Additional results (not peer reviewed) supporting those reported in "Reputation shortcoming in academic publishing"

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Note: References to figures labeled as figure XX relate to figure of the article. Those labeled as supplementary figures XX refer to the supplementary materials of the article. Those labeled additional figures XX refer to figures referenced in this file. References to paragraphs in the format §X.X.X. with numbers higher or equal than 1.5.X such as §1.6.6.1 relate to paragraphs of the supplementary materials of the article. References to paragraphs §1.1.X to §1.4.X relate to paragraphs of this file unless explicitly mentioned.

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1. Additional results

1.1. Robustness of results reported in the article

1.1.1. Comparison of the characteristics of editors excluded from the analyses to the ones of editors included in the analyses

The goal of this analysis was to check that editors who were excluded from the analyses had profiles similar to those of editors who were included in analyses.

We compared the duration of the research experience after the doctorate of the 116 editors who were excluded from the analyses for homonym reasons (figure 1B of the article) to the one of the 190 editors included in the analyses reported in the main text. We did the same for the proportion of editors who had only a doctorate (PhD or MD).

The excluded editors (N=70 with an available duration of research experience after the doctorate out of 116) had durations of research experience after the doctorate similar to those of the editors included in the analyses (N=135 with an available duration of the research experience after the doctorate out of 190; mean (SD): 5.06 years (3.96) vs 4.74 years (2.67) respectively, p=0.57). The proportion of editors who had only a PhD or MD was similar in the two groups (31.4% in the editors who were excluded vs 23.7% in the editors who were included in the analyses respectively, p=0.42).

These results showed that the removal of the 116 editors is unlikely to have biased the results reported in the article.

1.1.2. Analysis reported in §1.9.3.1

The results of this analysis may have been biased by the methods used to address homonyms among authors and editors:

- The inclusion in the analysis of all co-authors vs the first group of co-authors,
- The use of the algorithm of §1.6.6.2 to identify homonyms among authors,
- The use of a fixed threshold to identify homonyms among authors,
- The threshold value used in the algorithm of §1.6.6.2 and for the fixed threshold method to identify homonyms.

Within the last two methods, the threshold used to remove homonyms (i.e. *average+5*SD*) may also have biased the results. Note that the last two methods remove also the contributions of the most prolific authors who are a minority and whose number of publications may bias the results.

We therefore re-ran the analysis of §1.9.3.1 (i.e. the linear mixed model without the additional regressors of the editor's experience in scientific research and the number of articles published by the editor before joining *Nature* journals) using the thresholds *average+3*SD*, *average+4*SD*, *average+6*SD* and *average+7*SD*. This analysis included all co-authors of the editor and a fixed threshold to identify homonyms among authors. The difference between the increase (after the editor's recruitment in his/her journal as compared to before) in the number of articles published in the editor's journal by editor's co-authors and the other authors was still significant for all thresholds (additional figure 2A, $p<0.00002$) used to remove homonyms among authors. Similar results were obtained when using the algorithm of §1.6.6.2 to identify homonyms among authors (additional figures 1A and 2A, $p<0.00001$) except for the threshold *average+3*SD* for which there was only a trend (additional figure 2A, $p=0.099$).

The computation of the number of articles published by editor's co-authors may also have been biased by editor's homonyms who would have not been discarded from the analyses by the algorithm of §1.6.6.2. We thus checked whether the results reported in figure 1A were also observed when co-authors of the editor were also filtered. We used the co-authors of the first group of co-authors identified with the algorithm of §1.6.6.1.

We re-ran the analysis of §1.9.3.1 (i.e. the linear mixed model without the additional regressors of the editor's experience in scientific research and the number of articles published by the editor before joining *Nature* journals) using the co-authors of the first group of articles identified with the algorithm of §1.6.6.1 instead of all co-authors of editors. A fixed threshold was used to identify homonyms. Results were similar to the ones of figure 2A of the article: compared to the other authors, former co-authors of the editor had a higher increase in publications after the editor's appointment (additional figure 1B, $p<0.00001$). Additionally, results obtained with the thresholds *average+3*SD*, *average+4*SD*, *average+6*SD* and *average+7*SD* were consistent with the ones of supplementary figure 6A (additional figure 2B, $p<0.003$).

We reran this analysis using the thresholds *average+3*SD*, *average+4*SD*, *average+6*SD* and *average+7*SD* and the algorithm of §1.6.6.2 to address homonyms among authors. The analysis included only the first group of co-authors of the editor identified by the algorithm of §1.6.6.1. The difference between the increase (after the editor's recruitment in his/her journal as compared to before) in the number of articles published in the editor's journal by editor's co-authors and the other authors was still significant for all thresholds (additional figure 1C, $p<0.00001$) used to remove homonyms among authors. Similar results were obtained when using the thresholds *average+3*SD*, *average+4*SD*, *average+6*SD* and *average+7*SD* to identify homonyms among authors (additional figure 2B, $p<0.00001$) except for the threshold *average+3*SD* for which there was no difference between editor's co-authors and the other authors (additional figure 2B 6B, $p=0.42$).

We also re-ran the linear mixed model with the additional regressors in order to check whether we obtained the same pattern of significant results as the ones reported in the main text. The increase (in the number of original articles published in the editor's journal after the editor's recruitment by his/her journal as compared to before) was associated with the editor's time spent in academic research when using the algorithm of §1.6.6.2 to remove homonyms with all co-authors (beta value (SEM): 0.092 (0.026), $p=0.0003$) but not with the increase in publications of the other authors (beta value (SEM): 0.011 (0.01), $p=0.26$). The difference between the two groups of authors was significant ($p=0.0006$). Similar results were obtained when using the fixed threshold or the algorithm of §1.6.6.2 to remove homonyms with the first group of co-authors (beta value (SEM): 0.15 (0.037), $p=0.00008$ for the association with the increase in publications of editor's co-authors; 0.02 (0.014), $p=0.16$ for the association with the increase in publications of the other authors; 0.11 (0.036), $p=0.003$ for the association with the increase in publications of editor's co-authors; 0.019 (0.014), $p=0.18$ for the association with the increase in publications of the other authors respectively). Likewise in §2.1.3 of the supplementary materials, when using the algorithm of §1.6.6.2 to remove homonyms among authors and when including all co-authors of the editor, there was no association between the number of original articles published as first or last author by the editor during his/her research career and the increase in publications in the editor's journals of co-authors or of the other authors (beta value (SEM): -0.008 (0.041), $p=0.84$; 0.006 (0.015), $p=0.68$ respectively). Similar results were obtained when restricting co-authors to the first group identified with the algorithm of §1.6.6.1 (beta value (SEM): -0.064 (0.061), $p=0.29$ for the association with the increase in publications of editor's co-authors; -0.0006 (0.019),

p=0.97 for the association with the increase in publications of the other authors; -0.032 (0.059), p=0.59 for the association with the increase in publications of editor's co-authors; -0.00004 (0.019), p=0.99 for the association with the increase in publications of the other authors respectively). These results were robust with regard to the threshold used: *average+3*SD*, *average+4*SD*, *average+6*SD* and *average+7*SD* (additional figures 3A and 3B, p<0.04) except for the threshold *average+3*SD* with the algorithm of §1.6.6.2 for which there was no difference between editor's co-authors and the other authors (additional figure 3B, p=0.11). These results were consistent with the ones reported in the article (see §2.1.3 of the supplementary materials) and with the ones reported in figure 2B.

When analyzing the first group of co-authors of the editor with the algorithm of §1.6.6.2 and the threshold *average+3*SD*, there was no difference between editor's co-authors and the other authors for the increase in publications after the editor's appointment as well as for the association of this increase with the editor's experience. This may be explained by the too conservative threshold. It led to exclude from the analyses all authors with strictly more than 2 articles published in the editor's journal over the four years of interest (i.e. the two years before the editor's appointment and the two years after). This threshold led to divide by more than 2.5 the number of co-authors of the editor included in the analysis. This may have led to a lack of statistical power as compared to the other thresholds. Additionally, the first group of co-authors of the editor may miss by construct of the algorithm of §1.6.6.1 some co-authors contrary to the full group of co-authors identified. This lack contributes to increase the lack of statistical power. Therefore, the lack of difference between editor's co-authors and the other authors for this analysis is likely the consequence of a lack of statistical power.

We therefore can consider that the results reported in figure 2A were robust.

