“Involving Ukrainian early career scientists in publishing practices and their attitudes to scholarly communication”

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INVOLVING UKRAINIAN EARLY CAREER SCIENTISTS IN PUBLISHING PRACTICES AND THEIR ATTITUDES TO SCHOLARLY COMMUNICATION

Abstract

This paper highlights the authorship, co-authorship, and peer review experience of Ukrainian early career scientists to see their attitudes to scholarly communication. A questionnaire was distributed through Facebook groups and university networks all over Ukraine. Results from 630 respondents demonstrated contradictory tendencies of Ukrainian early scientists' publication activity. Most respondents try to gain recognition, adhere to high standards, and improve their writing skills. Meanwhile, there is a problem of low motivation, violations of academic integrity, detachment from the international scientific community, etc. 5.6% of respondents admitted that they wrote articles where they substituted the results without conducting experiments, deliberately distorted the results of research, and forged experimental data. Above a half of the respondents (52.9%) have experience of reviewing and consider it to improve their authorship skills, engage in scientific dialogue, cope with new methods and theories, etc. But 95.0% of reviewers had problems, for example obviously poor-quality articles for review (47.5%), a request for a review when the article does not match the reviewer's qualifications (32.5%), no access to data to check dubious results (15.0%), lack of instructions for reviewers (10.0%), ignoring significant remarks by authors (7.5%). The survey showed a significant predominance of co-authored articles. Among the main motives for publishing co-authored articles, respondents highlighted the following: saving time, intellectual development, co-payment of publications, access to expensive equipment, the chance of being quoted, and cooperation.

Keywords early career scientists, scholarly communication, authorship, co-authorship, peer review

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INTRODUCTION

Publishing activity is one of the main sources of scientists' "academic capital". In the context of competition for scientific positions and grants, it has become a key indicator of the productivity and potential of each scientist. Starting a scientific career, a researcher joins the system of scientific communication as an author and interacts with other authors, reviewers, editors, grantors, etc. Participating in the publishing process, he or she identifies own motives for publishing scientific results, creates an appropriate reputation, and can gain other roles such as a reviewer or an editorial board member. The system of professional communication, in which the early career scientist is involved, sets the conditions (principles) of communicative behavior. In the publishing activity, these limits of his or her communicative interaction manifest in attitudes to:

1) scientific knowledge (reliability of published data, attitude to plagiarism);

2) each other (communication with co-authors, editors, reviewers, establishing professional contacts);

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3) society (social responsibility);

4) himself or herself (choice of journals for publication of scientific results, gaining reputation), etc.

Given this, there is a need to investigate the involvement of early career scientists in authorship, co-authorship, and peer review practices, and their science communication attitudes.

1. LITERATURE REVIEW

There are plenty of studies on authorship, co-authorship, reviewing, and related ethical aspects of scholarly communication. Olesen et al. (2018) revealed different types of unethical authorship (gift, guest or honorary authorship, mutual support authorship, coercion authorship, denial of authorship) and concluded that the culture of 'publish or perish', when researcher's career is extremely dependent upon the quantity rather than the quality of papers, could be the main way to unethical authorship. They also highlighted the importance of an institution's responsibility to educate scientists to maintain integrity and accountability of their papers.

Bozeman and Youtie (2016) focused on problems in co-authorship crediting, identifying problems, and creating a model of co-author crediting determinants. They found that such crediting problems are excluding deserving or including undeserving contributors. Hu et al. (2014) concluded that at different career stages co-authorship is different in scale and scope. Co-authorship for early career scientists is only weakly associated with productivity. Figg et al. (2006) highlighted those researchers who are open to co-authorship produce better results that lead to a higher impact. Henriksen (2018) showed that publications with empirical results, quantitative research, and/or survey are more likely to have more co-authors than papers based on theoretical data, interviews, and qualitative research. McNutt et al. (2018) recommended editors adopt common and transparent standards for authorship, outline responsibilities for corresponding authors, use the Contributor Roles Taxonomy, and add this information to article metadata.

