Reply to comments

Reply to comments on "Surname distribution in population genetics and in statistical physics"

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I can only agree with almost all the observations made in the Comments, and I will only stress some points complementing my review or suggesting new promising lines of investigation. I will also quote the most relevant recent contributions, missing in the review and suggested by the comments.

Baek and Kim correctly point out the heterogeneity of surname distributions, and suggest that in general scaling laws must be seen as the most random outcome under certain constraints; hence the analysis should focus on the constraints and not on the specific dynamics [1]. In the RG approach this would correspond to focusing on the *relevant* field operator associated with the introduction of new surnames.

Boattini and Pettner offer a convincing explanation of the relative decline of biodemography in the last decade (based especially on the advent of easier end cheaper technologies for DNA typing, and partially on the difficulties raised by polyphyletism). However they stress that there is still much interest in comparing surnames and Y-chromosome haplotypes and indicate the existence of several possible directions for a fruitful interdisciplinary approach (among them anthropology, forensics [2], genetic genealogy [3] and especially linguistics [4]).

Maruvka and Shnerb underline the connection of the statistical approach to surname studies with many other developments, not only in population dynamics, but also in the theory of scale-free networks. However they raise a number of technical problems that should be the object of further analysis, among them the limiting assumptions of fixed size or fixed growth rate of the population, and the difficult comparison of theoretical models with empirical data generated by sampling [5]. As a side comment I would like to stress that the application of surname statistics to the study of nepotism in the academia has been the object also of one of the references quoted in my review [6].

Also Manrubia stresses the importance of shifting the attention from the commonalities to the dissimilarities. She also underlines the relevance of surname patterns to solve questions in history and anthropology (migratory phenomena, transmission of cultural traits) and suggests the possibility of deriving a "surname phylogenies" in analogy with linguistic phylogenies, and exploring second and higher order contributions to the composition of human groups.

Zanette emphasizes the problems raised by polyphyletism, and suggests an extensive analysis of this aspect of surname dynamics, as well as a better exploration of the mechanisms of surname mutation, possibly in connection with the study of linguistic evolution. He also stresses the lack of a rigorous analysis of the mutual compatibility of the theoretical methods applied to the study of surname dynamics. To this purpose I would like to notice that one of

the aims of my review was to show that many of the results presented in the literature are substantially equivalent since they basically derive from different representations of the same Yule–Simon process.

References

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[4] Manni F, Heeringa W, Nerbonne J. To what extent are surnames words? Comparing geographic patterns of surname and dialect variation in the Netherlands. Lit Linguist Comput 2006;21:507–27.
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