Short Note: A Correction in “Partial Representations of Orderings”*

G. Bosi

*Dipartimento de Scienze Economiche, Aziendali, Matematiche e Statistiche,
Università degli Studi di Trieste, Piazzale Europa 1, I-34127, Trieste, Italia
GIANNI.BOSI@deams.units.it*

A. Estevan[†]

*Departamento de Estadística, Informática y Matemáticas,
Universidad Pública de Navarra, Campus Arrosadía, Pamplona, 31006, Spain
asier.mugertza@unavarra.es*

M. Zuanon

*Dipartimento di Economia e Management, Università degli Studi di Brescia,
Contrada Santa Chiara 50, 25122 Brescia, Italy
magali.zuanon@unibs.it*

Received 8 April 2019

Revised 6 May 2019

This short note, which has been agreed with the authors involved, is devoted to correct an error in Ref. 1.

1. Correction

In Ref. 1, the authors studied the idea of partial representability. In order to illustrate some of these ideas, they introduced some examples. One of these examples was commented in a final remark as a possible counterexample for following theorem of Evren and Ok:²

Theorem 1. *Let X be a topological space with a countable basis. If $\precsim$ is a near-complete upper (lower) semicontinuous preorder on X , then it has an upper (lower) semicontinuous finite multi-utility representation.*

*Corrections to the paper published in Vol. 26, No. 3 (2018) 453–473, <https://doi.org/10.1142/S0218488518500228>

[†]Corresponding author.

However, that counterexample was not correct at all. The mistake lies in the fact that the example fails to satisfy the hypothesis of the theorem, hence, it is not a counterexample. In particular, the lower contour set $L_{\preceq}(0'5)$ of the example fails to be closed.

The error was driven by the authors' misunderstanding of a statement in Evren and Ok's proof. Upon a more detailed examination, the authors now think that the theorem is correct, as stated by Evren and Ok. The only notable issue is that the proof of the lower semicontinuous representation, which is omitted by Evren and Ok, is slightly different than that of the upper semicontinuous representation. Specifically, the former representation requires one to focus on upper contour sets, as opposed to lower contour sets, after applying Dilworth's decomposition theorem.

Acknowledgements

Asier Estevan acknowledges financial support from the Ministry of Economy and Competitiveness of Spain under grants MTM2015-63608-P and ECO2015-65031. Gianni Bosi and Magalí E. Zuanon acknowledge financial support from the Istituto Nazionale di Alta Matematica "F. Severi" (Italy).

References

1. G. Bosi, A. Estevan and M. Zuanon, Partial representations of orderings, *Int. J. Uncertainty Fuzziness Knowledge-Based Systems* **26**(03) (2018) 453–473.
2. O. Evren and E. A. Ok, On the multi-utility representation of preference relations, *Journal of Mathematical Economics* **47** (2011) 554–563.