CORRECTION TO "MEASURABLE GAMBLING HOUSES"

BY
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I am indebted to Mr. William D. Sudderth for pointing out an error in my paper *Measurable gambling houses*, Trans. Amer. Math. Soc. **126** (1967), 64–72. The definition of a measurable gambling house (Definition 1, p. 65) is not sufficient to insure the existence of a selection map $\alpha: F \to P$ such that $\alpha(f) \in \Gamma(f)$ for all f. The existence of such maps was implicitly assumed in the proofs of Lemma 1, Theorem 3, and the second result in Theorem 1, and those results are therefore incorrect as stated. The existence of such selection maps is a necessary and sufficient condition for the existence of measurable strategies and of random strategies (Blackwell and Ryll-Nardezewski, *Non-existence of everywhere proper conditional distributions*, Ann. Math. Statist. **34** (1963), 223–225).

A gambling house Γ is said to be leavable if $\delta(f) \in \Gamma(f)$ for all f, where $\delta(f)$ is the gamble which assigns probability one to the fortune f. If Γ is leavable, the required selection maps exist, and the above theorems are true. The second conclusion of Theorem 1 (p. 66) should therefore be modified to read

"... and if Γ is leavable then for any $\varepsilon > 0 \cdots$,"

Lemma 1 (p. 68) should be modified to read

"If Γ is leavable then $R \in \mathscr{B} \times \Sigma^*$,"

and Theorem 3 (p. 70) should be modified to read

"Suppose Γ is a leavable house and let ρ be $\cdots$."

In addition statements on p. 69 referring to Q as the best the gambler could do using random strategies must be considered as valid only for leavable houses.

In nonleavable houses the remaining results (Lemma 2 and the first conclusion of Theorem 1) are valid as stated, and the results referred to above are valid if the gambler is allowed to use *essentially available* measurable or random strategies, i.e., strategies that $\sigma_n(f_1, \ldots, f_n) \in \Gamma(f_n)$ or $\rho_n(\Gamma(f_n) \mid \gamma_0, f_1, \ldots, f_n) = 1$ for all n along a set of histories $f_1, f_2, \ldots$ of probability one under the strategy σ.

Mr. Sudderth has also pointed out that without the assumption of leavability, there exists nearly optimal measurable policies (σ, t) such that σ is available in Γ until time t. That is, for every partial history $(f_1, \ldots, f_n)$, $\sigma_n(f_1, \ldots, f_n) \in \Gamma(f_n)$ if $t(f_1, \ldots, f_n) < n$.

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