

## A Roadmap from Full to Bounded Rationality

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Extended Abstract Prepared for the Fourth Herbert Simon Society International Workshop  
Turin, Italy - October 15, 2016

When the similarities and differences between full rationality and bounded rationality have been clarified, one can see that bounded rationality should not be viewed as a deviation from full rationality. It does not make sense to assume that the same axiomatic framework would serve to model both types of rationality.

I believe that the main reason for building models of bounded rationality as departures from full rationality is that modelers of both types of rationality share the same notion of uncertainty about knowledge. In a framework where the (one) correct answer exists prior to the quest, rationality is goal-oriented. I see bounded rationality as a creature with two legs: goal-orientation and cognitive limitations. The first leg of goal-orientation is firmly and rightly placed in the same paradigm as full rationality, but the second leg of cognitive limitations is left in the air because it cannot land on the same ground. Incomplete (but consistent) models of bounded rationality are made by treating the second leg *as if* it belonged in the same ground. I suggest that the problem should be explored more deeply than just trying to modify yet another axiom. The problem might be not that we have chosen the wrong axiom(s) to modify, but rather that we are using an altogether inappropriate axiomatic framework. That is, instead of forcing the second leg to land on familiar ground, let's discover the second leg's origin and then find and implant an appropriate first leg that stabilizes the creature.

It is generally presumed that what bounds rationality is limitations of cognition. The superior descriptive power of current models of bounded rationality comes from their incorporation of these limitations. But in taking this direction, such models implicitly assume that all departures from rationality can be traced to cognitive limitations: this assumption is the step that this second leg needs to take, to follow the first leg of goal-orientation. But it cannot land, because it doesn't belong: it is consistently incomplete!

Goal-orientation, which has *conveniently* been endorsed by bounded rationality modelers and so has not been a matter of debate, is the source of futile modeling. The neglected mistake that followed the convenient endorsement was the placement of the incomplete genuine leg of bounded rationality, together with smuggled goal-orientation leg, in the paradigm of full rationality. As a result, most of the efforts to model the idea of bounded rationality can be characterized as trying to fit this legitimate leg into the standard paradigm (of expected utility and regular probability theory), which is where the first leg belongs. I assert that the efforts to fit the second leg into the same cozy framework as the first will inevitably be futile, because while the power of these models is derived from the uncertainty that they express in bounding limitations, the uncertainty that is inherent in all other features of actual decision making is ignored. That is why I imagine that when the first step is seen to be taken by the new first leg of goal creation, the second leg of non-omniscience will land with it just fine, in its entirety, on the same new ground of inherent uncertainty.

While I believe that the idea of bounded rationality is valuable and should be absorbed into economic studies, the correct way to do so is to replace the first leg, goal-orientation, with an alternative that fits well in the paradigm in which the second leg belongs. Notice that bounded rationality and full rationality share the leg of goal-orientation that I propose to replace with a new one. Notice also that the second leg of bounded rationality does not belong in the current paradigm and so can not be adequately modeled by its practices and tools.

There are many decisions that are difficult to understand without a model of bounded rationality. While bounded rationality has enjoyed immense attention for a long time, among thinkers with wide variety of academic orientations, it still suffers from the lack of a formal structure. A very challenging puzzle has remained unexplored: how do we form a proper axiomatization of somewhat rational individuals? I maintain that the original idea of bounded rationality contains a rich capacity for valuation (as the general basis for any choice), but the effort to fit bounded rationality into the standard economic paradigm emasculates this capacity. I argue that imposing the goal orientation of full rationality on bounded rationality leads to structures that are doomed to fail. Therefore, a shift from the currently predominant paradigm is in order.