Tennant (2018) described the role of peer review in a modern digital research and communications infrastructure. Vesper (2018) highlighted that peer review allows the researchers to read the paper before it gets published, provides an opportunity to create a good reputation and find possible co-authors. Haffar et al. (2019) conducted a narrative critical review and evaluated peer review biases, considering an important effect of peer review on academic integrity. Their results show that peer reviewers can ask authors to delete some results, change analyses, perform post hoc subgroup analyses, and do other actions that can lead to biases. Fox (2017) found that papers for which editors had more difficulty recruiting reviewers were scored as lower quality and/or less important papers by reviewers and were more likely to be rejected by journals after review, compared to articles for which reviewers were easily recruited.

Walker and Rocha da Silva (2015) identified two major trends: the expanding role of preprint servers that dispense with traditional peer review altogether, and the growth of "non-selective review", focusing on papers' scientific quality rather than their importance and novelty. It has been also found that early career scientists consider publishing and peer review a complex process, and they learn by involving in these processes (Jamali et al., 2020; Mason & Merga, 2018).

This study aims to investigate:

1) Ukrainian early career scientists' involvement in authorship and co-authorship practices;

2) involvement in the peer reviewing process;

3) their science communication attitudes.

2. METHODS

A questionnaire survey was developed and distributed online and made available in February–August 2021 on the pages of Facebook groups "Ukrainian Scientific Journals", "Ukrainian Scientists

Worldwide", "Pseudoscience News in Ukraine", "Scientific Conferences and Publications", "Academic Virtue and Plagiarism", "Higher School and Science of Ukraine: Disintegration or Blossoming?", and through university networks all over the country. The survey was piloted on the Printing and Publishing Institute of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" before launch (20 early career scientists). The results of the survey were analyzed during September–October 2021.

Overall, 630 early career scientists completed the questionnaire. 5% of the respondents were 20 years old or younger, 19.5% were 20-25 years old, 30.1% – 26-30 years old, 33.9% – 31-35 years old. Doctors of Sciences and doctoral students under the age of 40 also belong to the group of early career scientists and could have taken part in the survey. Thus, 11.5% of the respondents were 36–40 years old. From the total number of respondents, 40.0% were male, 58.6% were female, and the rest did not answer this question (1.4%).

60.0% of respondents were PhDs, 12.9% – Doctors of Sciences, 24.3% – researchers without scientific degree, and the rest were students (2.8%). The questionnaire was filled by the representatives of 17 scientific fields: biology (10.5%), medicine (8.8%), jurisprudence (8.6%), chemistry (8.4%), physics and mathematics (8.3%), engineering (7.4%), philology (7.1%), economics (6.9%), history (6.6%), IT (5.7%), pedagogy (4.3%), philosophy (4.1%), geography (4.1%), social communication (3.3%), agricultural sciences (2.9%), ecology (1.6%), and geology (1.4%).

3. RESULTS

3.1. Authorship

The survey showed that 54.3% of respondents have more than 10 articles in Ukrainian professional scientific journals, not indexed by Web of Science and (or) Scopus. 13.1% of respondents have 6–10 articles, 12.7% – 2 or 3, 8.6% – 1, 7.1% – none, 4.2% – 4–5. Meanwhile, 15.7% of respondents have 1 article in Ukrainian scientific journals indexed by Web of Science and (or) Scopus, 15.4% – 2 or 3, 11.7% – 4 or 5, 7.1% – more than 10, 4.3% – 6–10. 45.8% of the respondents do not have such papers being published (Figures 1 and 2).

