

**Corrections and updates for sixth printing of
Osborne and Rubinstein's "A Course in Game Theory"
(MIT Press, 1994)**

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Corrections

<i>Page, Line</i>	<i>Correction</i>
xv	Martin J. Osborne's email address is now <code>martin.osborne@utoronto.ca</code> and his mailing address is Department of Economics, University of Toronto, 150 St. George Street, Toronto, Canada, M5S 3G7.
xv	Ariel Rubinstein's email address is now <code>rariel@tauex.tau.ac.il</code> , his website is <code>https://arielrubinstein.tau.ac.il</code> , and his second address is Department of Economics, New York University, New York, NY 10003, USA.
6, 18	Delete "(first proved by Zermelo (1913))".
7, -13	Insert "nonempty" before "disjoint".
23, 14	Replace the sentence "Note that ..." with "Note that by part (c), the players' Nash equilibrium strategies may be found by solving the problems $\max_x \min_y u_1(x, y)$ and $\max_y \min_x u_2(x, y)$."
30	Add, at the start of line 5, "The result in Exercise 20.4 is due to Nash (1951)."
32	Replace the first two sentences of the paragraph above (32.2) with: "Note that each function U_i is multilinear. That is, for any mixed strategy profile α , any mixed strategies β_i and γ_i of player i , and any number $\lambda \in [0, 1]$, we have $U_i(\alpha_{-i}, \lambda\beta_i + (1-\lambda)\gamma_i) = \lambda U_i(\alpha_{-i}, \beta_i) + (1-\lambda)U_i(\alpha_{-i}, \gamma_i)$."
45, 7	Replace "he" with "she".
50, -2	Replace " $0 \leq \gamma \leq 1$ " with " $0 < \gamma \leq 1$ ".
55, -10	Replace " $\mu_3^2(A)$ " with " $\mu_3^2(B)$ ".
56, -9	Replace "the following exercises" with "Exercises 56.4 and 56.5".
60, 22	Replace "player 1" with "player i ".
60, 23	Replace " $U_i(a_{-i}, a_i^*)$ " with " $u_i(a_{-i}, a_i^*)$ ".
68, -2	Add "infinite" before "decimal". (A number has a unique infinite decimal expansion.)

- 99, 3 Replace “the longest” with “a longest”.
- 99, 4 Replace $\Gamma(h^*)$ with $\Gamma(h', h^*)$ on this line and on lines 6, 8, and 10.
- 99, 5 Replace $s^*|_{h'}$ with $s_i^*|_{h'}$.
- 99, 9 Replace $s_i^*|_{h^*}$ with $s_i^*|_{(h', h^*)}$.
- 100, 7–8 Delete “(a result first proved by Zermelo (1913))”.
- 100, 9 The official version of chess is not finite, because a player has the *option* of declaring a draw once a position is repeated three times. Our argument applies to the version of chess in which a draw is automatic in this case.
- 104, –9, –8 Replace “she” with “he”.
- 107 Replace the first clause of the sentence starting on line 8 with “Player $P(C(t))$ prefers $S(t + 3)$ to $S(t + 1)$ to $S(t + 2)$ for $t \leq T - 3$ ”.
- 108 On the fifth line of Exercise 108.1 insert “strategic form of the” before “modification”.
- 108, –2 Delete “only”.
- 114, –2 Replace “Kuhn (1953)” with “Kuhn (1950, 1953)”.
- 115, 2 Replace “Kuhn (1953)” with “Kuhn (1950, 1953)”.
- 122 Add to A3 the requirement that the Pareto frontier of X be connected.
- 123 In the first display $(M_i(G_i))$ replace “a SPE” with “an SPE”.
- 123 Replace the second sentence of the proof of Step 1 with “By A3 and the continuity of the preference relations, the domain of ϕ is an interval and ϕ is continuous, one-to-one, and decreasing.”
- 138, 1 (except printings 1–3) Change upper limit of sum from T to ∞ .
- 138, 9 Replace t with T (twice).
- 143, –6 In printings 4 and later replace “A payoff profile w ” with “A feasible payoff profile w of G ”. (Note that, according to our definitions, a feasible payoff profile may not be a payoff profile.)
- 144 In Proposition 144.1, replace “an enforceable payoff profile of G ” with “an enforceable convex combination of payoff profiles of G ”. [The coefficients in the convex combination are not necessarily rational.]
- 152, 11 Change “it” to “if”.
- 156, 3 Replace the sentence starting “Consider” and the following sentence with “Consider a strategy \hat{s}_i of player i that differs from s_i only in that after the history (a^1, \dots, a^{t-1}) it chooses a_i , and after any longer history h it chooses an action that, given the profile $s_{-i}(h)$ of actions planned by the other players after the history h , yields at least i ’s minmax payoff. The outcome of (s_{-i}, \hat{s}_i) is a terminal history \hat{a} that is identical to a through period $t - 1$; $u_i(\hat{a}^t) > u_i(a^t)$ and $u_i(\hat{a}^r) \geq u_i(a^r)$ for $r \geq t + 1$.”
- 159–160 The sketch of the proof of Proposition 160.1 is flawed. It has been replaced. (The text has been rewritten, moving the result to page 159, where it appears as Proposition 159.1.)