The number of editors included in this analysis is substantially lower (n=56) than the 190 editors included in the other analyses (figure 1B of the article). The rationale is that we could include only editors for whom at least one co-author published at least one article during the two years before the editor's appointment or the two years after. We tested whether there was a difference in editors' characteristics between editors included in the analyses and the ones excluded because they had no co-author who published at least one article in the editor's journal during the two years before or after the editor's appointment at his/her current *Nature* journal. Editors included in the analysis had experiences in research longer than those of the excluded editors (mean time spent in academic research including the doctorate (SD): 9.6

years (3.9 years) vs 7.9 years (4 years) respectively, p=0.01). Consistently, editors included in the analysis published a higher number of articles as first or last author during their academic research career than editors excluded from the analyses (mean (SD): 2.93 articles (2.59) vs 1.28 articles (1.66) respectively, p<0.0001). However, editors included in the analysis and editors excluded from the analysis had a similar editorial experience at *Nature* journals (mean time spent as editor in any *Nature* journal (SD): 5.1 years (3.8 years) vs 6.7 years (6.9 years) respectively, p=0.1). The difference in experience in research and in publication record between editors included in the analysis and those excluded may explain why editors were excluded from the analysis. Editors with a shorter experience in research have likely published fewer articles. Editors with fewer articles published have potentially a lower number of co-authors. Thus these editors have a lower probability than the other editors to have a co-author who published in *Nature* journals during the two years before their appointment or the two years after. This difference has little chance to account for our results reported in figure 2A of the article. The number of articles published by editors during their academic research career was not associated with the difference in increase of the number of article published by co-authors after the editor's appointment as compared to before (see §2.1.3 of the supplementary materials and the results of the associated robustness analysis mentioned above).

1.1.3. Analysis reported in §1.9.3.2

Biases in this analysis are the same as in §1.3.2. The results of this analysis may have been biased by the threshold used to remove homonyms (i.e. *average+5*SD*), the method used to identify homonyms (i.e. a fixed threshold, see §1.6.6.2) and the identification of homonyms among editor's co-authors. We therefore re-ran the analysis of §1.9.3.2 (i.e. the logistic regression with mixed effects) using the algorithm of §1.6.6.2, threshold values *average+3*SD*, *average+4*SD*, *average+6*SD* and *average+7*SD* and the first group of co-authors of the editor identified with the algorithm of §1.6.6.1. The use of the first group of co-authors of the editor and the use of all identified co-authors of the editor allow to obtain lower and upper bounds for the results: the first group of co-authors may be too restrictive while all co-authors of the editor may contain homonyms.

Among authors with the same publishing record in the editor's journal before the editor's appointment, the higher probability of editor's co-authors to publish after the editor's

appointment was significant for all thresholds (additional figures 3C and 3D, $p \leq 0.007$) except for the algorithm of §1.6.6.2 used with the threshold *average+3*SD* for which there was no increase in probability for the editor's co-authors both when including only the first group of co-authors of the editor or all co-authors (additional figure 3C, p=0.31 and additional figure 3D, p=0.37). Likewise in §1.3.2, this lack of difference may be explained by the too conservative value used for the threshold. It led to exclude from the analyses all authors with strictly more than 2 articles published in the editor's journal before his/her appointment. Therefore, the linear regressor of the authors' publishing record in the logistic regression had only two possible values: 1 and 2. Two values allow to fit a slope. A linear regressor is a slope. Therefore, a linear regressor with only two values cannot be included in a logistic regression. It should be transformed into a categorical regressor. Results for the threshold *average+3*SD* cannot therefore be considered in the assessment of the robustness of the results. Of note is that for the four other threshold values, the odds ratios were of similar order of magnitude. This makes therefore the results robust with regards of the thresholds used to remove homonyms.

We therefore can consider that the increase in the estimate of the chances to publish in the editor's journal by editors' co-authors was robust.

Differences in characteristics of the editors included in this analysis as compared to the 190 editors considered for statistical analyses (figure 1B of the article) are addressed in §1.3.2. The set of editors included in this analysis is the same as the one included in the analysis of §1.3.2.

1.1.4. Analysis reported in §1.9.3.3

The result may have been biased by the duration of the editorial process. Articles submitted right after the start of an editor at *Nature* journals are published several months later (average median duration across journals: 181 days [20]). Additionally, editors at *Nature* journals undergo a training (see §2.4.4 of the supplementary materials).

To take into account the duration of the editorial process and the duration of the training of editors, we shifted by eight months (see the figure in the third step of §1.6.3) the start of the two-year time window of interest (i.e. the two years before the editor's appointment at *Nature* journals and the two years after) in the analysis reported in the main text. The results may thus

have been biased by the value of this shift or by the duration of two years of the time window of interest.

To check that this time shift and the duration of the time window did not bias the results, we re-ran the analysis of §1.9.3.3 for each alternative time shift (i.e. 6, 7, 9 and 10 months) and each alternative duration of the time window (i.e. 1, 3, 4, 5, 10 years and the entire-range of publication of the journal). For all durations of the time window and all time shifts, supplementary figure 5E shows that there was a difference in the increase after the editor's appointment (as compared to before) in the number of articles published by authors whose affiliation was one of the academic affiliations of the editor before he/she joined *Nature* journals ($p<0.007$). Contrary to the analysis of §1.9.3.3, we removed the differences which were higher or lower than the *average+3*SD* of the difference in the increase in the number of articles between those published in the editor's journal and those published in the other *Nature* journals. This allowed to check that the results of supplementary figure 2A od the supplementary materials were not driven by outliers. This filtering may also explain the difference between supplementary figure 2A and additional figure 1E when comparing, after the editor's appointment and before, the number of articles published in the editor's journal by authors whose affiliation was one of the academic affiliations of the editor before he/she joined *Nature* journals.

The exponential shape (i.e. $\alpha * \left(1 - \beta * e^{\frac{-t}{\tau}}\right)$ with α, β and τ being constants and t representing time in years) of the curves of additional figure 1E cannot ground any hypothesis regarding an effect of the duration of the time window (see §1.6.10).

1.1.5. Analysis reported in §1.9.3.4

Result 1: the rate of original articles published by only new authors in *Nature* journals decreased over years while it was the opposite for articles by known intermediate authors.

This result may have been biased by the duration of the time window used to define new authors. We thus re-ran the analysis of result 1 of §1.9.3.4 for each alternative duration used to define a new author (i.e. 1, 3, 4, 5, 10 years and the entire-range of publication of the journal). Additional figure 4A showed that the slope between time and the rate of original

articles stayed in the same order of magnitude as the association reported in figure 2C of the article for each category of journal (i.e. generalist/specialized) and for each type of article considered (i.e. articles by only new authors and articles by known intermediate authors). In the worst case (i.e. use of the entire time range of publication of the journal to define a new author), the slope was still significant for articles by only new authors in both types of journals (i.e. generalist or specialized, $p=0.0001$ and $p<0.0001$ respectively). For articles of known intermediate authors, the slope was also still significant in the worst case (i.e. use of one year to define a new author) for both type of journals (i.e. generalist or specialized, $p<0.0001$ and $p<0.0001$ respectively).

The result may also have been biased by the removal of homonyms. We re-ran the analysis of §1.9.3.4 except that we did not consider as new authors the authors with more than 50 articles published in the same journal. We used a duration of two years for the definition of a new author. Results were consistent with the ones reported in the main text (slope (SEM): -1.36 (0.29), $p<0.0001$ for articles by only new authors in generalist journals; -2.03 (0.15), $p<0.0001$ for articles by only new authors in specialized journals; 0.53 (0.08), $p<0.0001$ for articles by known intermediate authors in generalist journals; 0.54 (0.04), $p<0.0001$ for articles by known intermediate authors in specialized journals, additional figure 4B).

Result 2: the scientific and editorial experience of editors was associated with the temporal dynamics of publications with only new authors and of articles with known intermediate authors.

This result may have been biased for the same reasons as for result 1.

We thus re-ran the analysis of result 2 of §1.9.3.4 for each alternative duration used to define a new author (i.e. 1, 3, 4, 5, 10 years and the entire-range of publication of the journal). The additional figure 4C showed that the temporal dynamics of publications of only new authors was modulated by the time spent in research by editors and their editorial experience when the duration used to define new authors was in the range of one ($p=0.06$ (trend only) and $p=0.006$ respectively) to four years included.

The result may also have been biased by the removal of homonyms. We re-ran the analysis of result 2 except that we did not consider as new authors the authors with more than 50 articles

published in the same *Nature* journal. Results (additional figure 4D) were consistent with the ones reported in the main text (additional figure 2B).

1.1.6. Analysis reported in §1.9.3.5

Result 1: the number of original articles by new first and last authors in *Nature* and *Nature Communications* decreased the year after a decrease of the IF of the journal and vice-versa. This decrease was stronger than for articles of established first or last authors.

This result might have been biased by the duration of the time window used to define new authors. We thus re-ran the analysis of result 1 of §1.9.3.5 for each alternative duration used to define a new author (i.e. 1, 3, 4, 5, 10 years and the entire-range of publication of the journal). In the worst case (i.e. use of the entire time range of publication of the journal to define a new author), the association between the variation of the number of original articles by new first and last authors the year after (i.e. number of articles at year n+1 – number of articles at year n) and the variation of IF the year before (i.e. IF of year n – IF of year n-1) was still significant (p=0.0007, additional figure 6B). However, for known first or last authors and a length of the time window of one year, there was no association: this was the worst case for known first or last authors (p=0.43, additional figure 6B). These two associations (the one for articles by new first and last authors and the one for articles by a known first or last author) differed between the two categories of authors for all lengths of the time window except for a length equal to the entire-range of publication of the *Nature* journal for which there was only a trend (p=0.06, additional figure 6B).

The result might also have been biased by the removal of homonyms. We re-ran the analysis of result 1 except that we did not consider as new authors the authors with more than 50 articles published in the same *Nature* journal. Results were consistent with the ones reported in the main text (additional figure 6D to be compared to figure 3A of the article).

