

## Emotion in economics (The challenge of emotions for economic theory)

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Through most of the last century, economics ignored emotions. With a few minor exceptions, such as Keynes' famous reference to the role of 'animal spirits' in markets or Adam Smith's (1759) less familiar reference to the influence of the 'passions', economic theory was largely derived from rational, consequentialist assumptions about decision making. That is, standard economic theory assumes that people choose between alternative courses of action based on the desirability or "utility" of their consequences. Further, people are assumed to reveal their preferences through their decisions (Samuelson, 1938); for example, if A is chosen when B is available, a preference for A over B is revealed. While not explicitly denying a role for emotions in the formation of preferences, the very concept of revealed preference was intended to distance economics as much as possible from the need for any involvement in the messy details of human psychology, including emotions.

This situation changed dramatically with the emergence of behavioral economics, a subfield of economics that came of age in the early 1980s and imported research findings and insights from psychology. Behavioral economists identified a wide range of anomalies – common patterns of individual and market behavior that violated the assumptions and predictions of standard theory – and showed how these could be explained by more realistic accounts of human behavior. For example, the anomalous tendency for real estate markets to 'dry up' (i.e., for volume to plummet) during market

downturns could be explained by 'loss aversion' (Tversky & Kahneman, 1991) – the observation that people dislike losses more than they like comparable gains – which causes owners of houses that lose value to hold out for unrealistically high prices to avoid selling at a loss (Genesove & Mayer, 2001).

Behavioral economics has stimulated two waves of research on, and theorizing about, the role of emotions in economic behavior. To understand the difference between the two waves, it is important to distinguish two types of emotions that can influence behavior: expected emotions and immediate emotions (cf. Loewenstein et al., 2001; Loewenstein & Lerner, 2003; Rick and Loewenstein, in press).

Expected emotions are emotions that are anticipated to occur as a result of outcomes associated with different possible courses of action. For example, in deciding whether to purchase a house, a potential home-buyer might attempt to predict the pleasure she would experience from living in the house, as well as the disappointment she would feel if the house declined in price. Immediate emotions, by contrast, are experienced at the moment of choice, and could arise from thinking about the consequences of the decision, though such thoughts are not necessarily the sole cause. For instance, the anxiety experienced while contemplating buying a house may be the result of imagining signing on the dotted line, or lingering thoughts about a loved one's impending surgery. Though only one cause is related to the decision at hand, both could lead to anxiety at the moment of choice.

That expected emotions might influence decision making is perfectly consistent with the idea that people seek to maximize expected utility. For example, one might assign greater utility to a vacation in San Diego than to a vacation in Death Valley

because one anticipates greater happiness while surfing than while melting. However, any influence of immediate emotions on decision making poses a critical challenge to consequentialist economic theory. In particular, if emotions that arise from factors unrelated to the decision at hand ultimately affect the decision at hand, then the fundamental consequentialist assumption that decisions are based on the utility of possible outcomes must be called into question.

Economists have made tremendous progress in understanding how expected emotions influence decision making. Research on decision making under risk, for example, introduced the idea that emotional reactions to the outcomes of risky decisions might depend on gains and losses rather than final levels of wealth (Kahneman & Tversky, 1979). Combined with the notion of loss aversion, this can explain a wide range of otherwise anomalous phenomena, such as the aforementioned drop in housing volume when prices decline. Other research played on the observation that people experience disappointment when outcomes fail to meet expectations, and regret when what they chose ends up being inferior to what they could have chosen. These insights about expected emotions, it turns out, can help to explain why people sometimes make choices that are intransitive (i.e., choose A over B, B over C, and C over A; Gul 1991; Loomes and Sugden, 1986; Mellers et al., 1997; Sugden, 1986).

Research on intertemporal choice introduced the idea that people derive positive and negative emotions not only from outcomes themselves, but also from the anticipation of future outcomes. Taking emotions associated with anticipation (e.g., savoring, dread) into account can explain the otherwise anomalous propensity for people to get unpleasant

outcomes over with quickly instead of deferring them as much as possible, as predicted by standard economic theory (Berns et al., 2006; Loewenstein, 1987).

Research on decision making in social contexts proposed that people derive strong negative emotions from outcomes that are perceived as inequitable (Fehr & Schmidt, 1999; Loewenstein, Thompson & Bazerman, 1989) or unfair (Rabin, 1993). The desire to avoid situations in which they will experience such emotions can potentially explain a wide range of social phenomena, from reciprocal altruism to rejections of lucrative but unfair offers in one-shot games.

More recently, economists have begun to investigate how immediate emotions influence decision making. Casual empiricism and intuition suggest that immediate emotions play an important role in economic behavior. For example, people gamble in part because they derive immediate pleasure from the activity, not just because the expected utility of winning exceeds the expected disutility of losing. Negotiations break down not only because people believe they can get more from the other side through intransigence, or even because they want to avoid experiencing unfair outcomes that will make them miserable, but also because anger sometimes 'blinds' them to their own self-interest. In fact, a very wide range of self-destructive actions occur under the influence of strong emotions, from binge-eating to road rage, 'flaming' in response to an offending email, failing to use contraception in the "heat of the moment," and many other phenomena.

