

*Practical Project Risk Management*¹

Effects of Heuristics on Risk Estimates: A brief guide²

Purpose

Understand the effects of common mental short cuts (heuristics) on risk estimating. Note that this is a complex and evolving field and that the many and various heuristics identified by research can have overlapping effects. This guidance sheet focusses on those that I have generally found to be the most useful to understand in the context of project risk.

The adjustment heuristic

A range of values (e.g. of risk impact) is estimated by making adjustments from a single point, which may be a pre-existing single point estimate. A single point estimate may be referred to as the anchor. The heuristic causes the estimator to focus on the scenario associated with the anchor estimate and thus fail to take sufficient account of other possibilities. The effect is to produce estimates that are unrealistically narrow. If, moreover, the anchor is, itself, biased the overall risk estimate will be similarly biased; an effect known as anchoring bias.

The adjustment heuristic may be the most important factor behind the phenomenon of almost all people, including experts, making three-point estimates that are too narrow. See the *Three-Point Estimates* guidance sheet (Nov 2022) for an approach that counters this.

The availability heuristic

The estimating process is dominated by the information that is foremost in the estimator's mind. Typically, the effect of this heuristic is to foster unjustified confidence in the information concerned, thus acting as an unconscious obstacle to considering other possibilities. When making estimates for risk, examples of the source of such information might include baseline planning data, a subjective guess made on the basis of inadequate description of the risk involved

¹ This series of articles is by Martin Hopkinson, author of the books "*The Project Risk Maturity Model*" and "*Net Present Value and Risk Modelling for Projects*" and contributing author for Association for Project Management (APM) guides such as *Directing Change* and *Sponsoring Change*. These articles are based on a set of short risk management guides previously available on his company website, now retired. See Martin's author profile at the end of this article.

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or a suggested value from a manager who is minded of the advantages of either high or low risk estimates.

The representativeness heuristic

The risk estimate is extrapolated from recent experience, making the implicit assumption that this experience is representative of the new project context. Whilst the use of learned experience is, of course, essential for estimating, the danger created by this heuristic lies in the unconscious use of assumptions. Daniel Kahneman described how people often unconsciously substitute a difficult question with an easier one. Often the easiest course of action is to simplify an estimate by referring to prior experience without considering how the new project could be different.

Availability and representativeness heuristic effects can both be mitigated with a focus on the quality of risk descriptions and the identification of all significant sources of uncertainty.

The escalation of commitment

The estimating process is contaminated by an earlier estimate that has gained traction, but which is now unrealistic. The unrealistic value acts as a brake, leaving a legacy of bias in subsequent estimates or delaying the time by when realistic estimates become accepted. Large and complex projects with challenging objectives that are treated as being management or political commitments are particularly vulnerable.

Where established estimates have strong support from senior managers, customers or politicians, they can be very difficult to challenge. The best approach is to employ the services of an independent expert with a reputation for competence and honesty.

Conscious vs Unconscious causes of optimism bias

There is evidence that bias in project risk estimates can be caused by conscious choices. Typically the choice is to reduce estimates to unrealistically optimistic levels in order to achieve a short term purpose e.g. to support a politically driven decision. However, it would be a mistake to believe that optimism bias is usually caused by conscious acts; bias often occurs, even when all the people involved act in good faith. A key insight from an understanding of the effect of heuristics is that estimating bias can be caused by unconscious cognitive errors.

Common Faults

1. Failure to gain a good qualitative understanding of a risk before making an estimate e.g. by neglecting to identify all significant sources of uncertainty that are involved.
2. Making three point estimates by starting with an estimate of the “most likely” value.

3. Rewarding or maintaining a management culture that fosters optimistic estimates.
4. Failing to review and alter risk estimates as new or better information becomes available.



About the Author

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Martin Hopkinson, recently retired as the Director of Risk Management Capability Limited in the UK, and has 30 years' experience as a project manager and project risk management consultant. His experience has been gained across a wide variety of industries and engineering disciplines and includes multibillion-pound projects and programmes. He was the lead author on Tools and Techniques for the Association for Project Management's (APM) guide to risk management (*The PRAM Guide*) and led the group that produced the APM guide *Prioritising Project Risks*.

Martin's first book, *The Project Risk Maturity Model*, concerns the risk management process. His contributions to Association for Project Management (APM) guides such as *Directing Change* and *Sponsoring Change* reflect his belief in the importance of project governance and business case development.

In his second book *Net Present Value and Risk Modelling for Projects* he brought these subjects together by showing how NPV and risk modelling techniques can be used to optimise projects and support project approval decisions. ([To learn more about the book, click here.](#))