- 185, 5 After the colon modify the text to read: “for example, if $\gamma = 2$, $|N| = 2$, and $\theta_i = 1$ for both players then the associated game has also, in addition to $(1, 1)$, inefficient equilibria (e.g. $(0, 0)$)”.
- 200, -17 Delete “by a player”.
- 200, -11 Replace “after the history h ” with “after the history h if $P(h) \in N$ and chance if $P(h) = c$.”
- 201 Replace the paragraph starting on line -2 with: “Note that Definition 200.1 extends our definition of an extensive game with perfect information and chance moves (see Section 6.3.1) in the sense that the extensive game with perfect information and chance moves $\langle N, H, P, f_c, (\succsim_i)_{i \in N} \rangle$ may naturally be identified with the extensive game $\langle N, H, P, f_c, (\mathcal{I}_i)_{i \in N}, (\succsim_i)_{i \in N} \rangle$ in which every member of the information partition of every player is a singleton.”
- 215, 5 Replace “the sets of actions” with “the sequences of actions”.
- 216, -6 Replace the mathematical expression with $p^2 \cdot 0 + p \cdot (1 - p) \cdot 1 + (1 - p) \cdot 0 = p(1 - p)$.
- 217, -2 Replace “Kuhn (1953)” with “Kuhn (1950, 1953)”.
- 218, 3 Replace “Kuhn (1953)” with “Kuhn (1950, 1953)”.
- 226, 1 Replace from the start of the line to the end of the sentence with “equilibrium since the associated assessment violates sequential rationality at player 2’s (singleton) information set.”
- 226, 5 Replace $\beta_2^\varepsilon(C)(c) = 1 - 2\varepsilon$ with $\beta_2^\varepsilon(C)(d) = 2\varepsilon/(1 - \varepsilon)$.
- 229 In the sixth line of Exercise 229.1, replace “ S ” with “ s ”.
- 252 At the end of Example 252.1 the perturbed strategy of player 3 should be $\sigma_3^\varepsilon(R) = \sigma_3(R)$ if $\sigma_3(R) < 1$, and $\sigma_3^\varepsilon(R) = 1 - \varepsilon$ if $\sigma_3(R) = 1$.
- 260 After “for all coalitions S and T ” on the last line add “, where $v(\emptyset) = 0$ ”.
- 263 On line 12, insert “for all $S \in \mathcal{C}$ ” before “by the left-hand inequality”, and replace the last sentence of this paragraph with “Thus $x(N) = v(N)$, so that the payoff profile x is in the core.”
- 274 Add, between lines 7 and 8, the following paragraph. “Now, for every agent i we have $x_i - \omega_i + \varepsilon \in Q$ for every $\varepsilon > 0$, so that $p(x_i - \omega_i + \varepsilon) \geq 0$. Taking ε small, we conclude that $px_i \geq p\omega_i$ for all i . But x is an allocation, so $px_i = p\omega_i$ for all i .”
- 287, 7 Replace \geq at end of line with \leq .
- 307, 7–8 Replace \succsim'_1, \succsim_2 with \succsim'_i, \succsim_j (twice).
- 307, 15 Replace $p \cdot x \succsim_j x^*$ with $p \cdot x \succ_j x^*$.
- 327 Replace “Recherche” with “Recherche” on line -10.
- 335, 3 Replace “[85]” with “[84]”.
- 336, 3 Replace “[115]” with “[114]”.
- 339 Delete reference to Zermelo (1913).

Additional References

The modifications on pages 114, 115, 217, and 218 require the following additional reference.

Kuhn, H. W. (1950), “Extensive Games”, *Proceedings of the National Academy of Sciences of the United States of America* **36**, 570–576.
[114, 115, 217, 218]