Regarding scientific articles in foreign scientific journals indexed by Web of Science and (or) Scopus, 21.4% of respondents have 2–3 such publications, 17.1% – more than 10, 11.6% – 4–5, 11.4% – 1, 7.1% – from 6 to 10. 31.4% of early career scientists do not have any such articles. There are articles primarily of researchers from such fields as mathematics, theoretical physics, engineering, biology, chemistry, and ecology in the international journals indexed by Web of Science and (or) Scopus. Present interdisciplinary and highly specialized scientific results (mathematical biosciences and engineering, electrochemistry, microbiology, neuroscience, neuroinflammation, forest research, etc.) are also covered by these journals.

32.9% of the respondents stated that they do not have any articles neither in Ukrainian nor in foreign journals indexed in Web of Science and (or) Scopus. Among the reasons for this, they named

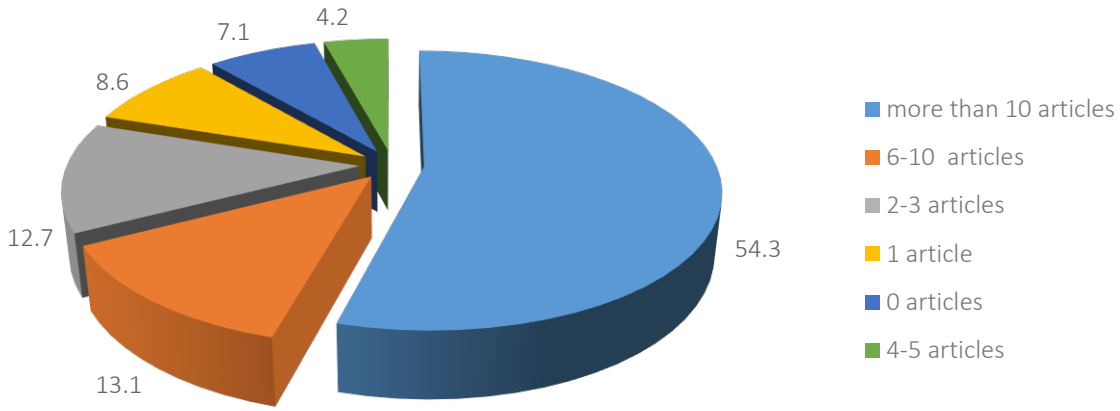

Figure 1. Percentage of scientists who have articles in Ukrainian scientific journals not indexed by Web of Science and (or) Scopus

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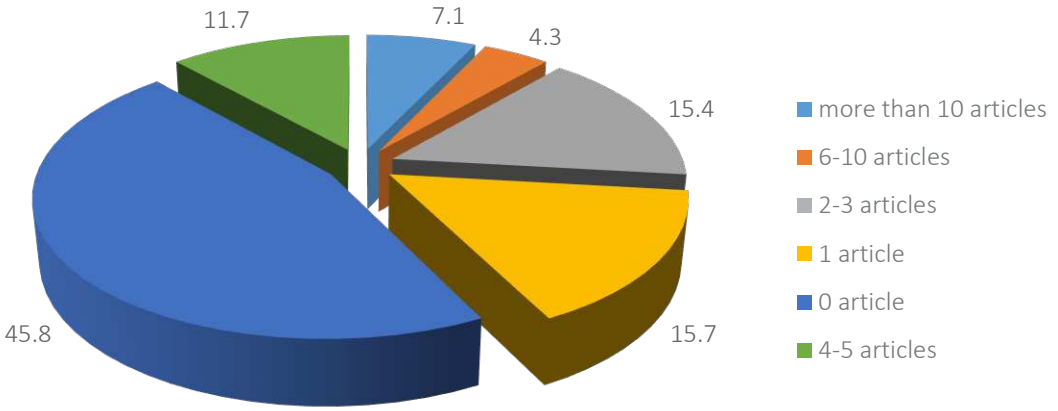

Figure 2. Percentage of scientists who have articles in Ukrainian scientific journals indexed by Web of Science and (or) Scopus

the following (respondents could have chosen several answers): "I do not know how to find journals and how to submit articles to them" (39.1%), "It is expensive" (34.8%), "I cannot meet the requirements of these journals" (26.1%), "I do not want (I cannot) wait long" (21.7%), "I submitted an article, but it has not yet been published, I am waiting for reviews" (17.4%), "I do not know English" (13.0%), "I tried to submit papers, but they are constantly rejected" (12.5%), "I do not consider these databases authoritative" (8.7%) (Figure 3). In addition, 4.3% of all respondents said that they had stopped their scientific career because of the requirements to have articles in journals indexed by Web of Science and (or) Scopus.