Result 2: the number of original articles by new first and last authors in *Nature* and *Nature Communications* decreased at year n+2 as compared to year n+1 when the IF of the journal decreased at year n as compared to year n-1 and vice-versa.

Like result 1, this result might have been biased by the length of the time window used to define new authors. We thus re-ran the analysis of result 2 of §1.9.3.5 for each alternative duration used to define a new author (i.e. 1, 3, 4, 5, 10 years and the entire-range of publication of the journal). The association between the variation of the number of original articles by new first and last authors two years after (i.e. number of articles at year n+2 – number of articles at year n+1) and the variation of IF the year before (i.e. IF of year n – IF of year n-1) was significant for all lengths of the time window except for a length equal to the entire-range of publication of the *Nature* journal for which there was only a trend (p=0.07, additional figure 6B). For the number of known first or last author, the association was significant except for a duration of the time window of 1 year (p=0.23, additional figure 6B).

The result might also have been biased by the removal of homonyms. We re-ran the analysis of result 1 except that we did not consider as new authors the authors with more than 50 articles published in the same *Nature* journal. Results were consistent with the ones reported in the main text (additional figure 6D to be compared to figure 3A of the article).

Result 3: the relationship between the variations of the number of original articles of new first and last authors (number of articles at year n+1 – number of articles at year n) and the variations of the IF between year n and year n-1 (IF of year n – IF of year n-1) increased across years while it was not the case for articles with a known first or last author.

This result might have been biased by the length of the time window used to define new authors. We thus re-ran the analysis of result 3 of §1.9.3.5 for each alternative duration used to define a new author (i.e. 1, 3, 4, 5, 10 years and the entire-range of publication of the journal). In the worst case (i.e. use of the entire time range of publication of the journal to define a new author), the modulation by time of the association between the variation of the number of original articles of new first and last authors the year after (i.e. number of articles at year n+1 – number of articles at year n) and the variation of IF the year before (i.e. IF of year n – IF of year n-1) was still significant (p=0.05, additional figure 6B).

The result might also have been biased by the removal of homonyms. We re-ran the analysis of result 1 except that we did not consider as new authors the authors with more than 50 articles published in the same *Nature* journal. Results (the two bars of the right side of the

additional figure 6E) were consistent with the ones reported in the main text (the two bars of the left side of the additional figure 6E).

1.1.7. Analysis reported in §1.9.3.6

This set of results shows that the results of figure 3B of the article are robust with regards of:

- the method used to identify editor's co-authors,
- the method used to remove homonyms among authors,
- the threshold values used in the method used to remove homonyms among authors,
- the inclusion criteria of editors which are specific to this analysis.

As in §1.1.2, the results of this analysis may have been biased by the threshold used to remove homonyms (i.e. *average+5*SD*). We therefore re-ran the analysis of §1.9.3.6 (i.e. the linear mixed model) using the thresholds *average+3*SD*, *average+4*SD*, *average+6*SD* and *average+7*SD*. Note that the method used to remove homonyms was a fixed threshold. For each threshold value, the difference between editor's co-authors and the other authors in the increase in publications in the editor's journal was reduced after the setup of the non-financial COI policy (additional figure 2C, $p<0.03$). Additionally, among editors appointed after the setup of the non-financial COI policy, there was still a higher increase in publications of editor's co-authors after the editor's appointment as compared to the other authors (mean difference in the increase in the number of articles published between the other authors and the editor's co-authors (SEM): -0.13 articles (0.06), p=0.05 for *average+3*SD*; -0.15 articles (0.07), p=0.03 for *average+4*SD*; -0.17 articles (0.07), p=0.02 for *average+5*SD*; -0.16 articles (0.07), p=0.03 for *average+6*SD*; -0.15 articles (0.08), p=0.06 for *average+7*SD*). Note that there was only a trend for the threshold *average+7*SD* which may be the consequence of a lack of statistical power. The estimate of the mean difference with the threshold *average+7*SD* was in the range of the other estimates. The threshold *average+7*SD* includes also in the analysis authors with a higher number of articles published over the four years of interest (i.e. the two years before the editor's appointment and the two years after). This leads to an increase of the estimated standard deviation requiring thus a larger dataset.

These results may also have been biased by the method used to remove homonyms. We therefore re-ran the analysis using the algorithm of §1.6.6.2 instead of a fixed threshold. We set the threshold to *average+3*SD*, *average+4*SD*, *average+6*SD* and *average+7*SD*. Except for the threshold *average+3*SD* for which there was no difference between before and after the setup of the non-financial COI policy (p=0.88), the difference between editor's co-authors and the other authors in the increase in publications in the editor's journal was reduced after the setup of the non-financial COI policy (supplementary figures 5D and 6C, p<0.03). The lack of difference for the threshold *average+3*SD* may be related to a too restrictive filtering (see §1.1.2 and §1.1.3 for detailed explanations). Likewise for the fixed threshold, among editors appointed after the setup of the non-financial COI policy, there was still a higher increase in publications of editor's' co-authors after the editor's appointment as compared to the other authors (mean difference in the increase in the number of articles published between the other authors and editor's co-authors (SEM): -0.08 articles (0.05), p=0.06 for *average+4*SD*; -0.1 articles (0.05), p=0.05 for *average+5*SD*; -0.08 articles (0.06), p=0.14 for *average+6*SD*; -0.07 articles (0.06), p=0.24 for *average+7*SD*). Likewise for the fixed threshold, the trend of the threshold *average+4*SD* may be related to a lack of statistical power.

The computation of the number of articles published by editor's co-authors may also have been biased by editor's homonyms who would not have been discarded from the analyses by the algorithm of §1.6.6.1. We thus checked whether the differences between before and after the non-financial COI policy were also observed when co-authors of the editor were also filtered. Likewise in §1.1.2, we restricted co-authors to the ones of the first group identified with the algorithm of §1.6.6.1.

We re-ran the analysis of §1.9.3.6 (i.e. the linear mixed model) with the fixed threshold to identify homonyms among authors (see §1.6.6.2) and the algorithm of §1.6.6.2. As for the analysis with all co-authors, we checked the robustness of the results by using different threshold values: *average+3*SD*, *average+4*SD*, *average+5*SD*, *average+6*SD* and *average+7*SD*. The threshold *average+5*SD* used also in the analysis of figure 3B of the article led to consistent results between figure 3B of the article and additional figures 1E and 1F. When using the fixed threshold to identify homonyms among authors, the difference, between before and after the setup of the non-financial COI policy, in the reduction of the increase in the number of articles published by editor's former co-authors in the editor's journal as compared to the other authors remained for all the other thresholds values when

using a fixed threshold ($p \leq 0.05$) except for *average+7*SD* for which there was a trend (additional figure 2D, p=0.06). Additionally, among editors appointed after the setup of the non-financial COI policy, there was still a higher increase in publications of editor's co-authors after the editor's appointment as compared to the other authors (mean difference in the increase in the number of articles published between the other authors and editor's co-authors (SEM): -0.11 articles (0.07), p=0.1 for *average+3*SD*; -0.14 articles (0.07), p=0.05 for *average+4*SD*; -0.17 articles (0.08), p=0.03 for *average+5*SD*; -0.15 articles (0.08), p=0.06 for *average+6*SD*; -0.14 articles (0.08), p=0.09 for *average+7*SD*). Similar amplitudes of the estimates of the mean and SEM obtained with all thresholds and the first group of co-authors of the editor as compared to the ones obtained with all co-authors and the same thresholds suggest that the results with trends obtained with the first group of co-authors (i.e. for thresholds *average+3*SD*, *average+6*SD* and *average+7*SD*) are rather the consequence of a lack of statistical power than the consequence of an absence of difference.

When using the algorithm of §1.6.6.2 to identify homonyms among authors together with the first group of co-authors of the editor identified with the algorithm of §1.6.6.1, the aforementioned difference between before and after the setup of the non-financial conflict of interest policy was significant for all thresholds ($p<0.003$) except for *average+3*SD* (additional figure 2D, p=0.94). The lack of difference for the threshold *average+3*SD* may be related to a too restrictive filtering (see §1.1.2 and §1.1.3 for detailed explanations). Contrary to the fixed threshold, among editors appointed after the setup of the non-financial COI policy, the increase in publications of editor's co-authors after the editor's appointment was similar to the one of the other authors for all thresholds (mean difference in the increase in the number of articles published between the other authors and editor's co-authors (SEM): -0.077 articles (0.048), p=0.11 for *average+4*SD*; -0.075 articles (0.056), p=0.18 for *average+5*SD*; -0.059 articles (0.062), p=0.34 for *average+6*SD*; -0.048 articles (0.066), p=0.47 for *average+7*SD*). This lack of difference as compared to the other methods used to address homonyms among authors and co-authors of the editor cannot ground a general lack of difference: compared to the analysis including all co-authors of the editor, the first group of co-authors of the editor reduces the statistical power as well as the algorithm of §1.6.6.2 to remove homonyms as compared to a fixed threshold.