Research on immediate emotion and risky decision making has revealed that the inability to experience fear (due to lesions in brain regions involved in the processing of emotion) can lead brain-damaged subjects to perform worse (Bechara et al., 1997) or

better (Shiv et al., 2005) than non-brain damaged subjects on a gambling task, depending on the parameters of the task. This research strongly suggests that emotions experienced at the moment of choice are not merely epiphenomenal, but rather that immediate emotions influence decision making. More recent work has found that stock market returns are sensitive to incidental emotions caused by sunshine (Hirshleifer & Shumway, 2003) and World Cup outcomes (Edmans, García, & Norli, in press).

There is also evidence that immediate emotions influence intertemporal decision making. Conlin, O'Donoghue, and Vogelsang (2006), for instance, find evidence of "projection bias" (Loewenstein, O'Donoghue, & Rabin, 2003) in catalog orders of cold-weather-related clothing items and sports equipment. Specifically, people are over-influenced by their visceral state at the time they make decisions, as measured by their likelihood of returning the item: a decline of 30° *F* on the date an item is ordered increases the probability of a return by 3.95 percent. Additionally, Walter Mischel (1974) and colleagues have found that children faced with the choice between a small immediate reward (e.g., one marshmallow) and a larger delayed reward (two marshmallows) tend to behave more impatiently when the immediate reward is proximal and, consequently, craved.

Social preferences are also not immune to immediate emotions. Blount (1995), for example, finds that people are more willing to accept unintentionally (randomly generated) unfair offers in one-shot games than intentionally unfair offers. Intentional unfairness is a source of anger, but unintentional unfairness is merely disappointing. Moreover, differential sympathy towards identifiable victims (e.g., Baby Jessica) and statistical victims (e.g., thousands dead in a distant country) likely underlies the tendency

to give more to the former than to the latter (Kogut and Ritov, 2005; Schelling, 1968; Small & Loewenstein, 2003).

In general, research on the role of emotions has yielded a number of important insights. One is that people are effectively transformed by emotions; the same person in different emotional states is likely to behave as differently as two people in the same emotional state. For example, studies that have examined the effect of sexual arousal on decision making have found that sexual arousal dramatically changes people's preferences, moral behavior, risk-taking and their time preference (Ariely & Loewenstein, 2005; Wilson & Daly, 2003). Other studies have found that immediate emotions, whether induced by the nature of the decision at hand or by incidental factors, tend to make people less sensitive to the probabilities of potential outcomes (Rottenstreich & Hsee, 2001). One study by Ditto et al. (2006) had subjects choose whether to spend additional time in an unpleasant experiment in exchange for either a small or large chance of winning cookies. When the aroma of freshly baked cookies filled the laboratory, subjects were insensitive to the probability of winning – they were just about as likely to agree to spend the extra time whether the likelihood of getting cookies was small or large. However, subjects were highly sensitive to the probability of winning when the cookies were merely described, without the accompanying aroma.

Other research shows that people are not very accurate in predicting the impact of emotional states on their own behavior; when in one emotional state, they tend to under-appreciate the impact of other states on the actions they will take. This 'hot-cold empathy gap' (Loewenstein, 1996) has diverse ramifications for judgment and behavior (see, e.g., Nordgren, van der Pligt, & van Harreveld, 2006). For example, the failure to predict the

motivational force of drug craving when one is not currently craving may help to explain why people first take addictive drugs despite full knowledge of the consequences of addiction (Badger et al., in press).

Research on the role of immediate emotions in behavior has been bolstered by a new development in economics called neuroeconomics (see Camerer, Loewenstein, & Prelec, 2005, for review of the field). One of the major insights of neuroeconomics has been that decision making is driven by a combination of deliberation (corresponding, roughly, to preference satisfaction) and emotion (Cohen, 2005). Research by neuroeconomists and their colleagues has found that brain regions associated with deliberation and regions associated with emotion are activated in diverse tasks, including moral judgments (Greene et al., 2001), behavioral responses to fair and unfair offers in the 'ultimatum game' (Sanfey et al., 2003), intertemporal choice (McClure et al., 2004), and decision making under risk (Tom et al., in press).

Research on immediate emotions is key to understanding when the economic model, which assumes rational self-interested behavior, is valid and when it is not – when people behave in a self-destructive or otherwise irrational fashion. In some cases the cause of irrationality seems to be strong emotions that cause people to lose control, which means to make decisions on the basis of immediate rather than expected emotions. In other cases, however, adverse patterns of behavior can be caused by a failure to accurately anticipate future emotional states.

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