Respondents highlighted the reasons for the rejection of their articles by the editors of Ukrainian professional journals that are not indexed by Web of Science and (or) Scopus. 74.3% of the respondents who were published in such journals, faced no rejections, respectively only 25.7% of respondents had an experience of rejection. Those researchers whose articles were rejected stated the following reasons (respondents had the opportunity to choose several answers): inconsistency with the aim and scope of the journal (15.8%), lack of scientific novelty (12.9%), irrelevance (12.7%), inappropriate research methodology (12.5%), bibliography (8.6%), inappropriate structure of the article (7.3%), tables and figures (7.0%), plagiarism (6.5%), abstract (5.9%), language and style (4.3%), fabrication and falsification of the results (2.8%) (Figure 4). The articles of 10.6% of authors were rejected without any explanation.

The articles of only 4.3% of the respondents who have articles in Web of Science and/or Scopus indexed journals have not been rejected by the editors. Among the reasons for which the articles were rejected, the respondents named the following: inconsistency with the aim and scope of the

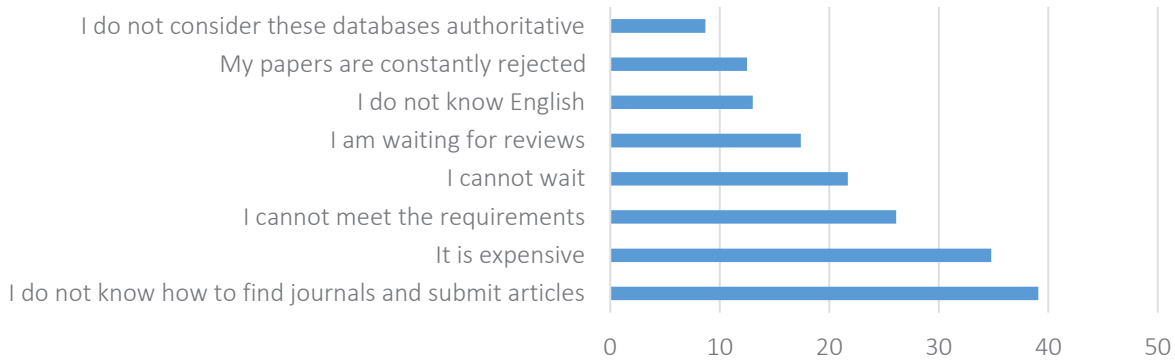

Figure 3. Reasons why 32.9% of respondents have no articles in journals indexed in Web of Science and (or) Scopus

