Robust Multiplicity with a Grain of Naiveté

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ABSTRACT

In an important paper, Weinstein and Yildiz (2007) show that if players have an infinite depth of reasoning and this is commonly believed, types generically have a unique rationalizable action in games that satisfy a richness condition. We show that this result does not carry over to environments where players may have a finite depth of reasoning, or think it is possible that the other player has a finite depth of reasoning, or think that the other player may think that is possible, and so on, even if this so-called "grain of naiveté" is arbitrarily small. Our results demonstrate that both uniqueness and multiplicity are robust phenomena in this richer environment. In particular, if we do not insist on players having common belief in the event that players have an infinite depth of reasoning, then there need not be a discontinuity in rationalizable behavior when going from a game where payoffs are approximate common belief to one where they are commonly believed.