked on the first week to choose the snacks they would eat over the next 3 weeks. Those who chose every week tended to pick the same snack (their favorite) every time. But those who were asked to choose for 3 weeks at once tended to select more variety: tortilla chips this week, Oreos the next week, and Snickers bars the week after that. They seemed to assume that they would grow bored with the same snack week after week. When it came time to consume their choices, however, those who had chosen ahead of time often wished they could have their favorite snack again. They wanted less variety than they had committed themselves to, a tendency that has come to be called "di-

versification bias” (Read & Loewenstein, 1995; Simonson, 1990). It is as though at the moment of choice, people imagine eating a bag of tortilla chips, then another, and then another, and surmise that they will get tired of eating tortilla chips. What they cannot do is imagine what it will be like to be offered a bag of tortilla chips a week after having consumed the last one. This is a presentism bias because they are anchored on how they feel now (i.e., three bags of tortilla chips is too much) and do not realize that with a week in between each bag, their appetite for tortilla chips is quite different.

(p. 712) In a somewhat related phenomenon, when people are asked to choose several films to rent, all at the same time, they select something lowbrow and entertaining for now (e.g., *Animal House*) and something respectably edifying for later (e.g., *The Sorrow and the Pity*). But when “later” comes, what people turn out to want is another film in the lowbrow category (Milkman, Rogers, & Bazerman, 2009). Similarly, people ordering groceries online are more likely to order junk food (e.g., ice cream) for now and healthy food (e.g., vegetables) for a few days later (Milkman, Rogers, & Bazerman, 2010; see also Milkman, Rogers, & Bazerman, 2008). As Milkman, Rogers, and Bazerman (2008) put it, people often face a choice between “wants” and “shoulds.” They tend to want their “wants” satisfied now and their “shoulds” deferred for later. But when later becomes now, the “shoulds” that seemed attractive enough in the temporal distance lose their attractiveness. Read and Loewenstein (1995) surmised that something similar may have been going on in the snacks study: People who were planning out their snacks for the next 3 weeks had the goal of diversifying their food choices, but when it came time to eat the food, the goal of variety was no longer operative. All they wanted was what would taste the best—their favorite snack.

What all of these studies show is that people have time-inconsistent preferences. To the extent that people know what they want when their passions are cooled and the objects or events are at some temporal distance, it often makes sense for them to bind themselves to these preferences, because they may not still have them at the actual moment of choice. It is not always the case that the cool self knows best (e.g., in the throes of intensely painful labor, it may make sense to abandon your cold-state preferences for a “natural childbirth” and do something to relieve the pain). But regardless of whether your judgment is better in hot or cold states, failing to recognize the extent to which arousal can alter preferences can produce sizable forecasting errors. Though these phenomena are less about predicting how one will feel about a choice in the future, and more about predicting how the way one feels will affect what one chooses in the future, they are nonetheless evidence for the importance of affective forecasting and for people’s failure to do that forecasting accurately.

How “Deep” Are Affective Forecasting Errors?

We have reviewed a variety of respects in which people’s predictions of future affect are inaccurate. We can ask, with regard to each, exactly what the nature of the inaccuracy is. One possibility is that people are aware of such factors as memory distortion, context ef-

fects, and adaptation, but that they are badly calibrated. That is, they allow for these inaccuracies, but they do not allow sufficiently for them. If so, correcting mispredictions would involve recalibrating a system that is already attuned to relevant factors. By analogy, one could imagine someone who appreciates that the perceived size of familiar objects is a reliable cue to how far away they are, and thus uses perceived size as a cue to distance, but who nonetheless systematically underestimates distance. If this were the source of inaccuracy, adjustment would probably be fairly simple. In contrast, it is possible that people are simply unaware of any of these sources of misprediction. They cannot adjust, because they do not know what needs to be adjusted. This second possible source of misprediction would be much deeper, and much harder to correct, than a mere problem of calibration. Though there has been little systematic attention devoted to this issue, what evidence there is suggests that miscalibration is not the problem—that people mispredict affect because they simply do not appreciate context effects, adaptation, and memory distortion and other sources of misprediction at all (see Nisbett & Wilson, 1977; Wilson, 2002; and Wilson, Centerbar, & Brekke, 2002, for discussion).

How Leaky Rationality May Make Forecasts Accurate

The foregoing discussion creates a picture of decision making that makes one wonder how people ever make good decisions. If decisions are aimed at maximizing utility, and utility includes affect, and people mispredict affect, how can they ever get it right? Though there is little doubt that people often do not get it right, there is another perspective on affective forecasting that suggests a mechanism by which forecasting “errors” get “corrected.” Keys and Schwartz (2007) wrote a paper in which they introduced a concept they called “leaky rationality.” What they meant by the term is that factors that influence a decision may continue to exert their effects after the decision is made. That is, considerations at the moment of decision “leak” into the experience of the decision.