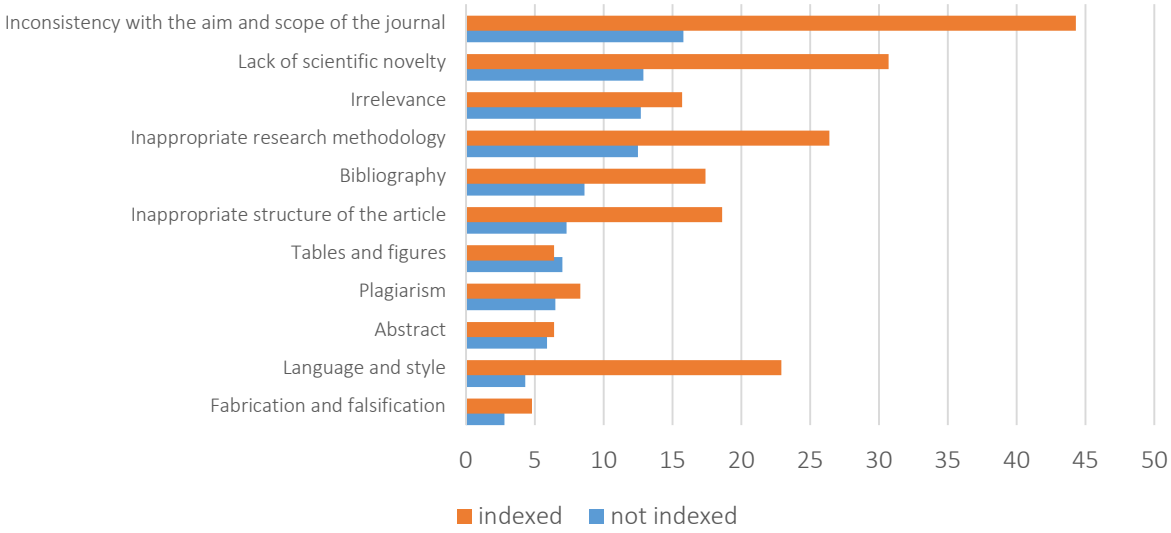

Figure 4. Comparing the reasons for the rejection of articles by journals editors indexed and not indexed by Web of Science and (or) Scopus

journal (44.3%), lack of scientific novelty (30.7%), inappropriate research methodology (26.4%), language and style (22.9%), inappropriate structure of the article (18.6%), bibliography (17.4%), irrelevance (15.7%), plagiarism (8.3%), figures and tables (6.4%), abstract (6.4%), fabrication and falsification of the results (4.8%) (Figure 4). The articles of 31.4% of authors were rejected without any explanation.

Only 38.6% (243) of respondents have never paid for publications of their articles. At the same time, some authors noted in the comments that they stopped paying for articles, stopped publishing in Ukrainian professional journals (representatives of physical and mathematical, chemical, and biological branches). In addition, 1.4% of the respondents stated that they do not pay for articles as a matter of principle and look for free submissions. 5.6% of the respondents believe that most Ukrainian professional journals fulfill only formal requirements by the Ministry of Science and Education of Ukraine and exist at the expense of authors who pay for publications. It is noteworthy that all those who answered so are published free of charge in international peer-reviewed journals.

61.4% of the respondents (387) paid for their publications. They indicated at whose expense this was mainly done: at their own expense (78.8%), at the expense of the institution where the author works (6.9%), grants (8.8%), at the expense of foreign co-authors (5.5%).

Regarding the motivation of scientists to write scientific publications, the following answers were received (respondents had the opportunity to choose several options): career advancement requires obtaining a scientific degree (academic title) (71.4%), self-development, gaining experience as a specialist (65.7%), compliance with the requirements of the institution (58.6%), share results, get feedback from the scientific community (55.7%), new acquaintances, establishing professional contacts (50.0%), to be quoted (35.7%).

3.2. Co-authorship

91.4% of the respondents (576) have co-authored publications. The survey showed a significant predominance of co-authored articles published in journals indexed by Scopus and (or) Web of Science. 77.1% of the 423 respondents who have articles in such journals have no individual articles, 8.6% of respondents have 1 individual article, 8.4% – 2 or 3, 2.9% – 4 or 5, 1.6% – 6–10, only 1.4% of the respondents have more than 10 individual articles. According to the survey, about a third of respondents have no articles in journals, indexed by Scopus and (or) Web of Science, primarily due to prejudice ("it's expensive"), administrative pressure (urgently needed article), poor English language skills, inability to meet the requirements of international journals, and lack of significant scientific results.

