Human Behaviour Under Risk and Uncertainty
Are We Really Just Conservative?

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Abstract

Using arguments from evolutionary psychology to describe human behaviour under risk and uncertainty, it is hypothesized that 1) we prefer the status quo, 2) we have a rational tendency towards slight risk aversion, 3) the evolution of private property led to the endowment effect, and 4) loss aversion exists but is merely an artefact of the endowment effect.

Natural selection is a slow process, and *evolutionary psychology* informs us that our minds today are adapted to seeking our ultimate goal of reproduction in the *environment of evolutionary adaptedness* (*EEA*), which roughly coincided with the Pleistocene (Buss 2008). Reproduction is a multiplicative process, so it is the logarithm of population that is additive. *Risk*

aversion exists when an individual prefers a guaranteed payoff to an uncertain payoff with the same expected value. If one is risk neutral in terms of log(population), because the log utility function is concave, it follows that one must exhibit a small degree of risk aversion regarding population. In other words, it is better to have 4 offspring rather than (2 or 6) (Sinn and Weichenrieder 1993), thus justifying risk aversion. Wealth is also generated by a multiplicative process. In order to maximize growth of wealth, one must maximize the expected value of the logarithm of wealth after each period (Kelly 1956; Breiman 1961). If one is risk neutral in terms of log(wealth), it follows that one must exhibit a small degree of risk aversion regarding wealth. So both normatively and most likely descriptively, we have a tendency towards slight risk aversion with respect to utility generated by a multiplicative process.

Further, as the subjective Bayesian de Finetti (1974) famously noted, 'probability does not exist', but we prefer to assign a subjective probability with ease. In other words, we also exhibit a preference for known risks over unknown risks. This is known as *ambiguity aversion*.

In order to reproduce, or assist with the upbringing of close relatives, individuals are motivated to survive for as long as possible. Any living person may ruminate: I have survived thus far, everything that I have already experienced cannot be fatal because I am alive. For example, I have never eaten that berry before, and I have survived, so why should I risk eating it now? The most fundamental bias, therefore, is the *status quo bias* (also known as *conservatism*). The status quo bias can lead to another cognitive heuristic, known as *anchoring* (Tversky and Kahneman 1974), which describes the common human tendency to make decisions based on an initial 'anchor'. We prefer relative thinking to absolute thinking.

The *endowment effect* (Thaler 1980) is the phenomenon in which people value a good or service more once their property right to it has been established. The idea of *loss aversion* is that losses and disadvantages have a greater impact on preferences than gains and advantages. Traditionally, the literature treats loss aversion as an explanation for the endowment effect and the status quo bias (Kahneman, Knetsch and Thaler 1990; Tversky and Kahneman 1991; Kahneman, Knetsch and Thaler 1991). In contrast, Gal (2006) contends that inertia plus fuzzy and ill-defined preferences lead to a propensity towards the status quo which leads to the status quo bias, risk aversion and the endowment effect; he considers the notion of loss aversion to be superfluous. However, I reject both the original theory and Gal's rea-

soning. Living in groups meant that respect for private property would have likely evolved as a Nash equilibrium, and the evolution of private property may well have given rise to the endowment effect (Gintis 2007). If one starts with the endowment effect, then loss aversion is an inevitable consequence. All that is required is for an individual to value something more, let's assume 10% more, if it has been in their possession. If I have three apples, then they are worth 3.3 apples to me. Take one away, and my utility is 2.2 apples; instead of taking one away, add one, and my utility becomes 4.3 apples. That $3.3 - 2.2 > 4.3 - 3.3$ implies loss aversion.

The details of a descriptive account of decision making under risk are best accounted for by *prospect theory* (Kahneman and Tversky 1979), which was superseded by *cumulative prospect theory* (Tversky and Kahneman 1992) and more recent developments such as the *transfer of attention exchange* model (Birnbaum and Chavez 1997). My more fundamental contentions here are that 1) we have a rational tendency towards risk aversion, 2) we prefer the status quo, and 3) loss aversion exists, but is merely an artefact of the endowment effect.

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