Adding all editors appointed before September 16th 2011 (n=7 editors added to the 37 included in the analysis of §1.9.3.6) in the analysis did not change the results. For all methods used to address homonyms among authors (i.e. the fixed threshold and the algorithm of

§1.6.6.2) and editor's co-authors (i.e. all co-authors and the first group of co-authors of the editor identified with the algorithm of §1.6.6.1), there was still a significant difference between before and after the setup of the non financial COI policy in the difference between editor's co-authors and the other authors in the increase in their publications after the editor's appointment (mean difference, between editors appointed after the non-financial COI policy and before, of the difference between the other authors and editor's co-authors in the increase in the number of articles published after the editor's appointment (SEM): -0.31 articles (0.13), p=0.02 for all co-authors with a fixed threshold to remove homonyms among authors of *average+5*SD*; -0.22 articles (0.09), p=0.02 for all co-authors with the algorithm of §1.6.6.2 to remove homonyms among authors with a threshold of *average+5*SD*; -0.23 articles (0.16), p=0.15 for the first group of co-authors with a fixed threshold to remove homonyms among authors of *average+5*SD*; -0.27 articles (0.12), p=0.02 for the first group of co-authors with the algorithm of §1.6.6.2 to remove homonyms among authors with a threshold of *average+5*SD*). A negative value means that the difference between editor's co-authors and the other authors decreased after the setup of the non-financial COI policy as compared to before. The lack of difference when using the first group of co-authors of the the editor and a fixed threshold to remove homonyms among authors is likely related to a lack of statistical power: the estimate of the mean is in the range of the estimates obtained with the other methods to address homonyms among co-authors and all authors. Additionally, a fixed threshold is a more liberal method to identify homonyms among authors than the algorithm of §1.6.6.2 for which the results were significant.

We therefore can consider that the difference, between before and after the setup of the non-financial COI policy, in variations of publications by editors' co-authors in the editor's journal and the other *Nature* journals was robust with regards of homonyms.

However, this difference may be related to the characteristics of editors before and after the setup of the non-financial COI policy. Among editors included in this analysis, those appointed after the setup of the non-financial COI policy had an experience in academic research similar to the experience of those appointed before (mean time spent in academic research including the doctorate (SD): 9.3 years (3.6 years) vs 10.3 years (4.4 years) respectively, p=0.43). It was the same for the number of original research articles published as first or last author (mean (SD): 2.94 articles (2.49) vs 4 articles (3.25) respectively, p=0.22).

Combined with results of §2.2.4 of the supplementary materials related to the recruitment policy of *Nature* journals, these results suggest that the recruitment of editors was similar before and after the setup of the non-financial COI policy.

The number of editors included in this analysis is substantially lower than the 190 editors included in the other analyses (figure 1B of the article). The rationale is that we could include only editors for whom at least one co-author published at least one article during the two years before the editor's appointment or the two years after. We tested whether there was a difference in editors' characteristics between editors included in the analyses and the ones excluded because they had no co-author who published at least an article in *Nature* journals during the two years before or after the editor's appointment. Editors included in the analysis had a longer experience in research than those excluded from the analysis (mean time spent in academic research including the doctorate (SD): 9.4 years (3.7 years) vs 8.1 years (4.1 years) respectively, p=0.03). Consistently, editors included in the analysis published a higher number of articles as first or last author than editors excluded from the analyses (mean (SD): 3.14 articles (2.66) vs 1.68 articles (3.85) respectively, p=0.006). This difference may explain why editors were excluded. Editors with a shorter experience in research have less opportunity to publish. Editors with fewer articles published have potentially fewer co-authors. Thus they have lower chances than the other editors to have a co-author who published in the editor's journal during the two years before the editor's appointment or the two years after. However, this difference has little chance to account for our results reported in figure 3B of the article. The number of articles published by editors during their academic research career was not associated with the difference in increase of the number of articles published by co-authors after the editor's appointment as compared to before (see §2.1.3 and §2.1.4 of the supplementary materials).

We showed that the editor's research experience was associated with the difference, between editors' former co-authors and the other authors, in the increase in publications in the editor's journal after the editors' appointment (see §2.1.3 of the supplementary materials). The editor's research experience may contribute to the results reported in figure 3B of the article. We therefore reran the linear model reported in §1.9.7 modified to adjust the results of figure 3B of the article over the editors' research experience. We added the editor's experience as a regressor in the model with up to the three-way interaction with the regressors of the type of authors (editor's co-authors /other authors) and the type of period (before/after the editor's appointment). We ran this analysis with all co-authors of the editor and a fixed threshold of

*average+5*SD* to remove homonyms among authors. A longer experience in research of the editor tended to be associated with a higher change in the pattern reported in figure 3B of the article (beta (SEM): -0.056 articles/year of research experience (0.032), p=0.08). A similar result was obtained with the algorithm of §1.6.6.2 and a threshold of *average+5*SD* to remove homonyms among authors (beta (SEM): -0.043 articles/year of research experience (0.024), p=0.07). Thus, the editor's research experience likely has a limited contribution to the results observed in figure 3B of the article.

1.1.8. Analysis reported in §1.9.3.7

The results of this analysis reported in figure 3C of the article may have been biased by the threshold used to remove homonyms (i.e. *average+3*SD*). We therefore re-ran the analysis of §1.9.3.6 using the thresholds *average+SD*, *average+2*SD*, *average+4*SD* and *average+5*SD*. For each threshold value, the pattern of the increase in publications by editors' former co-authors in the editor's journal and in the other *Nature* journals remained similar. In the editor's journal, after the editor's appointment as compared to before, there was an increase in the number of publications by authors affiliated with one of the editor's former affiliations both for editors appointed before and after the setup of the non-financial COI policy (additional figure 1E, $p \leq 0.04$). It was the same for the average number of articles published in the other *Nature* journals (additional figure 1E, $p \leq 0.03$). For the thresholds *average+3*SD*, *average+4*SD* and *average+5*SD*, there was a difference between the editor' journal and the other journals before the setup of the non-financial COI policy (additional figure 1E, $p \leq 0.05$) and a trend for the threshold *average+2*SD* (additional figure 1E, p=0.08). However, after the setup of the non-financial COI policy, there was a difference between the editor's journal and the other journals only for the threshold *average+2*SD* (additional figure 1E, p=0.03) and a trend for the thresholds *average+3*SD*, *average+4*SD* and *average+5*SD* (additional figure 1E, p=0.07). The difference between editor's journal and the other journals was similar before and after the setup of the non-financial COI policy for thresholds *average+SD*, *average+2*SD* and *average+3*SD* (additional figure 1E, $p > 0.22$). There was a trend for a difference between the two periods for the two other thresholds (additional figure 1E, p=0.06).

Including editors who have been appointed before did not change the results. The difference between editor's journal and the other journals was similar before and after the setup of the non-financial COI policy for all thresholds (additional figure 1F, $p>0.32$).

1.2. Robustness of additional results reported in §2.2 of the supplementary materials of the article

1.2.1. The launch of a new Nature journal is not associated with a higher number of publication by new authors

This result was reported in §2.2.3 of the supplementary materials. It may have been biased by the duration of the time window used to define new authors. We thus re-ran the analysis of §1.11.2 of the second set of results reported in the main text (see the statistical models section) for each alternative duration used to define a new author (i.e. 1, 3, 4, 5, 10 years and the entire-range of publication of the journal). Additional figure 5A showed that the slope and the intercept stayed of the same order of magnitude as the one of §2.2.3 of the supplementary materials and that, in the worst case (i.e. use of five years to define a new author), the slope was still significant ($p=0.03$).

The result may also have been biased by the removal of homonyms. We re-ran the analysis of §1.11.2 except that we did not consider as new authors the authors with more than 50 articles published in the same *Nature* journal. Results were consistent with the ones reported in §2.2.3 of the supplementary materials (slope (SEM): -3.51 (1.26), $p=0.01$; intercept (SEM): -24.2 (16.8), $p=0.16$, additional figure 5B).

1.2.2. The current recruitment policy of editors at Nature journals contributes to increase rather than decrease the differences between authors with different reputation to the editors

The goal of this robustness analysis was to check whether the selection of the 190 editors (as compared to the 306 available editors (figure 1B of the article)) may have biased the result of the logistic regression reported in §1.11.5. We could not assess directly the robustness of the results of this logistic regression: this regression included the number of original articles

published by the editors before joining *Nature* journals and the 116 excluded editors had homonyms which biased the computation of this number. However, the time spent in academic research by these 116 editors and the duration of their editorial experience in *Nature* journals were not biased. We therefore compared, using a Student t-test, the average duration of the editorial board's research experience (i.e. same value as the one used in the logistic regression of §1.11.5) for the boards which issued job offers which explicitly stated that "a postdoc experience was preferred" or "a strong research record was preferred" to those which issued job offers not mentioning any of these two statements. We ran this t-test with the 190 editors included in the analyses reported in the main text and with the 306 editors available. If the results of the two tests were significant, results were considered robust.

We did the same with the duration of the editorial experience. For the number of original articles published by editors before joining *Nature* journals, we used only the 190 editors but for the first t-test, we used all co-authors of the editor while in the second one, we used only the co-authors of the first group of editor's co-authors identified with the algorithm of §1.6.6.1.

