

Erratum to: Central Limit Theorems for Exchangeable Random Variables When Limits are Scale Mixtures of Normals

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In this note, we acknowledge some mistaken criticisms made in our 2003 paper [2] about paper [1] based on a misreading and therefore a subsequent misunderstanding of the results in [1]. Consequently, Examples 2.1–2.2 in [2] should only be read as supporting Theorem 2.1–2.2 in our paper [2], not as counterexamples to the results in [1] as previously claimed. In particular, the following sentences in [2] should be deleted:

- Page 547, last sentence of paragraph prior to display (1.12), delete “However, their results and proofs are flawed as discussed in Sect. 2 of this paper.”
- Page 548, 3rd to 4th lines, delete “(It also gives a counterexample to the necessity parts of Theorems 3 and 4 in Fortini *et al.*⁽¹³⁾)”.
- Page 548, delete the second to the last paragraph “This example also shows that Theorems 3 and 4 in Fortini *et al.*⁽¹³⁾ are not valid as stated.”
- Page 550, 4th line to the end of the first paragraph, delete “The proof of Theorem 3 in Fortini *et al.*⁽¹³⁾ assumes that the mixture comes from de Finetti’s representation but no sufficient condition is provided in the theorem. In fact, they assume this condition throughout their paper without noticing it. The following example

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shows Fortini *et al.*⁽¹³⁾’s statement “the class of limiting laws can be characterized in terms of (scale) mixtures of stable laws,” is not valid, when $\{X_i, i \geq 1\}$ are exchangeable. In fact, if one only assumes the weak convergence of the laws of $(\sum X_i - a_n)/b_n$ when X_i ’s are exchangeable, then how the weak limit is obtained can be very complicated.”

- Page 550, delete Example 2.2 (6 lines in total) which is no longer of relevance to the current paper due to the previous deletion.

We are grateful to Fortini, Ladelli, and Regazzini for their written communication which not only brought to our attention the incorrectness of the above mentioned statements, but also contains a proof that Theorem 2.1 in [2] can be deduced, in a more general form, from propositions presented in their paper [1]. Based on a correct understanding of their results in [1], we see that those results are extremely nice and very general. The techniques employed in [1] overcome difficulties arising in several other methods for proving that suitable sufficient conditions for central limit theorems are in fact necessary. Fortini *et al.* plan to include a description of how Theorem 2.1 in [2] can be deduced from the results of [1] in their forthcoming review of results on the central limit theorem for (partially) exchangeable random variables. We sincerely apologize to the authors of [1] for the mistaken conclusions we drew from misreading and therefore not correctly understanding their results.

References

1. Fortini, S., Ladelli, L., Regazzini, E.: A central limit problem for partially exchangeable random variables. *Theory Probab. Appl.* **41**(2), 224–246 (1996)
2. Jiang, X., Hahn, M.G.: Central limit theorems for exchangeable random variables when limits are scale mixtures of normals. *J. Theor. Probab.* **16**(3), 543–570 (2003)