For instance, if people choose burgers that are “75% lean” over burgers that are “25% fat” (obviously the same burgers), they will think the “lean” burgers taste better than the fat ones. It seems irrational for decisions to be influenced by the way in (p. 713) which options are described (“fat” vs. “lean”). But as long as these factors that influence a decision also influence one’s experience with the results of that decision, there is nothing irrational about it—at least as long as the aim of decisions is maximizing utility, a subjective entity, rather than some objective outcome.

Consider the following study by Lee, Frederick, and Ariely (2006). Patrons at a bar in Cambridge, Massachusetts, were subjected to a taste test between a popular commercial beer and “M.I.T. Brew,” another commercial beer that had been adulterated with a few drops of balsamic vinegar. When participants were unaware of the composition of the M.I.T. Brew, they preferred it to the commercial beer. When they were told in advance that the M.I.T. Brew contained balsamic vinegar, they preferred the commercial beer. But when they were told about the adulteration of M.I.T. brew only *after* they had tasted it,

they preferred it to the standard beer. In their account of this finding, Lee, Frederick, and Ariely argue that people's understanding before the experience (the taste) continues to exert its influence during the experience. So when people do not find out until after the fact that M.I.T. Brew has vinegar, they think something like, "What a surprise. Who would have thought that vinegar enhances the taste of beer?" When they find out before the fact, they think something like "Ugh. Beer with vinegar. This will be awful." In other words, conditions of understanding under which people have an experience shape the subjective quality of the experience. The knowledge of M.I.T. Brew's special ingredient actually alters the sensory experience of tasting the beer.

What this means is that, at least some of the time, the context of choice, with all of the misprediction of affect it may contain, will exert enough of an influence on the experience that the "misprediction" turns out not to be so wrong after all. In the study described earlier in which students assigned a price to a trip to Seattle, it seems apparent that it is a mistake to value the trip to Seattle less when it is bracketed with trips to Las Vegas and to Los Angeles. But we suggest that if you spend your time in Seattle thinking about all you have passed up by not going to Las Vegas or Los Angeles, you will not enjoy Seattle nearly as much (see Schwartz, 2004). The context of the decision may leak, affecting the consumption of the experience. The so-called faulty forecast exerts an effect on the experience such that it is not an error.

What the concept of "leaky rationality" means is that at least some of the time, apparent errors of affective forecasting will not be errors. The currently unanswered question is: When do decisions leak? For the students in Dunn's study, for example, the expectation that housing location would affect happiness did not appear to leak into the experience of living in the dorms. Students who got desirable dorm rooms were not more satisfied than those who got undesirable ones. In the example of buying speakers, it is likely that when people bring home the ugly speakers that sounded a little better than the attractive ones in the store, the context of choice will not "leak" into the experience of the choice enough to convince people that they made the right decision. But if the consumer can sit at home feeling satisfied knowing that he most certainly chose the best sounding of speakers in the store, he may be comforted enough to conclude that he had chosen well.

Consider another example: choosing between political candidate A, who has 5 years of experience and is extremely handsome, and political candidate B, who has 15 years of experience and is quite homely. Normally, it is very difficult to judge how many years of experience constitutes a lot of experience—is 5 years a lot or a little? In contrast, it is very easy to judge how attractive someone is, even without a basis of comparison. Thus, you might expect that if you ask people to rate one of the candidates (without knowing about the other candidate—a separate evaluation), candidate A would get higher ratings because his experience level is difficult to evaluate but his attractiveness is easily perceived. But when the two candidates are running against one another, voters can compare them and can determine that 15 years of experience is quite a lot. People given the choice between the two candidates (a joint evaluation) will likely choose candidate B. But the research on evaluability suggests that when candidate B takes office, voters are in

separate consumption mode—experience level is no longer perceptible and all they know is that the candidate who won is quite homely. Or will they remember that 15 years of experience is a lot? We submit that, in this example, features of the decision (e.g., the ability to compare years of experience) can be expected to leak into consumption. That is, people will remember that they chose candidate B for a reason and they will be satisfied with their choice, even though experience level is not normally evaluable in the absence of an alternative.