When considering the 306 editors, job offers which explicitly stated that "a postdoc experience was preferred" or "a strong research record was preferred" were issued by editors of boards with the longest experience in research (the two bars on the right of supplementary figure 3A) and with the shortest experience as editor (the two bars on the right of supplementary figure 3B) reproducing the results obtained with the 190 editors (the two bars on the left of supplementary figures 3A and 3B).

When considering only the first group of editor's co-authors and the fixed threshold to remove homonyms, former co-authors of editors still published on average more articles in the editor's journal during the two years before the editor's appointment than the other authors (mean (SEM): 0.79 article (0.06) vs 0.56 article (0.02) respectively, $p<0.0001$). The result was similar when using the algorithm of §1.6.6.2 to remove homonyms (mean (SEM): 0.66 article (0.05) vs 0.53 article (0.02) respectively, $p=0.01$). Similar results were obtained when considering all co-authors of the editor and using the algorithm of §1.6.6.2 to remove homonyms (mean (SEM): 0.66 article (0.05) vs 0.53 article (0.02), $p=0.001$). Results were also similar when the value used to identify homonyms was set to *average+3*SD*, *average+*4*SD*, *average+6*SD* and *average+7*SD* for both the algorithm and the fixed threshold (additional figures 3E and 3F).

Overall, results reported in §2.2.4 of the supplementary materials may be considered as robust.

1.3. Control analyses

1.3.1. Analysis 1

While the variability from year to year in the total number of articles published in *Nature* every year and referenced in PubMed was similar over the period 1945-1989 and over the period 1990-2020 (average distance to the mean (i.e. for each year of a given period, distance to the mean=abs(number of articles over that year-mean of annual number of articles over all years of the period) with abs() the absolute value), over each period, of the total number of articles published each year (SD): 446 articles (351) for the period 1945-1989 vs 457 articles (237) for the period 1990-2020, p=0.88), this variability was substantially higher for the proportion of original articles published over the period 1945-1989 than over the period 1990-2020 (average distance to the mean (i.e. for each year of a given period , distance to the mean=abs(% of original articles over that year-mean of annual % of original articles over all years of the period) with abs() the absolute value), over each period, of the percentage of original articles published each year (SD): 15.9% (13.9) for the period 1945-1989 vs 3% (1.7) for the period 1990-2020, p<0.00001). Additionally, the variations in this rate were stable across years over the period 1990-2020 (p=0.14) while it was not the case over the period 1945-1989 (p=0.001). These results suggested that the labeling or the referencing of original articles in PubMed before 1990 was not as stable as after 1990 justifying thus the restriction of our analyses focusing on articles published in *Nature* journals to the period 1990-2020.

1.3.2. Analysis 2

When considering all articles published in *Nature* journals (i.e. original articles and the other articles), the Bland and Altman analysis showed that the intercept was negative (intercept (SEM): -1.97 (0.012), p<0.0001) and that the slope was negative (slope (SEM): -0.00045 (0.00021), p=0.03). Therefore the observed rate of articles with authors' names sorted by alphabetical order was systematically lower than the rate of having by chance articles with authors' names sorted by alphabetical order.

A very similar result was obtained for original articles (intercept (SEM): -1.97 (0.013), p<0.0001; slope (SEM): -0.00048 (0.00022), p=0.03).

Taken all together, the ranking of authorship in articles published in *Nature* journals followed a rule justifying the use, in our main analyses, of the distinction of first author, last author and intermediate authors according to the standard rule of a ranking of authors by decreasing order of contribution except for the last author who has supervised the work [24].

1.3.3. Analysis 3

The duration for application to the job offers included in the analyses was longer than the duration between two consecutive data collection points (mean (SD): 22.6 days (5.5) vs 17.3 (6.2), p=0.0003). Additionally, the number of job offers for editorial positions handling manuscripts which have been released by *Nature* journals between December 2020 and December 2021 was estimated to be 84.7. The data collection may thus have missed less than 7 job offers representing 8.6% of the analyzed job offers. Therefore, the fifth set of results reported in the main text is very unlikely to have been biased by missing data.

1.4.Robustness of results mentioned only in the supplementary materials of the article

1.4.1. Relationship between the rate of original articles of new first and last authors and subsequent IF

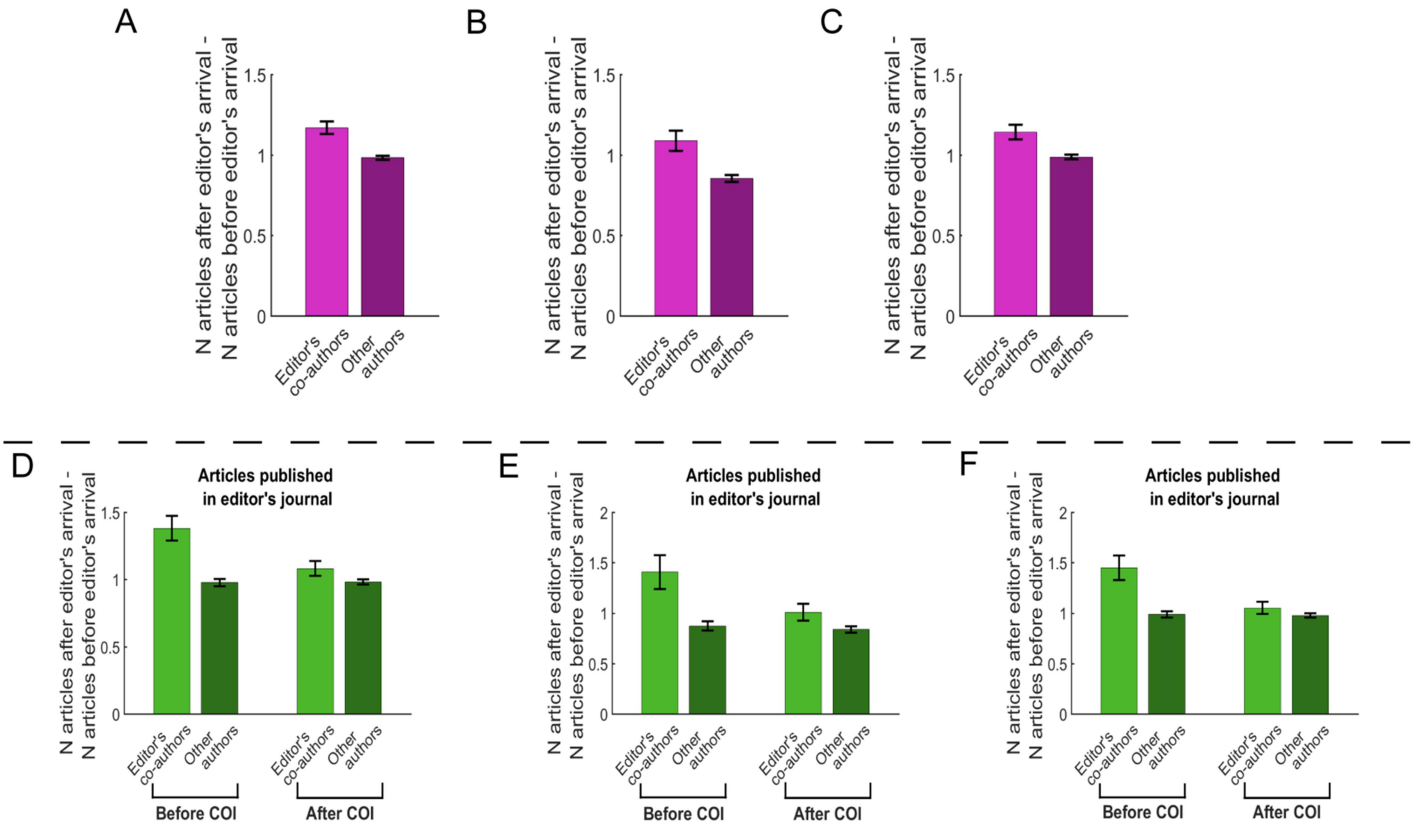
This result might have been biased by the duration of the time window used to define new authors. We thus re-ran the analysis of §1.11.3 for each alternative duration used to define a new author (i.e. 1, 3, 4, 5, 10 years and the entire-range of publication of the journal). Supplementary figure 10A showed that the association between IF at year n and the rate of original articles by new first and last authors at year n-2 was significant for all durations (p<0.00001) used to define a new author and for both types of journals (i.e. generalists and specialized). The difference between the two types of journals was significant except for a duration of 3 years for which there was a trend (p=0.07).

The result might also have been biased by the removal of homonyms. We re-ran the analysis of §1.11.3 except that we did not consider as new authors the authors with more than 50 articles published in the same *Nature* journal. Results were consistent with the ones reported

in the main text (additional figure 6C, slope (SEM): -0.54 (0.12), $p<0.00001$ (red); -0.28 (0.04), $p<0.00001$ (blue)).

