ERRATUM TO THE MAHONIAN PROBABILITY DISTRIBUTION ON WORDS IS ASYMPTOTICALLY NORMAL

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The number of inversions $M_{a_1,\dots,a_m}$ in a word studied in our paper [1] is a well-known quantity in statistics. It is equivalent to the test statistics by Jonckheere [3] and Terpstra [6] and it can be seen as a case of Kendall's τ with ties; the two-letter case is the Mann–Whitney test statistic [4]. The asymptotic normality is also well-known; the two-letter case was shown already by Mann and Whitney [4], and a proof that applies in the same generality as our Theorem 1.2 (allowing an unbounded number of letters) is given by Diaconis [2, p. 128–129]. For the two-letter case, Takács [5] gave a local limit theorem, with more restrictive conditions than ours but with an explicit error bound.

References

[1] E. R. Canfield, S. Janson and D. Zeilberger, The Mahonian probability distribution on words is asymptotically normal. *Adv. Appl. Math.* **46** (2011), no. 1–4, 109–124.
[2] P. Diaconis, *Group Representations in Probability and Statistics.* Institute of Mathematical Statistics, Hayward, CA, 1988.
[3] A. R. Jonckheere, A distribution-free k-sample test against ordered alternatives. *Biometrika* **41** (1954), 133–145.
[4] H. B. Mann and D. R. Whitney, On a test whether one of two random variables is stochastically larger than the other. *Annals of Mathematical Statistics* **18** (1947), 50–60.
[5] L. Takács, Some asymptotic formulas for lattice paths. *J. Statist. Plann. Inference* **14** (1986), no. 1, 123–142.
[6] T. J. Terpstra, The asymptotic normality and consistency of Kendall's test against trend, when ties are present in one ranking. *Indagationes Math.* **14** (1952), 327–333.

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