The scope of the effects of leaky rationality is unknown at present. What we are suggesting is that to the extent that leaky rationality operates, it may (p. 714) serve to mitigate affective forecasting errors. Thus, if we are interested in assessing the consequences of these forecasting errors for people's judgments about the quality of their decisions, we must be able to specify when leaky rationality operates and when it does not. This will help to tell us when affective forecasting errors matter, and when they do not.

Conclusion: What Is Rational?

Even so, the literature on affective forecasting is actually quite agnostic about whether people's mispredictions of the future should properly be considered "errors." Gilbert, Wilson, and their various collaborators are interested in pointing out the systematic ways in which people mispredict future subjective experience, but they rarely discuss whether these mispredictions lead people astray in any way that really matters. Said another way, the research on inaccuracies in affective forecasting is concerned more with predicting what people will choose and why they choose it than it is with judging the rationality of people's choices (see Gilbert, 2006, for an extended discussion of the difficulty in judging the rationality of decisions based on anticipated subjective experience).

In contrast, we think the literature on affective forecasting, along with the concept of leaky rationality, raises deep questions about what it means for a decision to be rational. The problem with the subjectivity that is inherent in the concept of utility is that the only grounds for challenging the rationality of decisions are formal ones (e.g., violations of consistency or transitivity). But sometimes, people will feel good about their decisions for bad reasons. When the aim of an experience is entirely subjective (e.g., good-tasting burgers and beer), there is, perhaps, no harm in people fooling themselves. But even here, there are objective aspects to the subjective experience. If people consistently pay more for "75% lean" meat than for "25% fat" meat, they can waste a lot of money. Thus, we challenge the notion that decisions that are objectively bad can be deemed rational as long as people feel good about (i.e., derive utility from) them. Happiness matters, but it is not the only thing that matters.

Keys and Schwartz (2007) suggest that what is needed is a richer conception of rationality that is not tied exclusively to utility—one that embeds individual decisions in lives lived as a whole. It is not enough to examine one decision to pay extra for 75% lean instead of 25% fat; we must examine the consequences (e.g., wasted money) of making that type of decision every day for an entire lifetime. And these long-range consequences can easily

extend beyond the specific domain of the decision (e.g., wasting money on what you eat can limit the resources you have available for other sorts of things). But developing this richer conception of rationality is no easy task, especially at a time and in a culture in which people are reluctant to use any standard for assessing the quality of a life aside from the one adopted by the individual. The attractiveness of “utility” as a concept is that it avoids having to make judgments about what are better and worse decisions—better and worse lived lives. One can fault people for having preferences that are inconsistent, or intransitive. One can, perhaps, fault people for discounting the future so much that they are continually paying big long-term prices for small, short-term satisfactions. These sorts of phenomena can be labeled as mistakes and criticized. But not much else can be. Of course, as Lewis Carroll observed, people can use words in any way they like. But the honorific attached to the word “rational” is unjustified if all it means is “consistent.” For the word to deserve the honorific it has, it needs to refer to substantive aspects of decisions, and not just formal ones.

Future Directions

The research we have reviewed on affective forecasting tells us a lot about how people predict their future subjective states. At the same time, it raises questions for future research. Among the more significant are these:

1. When people evaluate an experience, what counts as an “episode,” over which affective experience (whether moment by moment or peak-end) is integrated and summarized? Is “spring break” one episode, or many? Does it have one peak and one end, or several?
2. How are the positive and negative moments that characterize most real-life experiences combined and integrated? Are there separate positive and negative peaks? Does one get subtracted from the other? Does whichever peak is greater determine whether the experience is summarized as positive or negative?
3. In the determination of life satisfaction, how important are the actual experiences people have, and how important are people’s memories of the experiences?
4. Can we develop a systematic account of hedonic adaptation that explains differences across domains of experience in the time course of adaptation and its magnitude?
- (p. 715)** 5. Does experience in a particular domain affect the likelihood and magnitude of affective forecasting errors? That is, can people learn to prevent or counteract these errors? If so, what teaches them?
6. What role, in what domains, does “leaky rationality” play in mitigating the effects of affective forecasting errors? One can imagine that there will be cases in which “leakage” is substantial (“Boy, this 90% lean beef sure does taste great!”), and cases in which “leakage” is minimal or nonexistent. Can we find anything systematic to distinguish these two types of cases? Are there individual differences such that some people are much more susceptible to “leakage” than others? At present, nothing much is known about the leakage process except that it sometimes occurs.

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Affective Forecasting and Well-Being

Barry Schwartz

Barry Schwartz, Department of Psychology, Swarthmore College, Swarthmore, PA

Roseanna Sommers

Roseanna Sommers, Department of Psychology, Swarthmore College, Swarthmore, PA