2. Additional figures

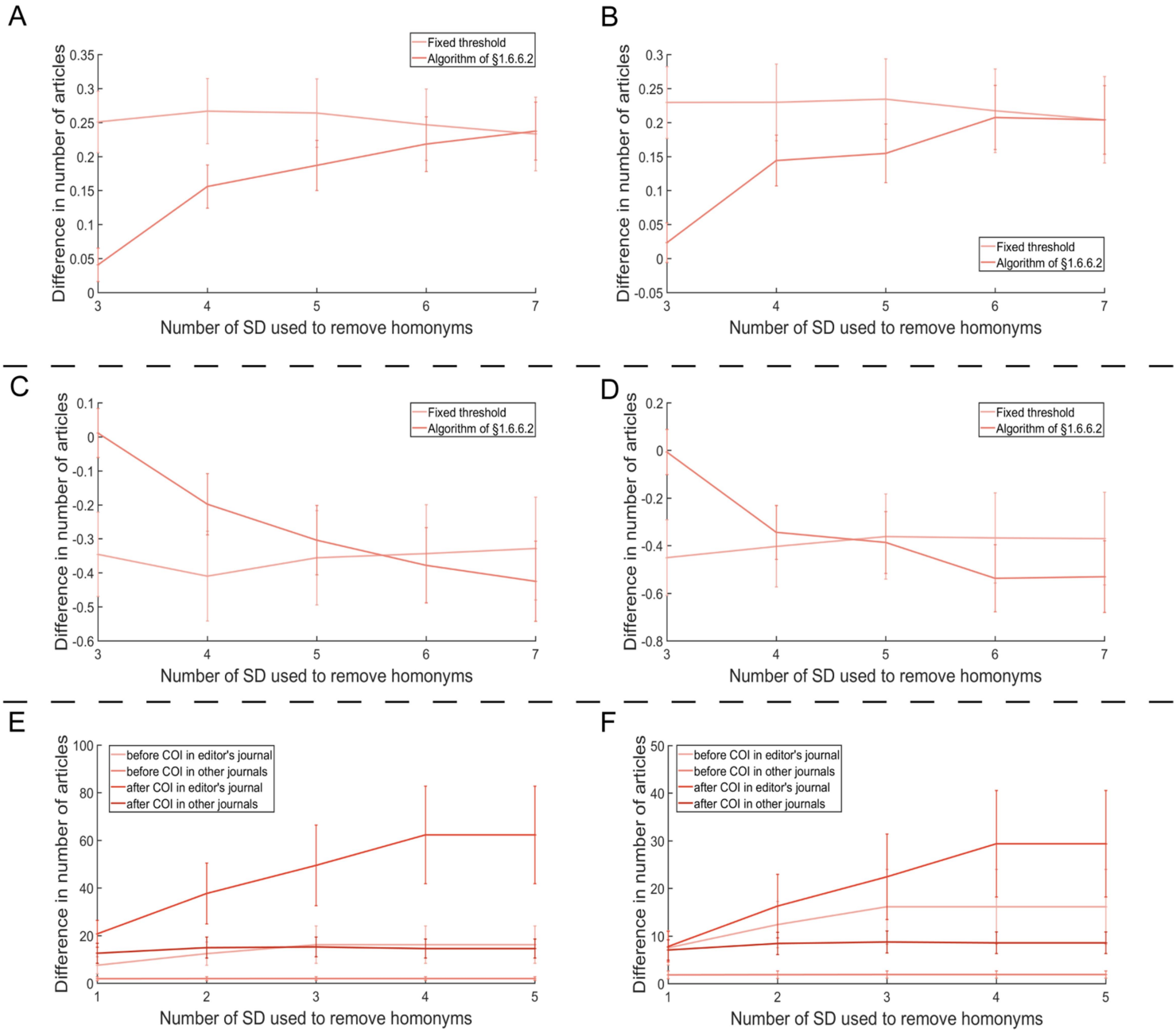
2.1.Additional figure 1



Additional figure 1: Figure 2A of the article when considering all co-authors of the editor and using the algorithm of §1.6.6.2 to identify homonyms among authors with a threshold of *average+5*SD* (A); Figure 2A of the article when considering the first group of co-authors of the editor identified with the algorithm of §1.6.6.1 (the remaining co-authors of the editor are considered as other authors in the same way as authors without any tie with the editor) and using a fixed threshold to identify homonyms among authors with a threshold of *average+5*SD* (B); Figure 2A of the article when considering the first group of co-authors of the editor identified with the algorithm of §1.6.6.1 (the remaining co-authors of the editor are considered as other authors in the same way as authors without any tie with the editor) and using the algorithm of §1.6.6.2 to identify homonyms among authors with a threshold of *average+5*SD* (C); Figure 3B of the article when considering all co-authors of the editor and using the algorithm of §1.6.6.2 to identify homonyms among authors with a threshold of *average+5*SD* (D); Figure 3B of the article when considering the first group of co-authors of the editor identified with the algorithm of §1.6.6.1 (the remaining co-authors of the editor are considered as other authors in the same way as authors without any tie with the editor) and

using a fixed threshold to identify homonyms among authors with a threshold of *average+5*SD* (E); Figure 3B of the article when considering the first group of co-authors of the editor identified with the algorithm of §1.6.6.1 (the remaining co-authors of the editor are considered as other authors in the same way as authors without any tie with the editor) and using the algorithm of §1.6.6.2 to identify homonyms among authors with a threshold of *average+5*SD* (F). No p-value is reported on these figures.

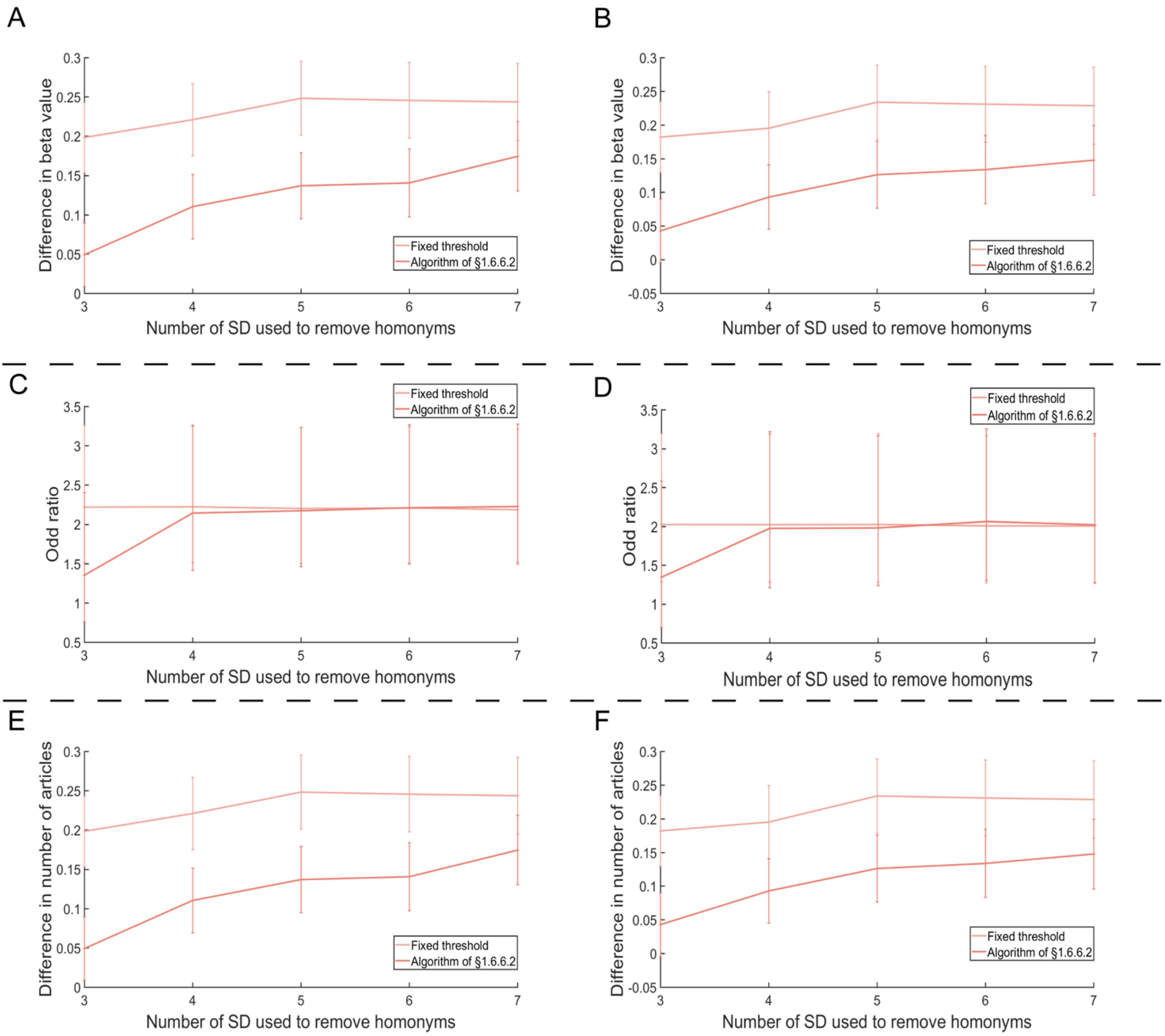
2.2.Additional figure 2



Additional figure 2: Difference ($N_{\text{articles of }}$**editor's co-authors after** editor's appointment$-N_{\text{articles of }}$**editor's co-authors before** editor's appointment)$-$ ($N_{\text{articles of the }}$**other authors after** editor's appointment$-N_{\text{articles of the }}$**other authors before** editor's appointment) as a function of the threshold used to identify homonyms and the type of method associated to this threshold (i.e. the fixed threshold or the algorithm of §1.6.6.2) when considering all co-authors of the editor (A); Same as additional figure 2A except that we considered the first group of co-authors of the editor identified with the algorithm of §1.6.6.1