Respondents who have co-authored articles answered with whom they are most often published:

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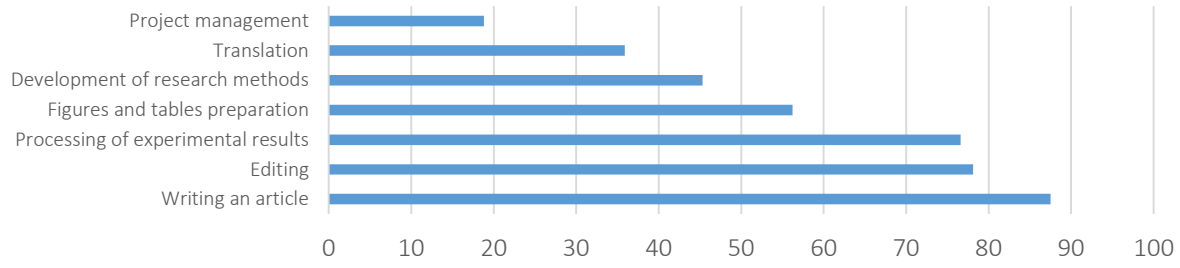

Figure 5. Roles of early career scientists as co-authors

with colleagues they work within the same institution (55.7%), colleagues from other institutions (22.7%), foreign colleagues (in peer-reviewed international journals) (10.4%), graduate students (8.4%), a supervisor (2.8%).

Respondents get acquainted with their co-authors (respondents could have chosen several answers): at work (61.2%), at conferences and seminars (52.5%), on foreign internships (25.4%), on Research Gate and other social media pages (22.4%), on academic mobility programs (17.9%), at thesis defense (7.5%), at summer schools (6%), taking online courses (3%), at exhibitions (1.5%). The roles of early career scientists as co-authors were distributed as follows (several options were available): writing an article (87.5%), editing (78.1%), processing of experimental results (76.6%), figures and tables preparation (56.2%), development of research methods (45.3%), translation (35.9%), project management (18.8%) (Figure 5).

Among the motives and stimulus for publishing co-authored articles, respondents identified the following (respondents could have chosen several answers and (or) added their own): cooperation with colleagues who have the knowledge and skills needed to achieve the objectives of the study (50%), co-payment for articles (33.8%), intellectual development (30.9%), saving time (17.6%), the chance of being quoted (16.2%), access to expensive equipment (12.4%), pressure of a manager who wants to have a publication (8.8%), lack of English language knowledge (7.4%), the tradition of co-authored publication by a Ph.D. student and a supervisor (3%) (Figure 6).

The study obtained some information about conflicts or other issues related to co-authored publications. 57.6% of the respondents who have co-authored articles did not have any conflicts with their co-authors. The rest got into problematic situations. In particular (respondents could have chosen several answers and (or) added their own): deadlines violated by co-authors (37.9%), "false" co-authorship (28.7%), unequal scientific contribution (22.7%), different scientific and methodological approaches that are difficult to agree with each other (13.6%), conflicting views on research results (10.6%), problems with following a "common" idea (9.1%), ignoring the comments of reviewers by co-authors (7.3%), contradictory motives when publishing articles (6.9%), personal conflicts between authors, mutual criticism (6.1%), language problems (6.1%), signs of plagiarism in co-authors' contributions (4.5%), non-transparent financial relations in the case of co-paid articles (3.0%) (Figure 7).

