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Uniqueness conditions for strongly point-rationalizable solutions to games with metrizable strategy sets. (English) [Zbl 1142.91015](#)

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Summary: This paper introduces the iterative solution concept of strong point-rationalizability as a strengthening of standard point-rationalizability by stipulating that any two players have identical beliefs about the strategy choices of their common opponents. By adopting and generalizing the contraction-property approach of *H. Moulin* [*Math. Soc. Sci.* 7, 83–102 (1984; [Zbl 0541.90098](#))] and *D. Bernheim* [*Econometrica* 52, 1007–1028 (1984; [Zbl 0552.90098](#))] we derive sufficient conditions for the existence of unique strongly point-rationalizable strategies in strategic games with best response functions. These uniqueness results are derived under fairly general assumptions and are especially useful for complete and bounded, as well as finite strategy sets. For games with monotonic individual best response functions, equivalence between a unique strongly point-rationalizable and a unique point-rationalizable solution in the standard sense is established. Furthermore, the existence of unique fixed points is proven under conditions that generalize for bounded metric spaces an established fixed point theorem by *F. F. Bonsall* [*Lectures on Some Fixed Point Theorems of Functional Analysis*. Tata Institute of Fundamental Research, Bombay (1962)] and *D. R. Smart* [*Fixed point theorems*. Cambridge Tracts in Mathematics. 66. London: Cambridge University Press (1974; [Zbl 0297.47042](#))]. Possible extensions of our findings to games with multi-valued best response correspondences are discussed.

MSC:

[91A10](#) Noncooperative games

[91A26](#) Rationality and learning in game theory

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Keywords:

iterative solution concepts; point-rationalizability; Nash equilibrium; fixed point theorems; Cournot competition

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