(the remaining co-authors of the editor are considered as other authors in the same way as authors without any tie with the editor) instead of all co-authors (B); Difference, between after and before the setup of the non-financial conflict of interest policy at *Nature* journals, of the difference computed in additional figure 2A as a function of the threshold used to identify homonyms and the type of method associated with this threshold (i.e. the fixed threshold or the algorithm of §1.6.6.2) when considering all co-authors of the editor (C); Same as supplementary figure 2C except that we considered the first group of co-authors of the editor identified with the algorithm of §1.6.6.1 (the remaining co-authors of the editor are considered as other authors in the same way as authors without any tie with the editor) instead of all co-authors (D); Difference between after and before the editor's appointment in the total number of articles published by authors affiliated with one of the editor's former research affiliations as a function of the threshold used to address outliers in this number, the type of journal (i.e. editor's journal/the other *Nature* journals) and the period of interest (i.e. before/after the setup of the non-financial conflict of interest policy at *Nature* journals, E); Same as additional figure 2E except that all editors appointed before September 16th 2011 are included in the study (see §1.9.3.6 and §1.9.3.7, F). No p-value is reported on these figures. In additional figure 2A, compared to the other authors, a positive value means that there is a larger increase in the number of articles published in the editor's journal by editor's co-authors after the editor's appointment as compared to before. This figure is the result of the robustness analysis associated with figure 2A of the article and additional figures 1A to 1C. The same consideration applies to additional figure 2B. In additional figure 2C, compared to the other authors, a negative value means that there is a larger reduction in the number of articles published in the editor's journal by editor's co-authors after the setup of the non-financial COI policy at *Nature* journals as compared to before. This figure is the result of the robustness analysis associated with figure 2A of the article and additional figures 1A to 1C. The same consideration applies to additional figure 2B. In additional figures 2E and 2F, a positive value means that there is an increase in the number of articles published by authors affiliated with one of the editor's former research institutions after the editor's appointment as compared to before.

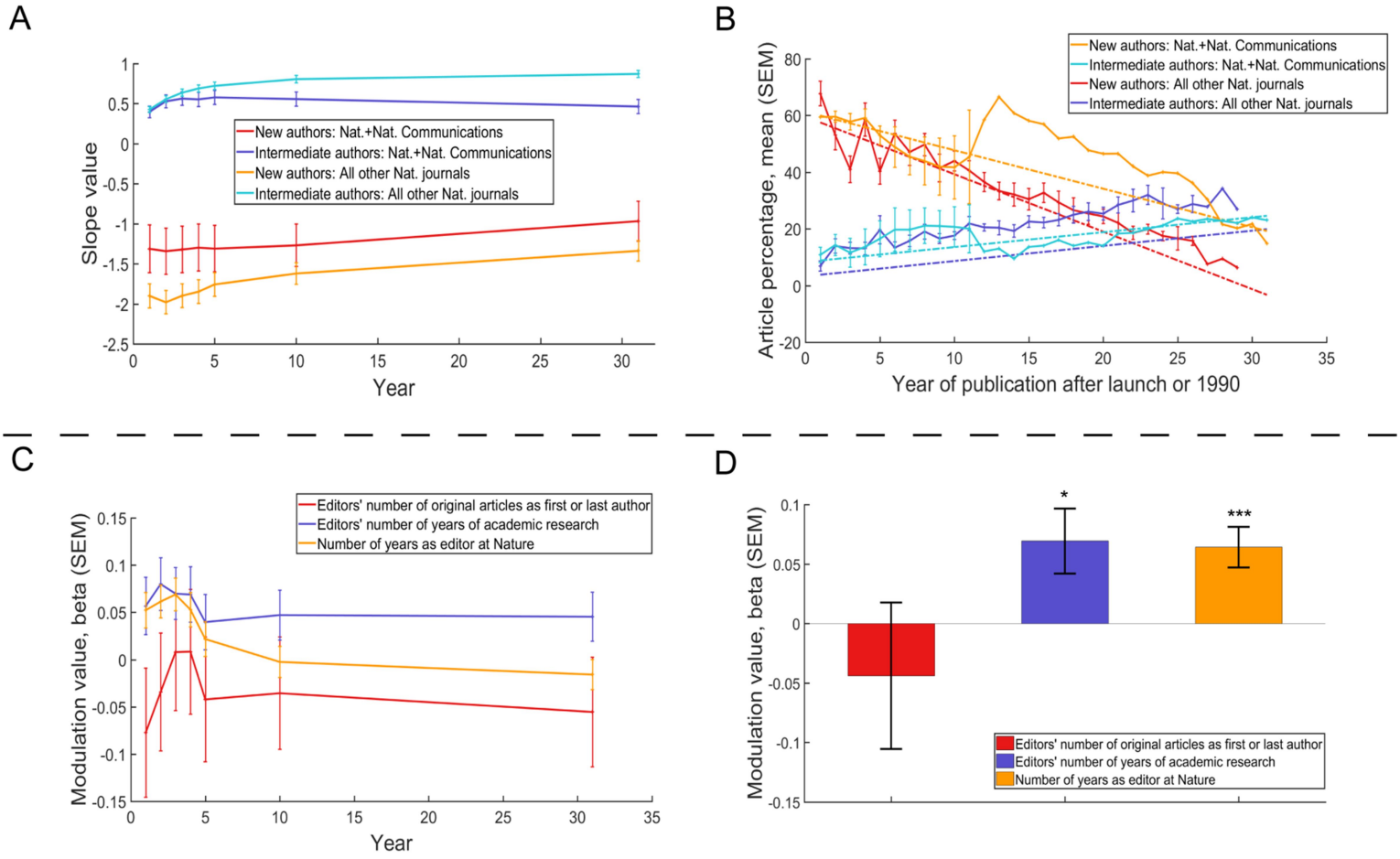
2.3.Additional figure 3



Additional figure 3: Difference between editor's co-authors and the other authors in the association between editor's scientific experience and the increase in publications of these authors in the editor's journal after the editor's appointment as a function of the threshold used to remove homonyms among authors and the method used to remove homonyms (i.e. a fixed threshold or the algorithm of §1.6.6.2) when considering all co-authors of the editor in the analysis (A); Same as supplementary figure 3A except that co-authors are restricted to the ones of the first group of co-authors of the editor identified with the algorithm of §1.6.6.1 (B); Odds ratio of the increase in probability of editor's co-authors to publish in the editor's

journal after the editor's appointment as compared to the other authors among authors with the same publishing record as a function of the threshold used to remove homonyms among authors and the method used to remove homonyms (i.e. a fixed threshold or the algorithm of §1.6.6.2) when considering all co-authors of the editor in the analysis (C); Same as supplementary figure 3C except that co-authors are restricted to the ones of the first group of co-authors of the editor identified with the algorithm of §1.6.6.1 (D); Difference between editor's co-authors and the other authors in the number of articles published in the editor's journal before the editor's appointment (E); Same as additional figure 3E except that co-authors are restricted to the ones of the first group of co-authors of the editor identified with the algorithm of §1.6.6.1 (F).

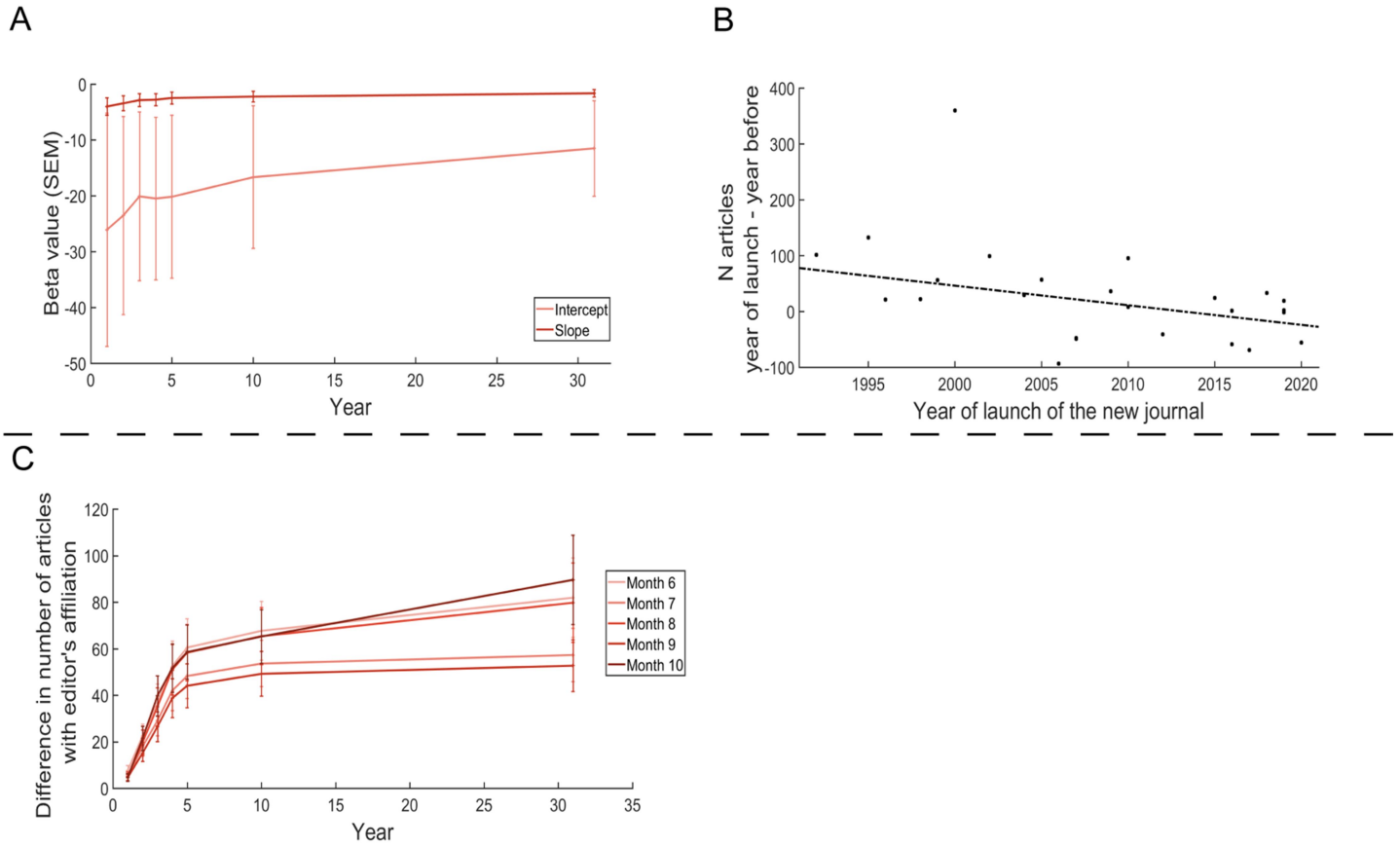
2.4.Additional figure 4



Additional figure 4: slopes of figure 2C of the article as a function of the duration (in years) used to define a new author (A); figure 2C of the article plotted when considering as potential known authors those whose name was mentioned in the authorship of more than 50 articles in the same *Nature* journal (B); modulation values of figure 2B of the article as a function of the duration (in years) used to define a new author (C); figure 2B of the article plotted when considering as potential known authors those whose name was mentioned in the authorship of more than 50 articles in the same *Nature* journal (D).

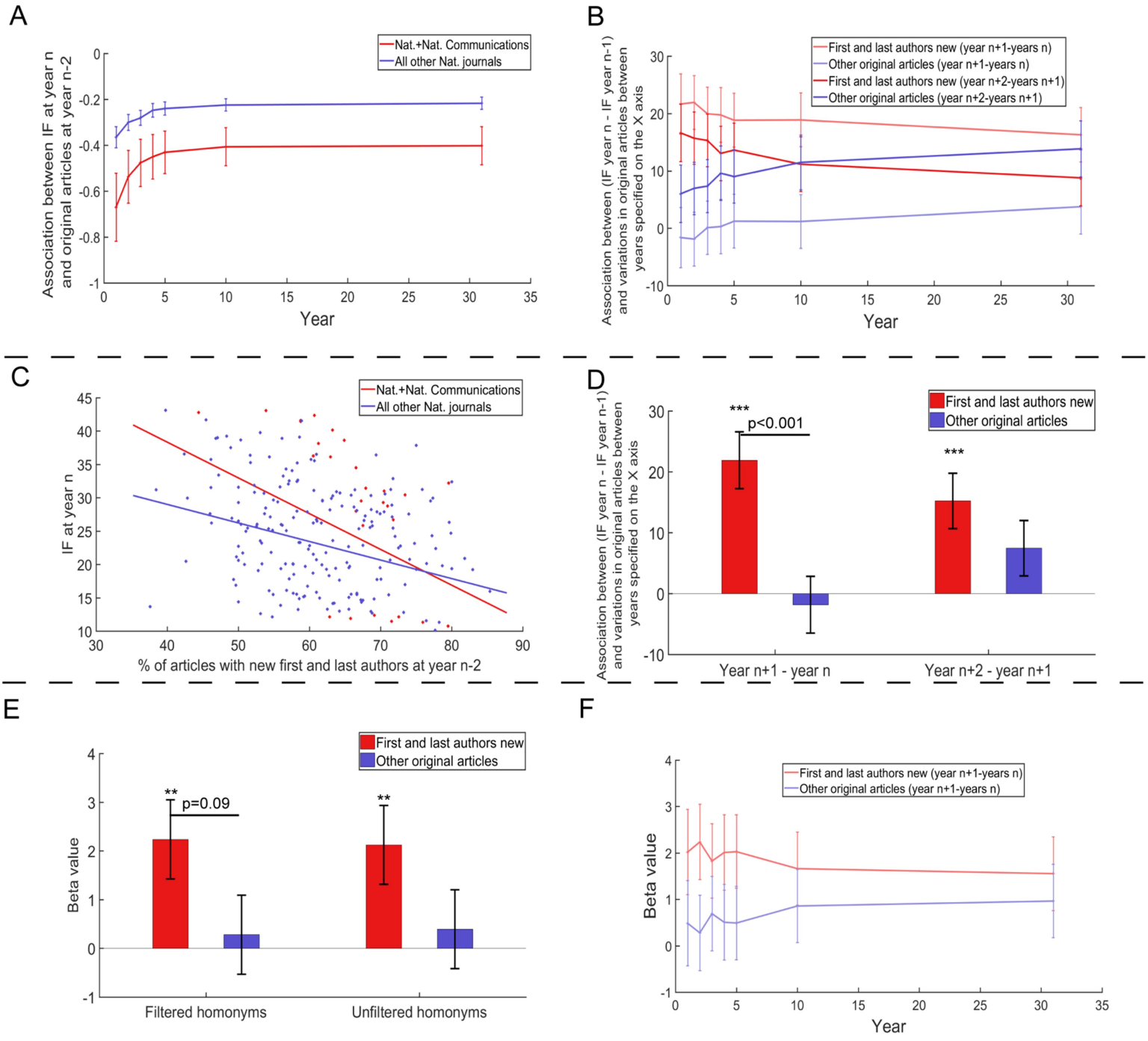
**: p<0.05; **: p<0.01; ***: p<0.001. These p-values are for comparisons of bars against zero (paired t-test). Data were truncated to January 1st 1990 for Nature.*

2.5.Additional figure 5



Additional figure 5: slope and intercept of supplementary figure 2C as a function of the duration (in years) used to define a new author (A); Supplementary figure 2C plotted when considering as potential known authors those whose name was mentioned in the authorship of more than 50 articles in the same *Nature* journal (B); Difference between the difference between the two left bars of supplementary figure 2A as a function of the duration in years of the time windows before and after the editor's recruitment and of the duration in months (i.e. 6, 7, 8, 9 or 10) of the publication process (C).

2.6. Additional figure 6



Additional figure 6: Linear association (i.e. beta) between the rate of original articles published by first and last authors new (red) at year n-2 and the impact factor (IF) at year n in *Nature* and *Nature Communications* as a function of the duration (in years) used to define a new author (A, the blue line is for the other *Nature* journals); Linear association (i.e. beta) between $N_{\text{original articles year n+1}}$- $N_{\text{original articles year n}}$ (respectively $N_{\text{original articles year n+2}}$- $N_{\text{original articles year n+1}}$ for the dark red and dark blue curves) and $IF_{\text{year n}}$-$IF_{\text{year n-1}}$ in *Nature* and *Nature*

Communications as a function of the duration (in years) used to define a new author (B); supplementary figure 2E plotted when considering as potential known authors those whose name was mentioned in the authorship of more than 50 articles in the same *Nature* journal (C); figure 3A of the article plotted when considering as potential known authors those whose name was mentioned in the authorship of more than 50 articles in the same *Nature* journal (D); Modulation by the year n of the association between $N_{\text{original articles year n+1}}$- $N_{\text{original articles year n}}$ and $IF_{\text{year n}}$-$IF_{\text{year n-1}}$ in *Nature* and *Nature Communications* for articles with new first and last authors (light and dark red) and for articles of a known first or last author (light and dark blue) when considering as new authors, the authors whose name was mentioned in the authorship of more than 50 articles in the same *Nature* journal (two left bars) and when considering as potential known authors those whose name was mentioned in the authorship of more than 50 articles in the same *Nature* journal (two right bars, E); Modulation by the year n of the association between $N_{\text{original articles year n+1}}$- $N_{\text{original articles year n}}$ and $IF_{\text{year n}}$-$IF_{\text{year n-1}}$ in *Nature* and *Nature Communications* reported in the two left bars of supplementary figure 10E as a function of the duration (in years) used to define a new author (F).

**: p<0.05; **: p<0.01; ***: p<0.001. These p-values are for comparisons of bars against zero (paired t-test).*

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