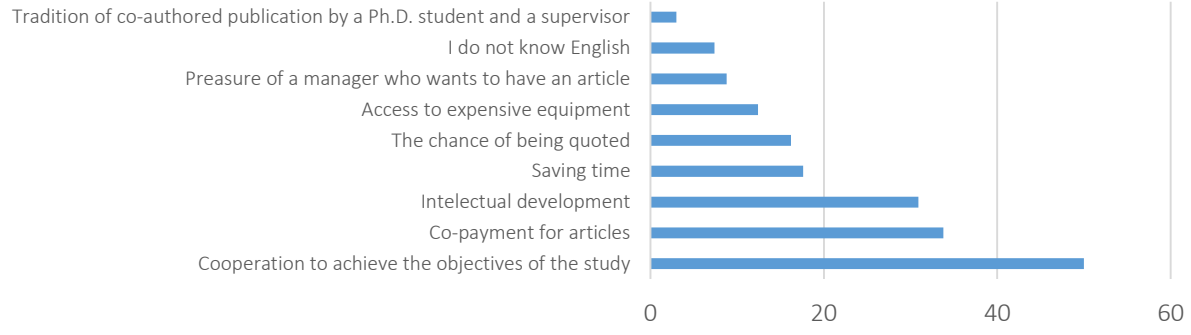

Figure 6. Motives and stimulus for publishing co-authored articles

Figure 7. Conflicts or other issues related to co-authored publishing

3.3. Reviewing

567 respondents answered that at least once their articles were blindly reviewed, and noted that the main comments of reviewers in the case of a positive review were as follows (respondents had the opportunity to choose several answers or add their own opinions): language and style (43.1%), structure (27.7%), bibliography (26.2%), research methodology (23.1%), inappropriate volume (12.3%), relevance of the study (9.2%), clarification of the details about the experiments (9.0%), remarks to the conclusions (7.5%), lack of scientific novelty (6.2%), graphic design (6.1%), abstract (3.1%), plagiarism (1.5%), errors in data description (1.5%). 122 of 567 (21.5%) respondents never had any comments from reviewers (Figure 8).

In the case of a negative blind review (342 respondents shared such experience), the main comments of the reviewers were as follows (respondents had the opportunity to choose several answers or add their own opinions): abstract (75.5%), clarification of the details about the experiments (40.0%), relevance of the research (38.9%), research methodology (38.3%), remarks to the conclusions (35.4%), language and style (33.6%), bibliography (26.3%), lack of scientific novelty (24.6%), graphic design (21.1%), errors in data description (20.8%), structure (19,0%), inappropriate volume (9.1%), plagiarism (6.9%). 20.9% of the respondents noted that their articles were rejected without comments at all. 74.6% noted inconsistency with the journals' aim and scope, and 2.3% of authors had an experience when editors could not find the reviewers for their papers (Figure 9).

The survey showed the pros and cons of communication between authors and reviewers (respondents could have chosen several answers or offered

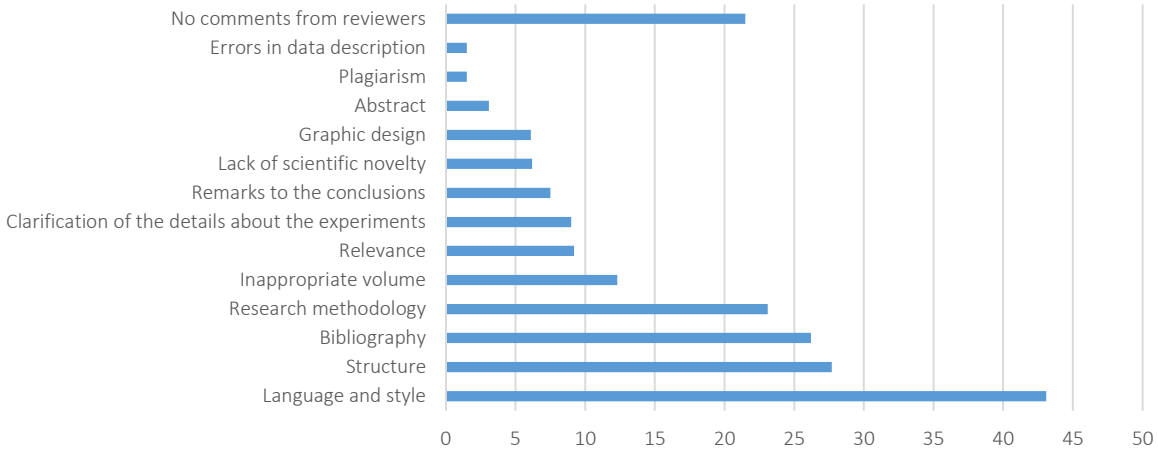

Figure 8. Reviewers' comments in the case of a positive review

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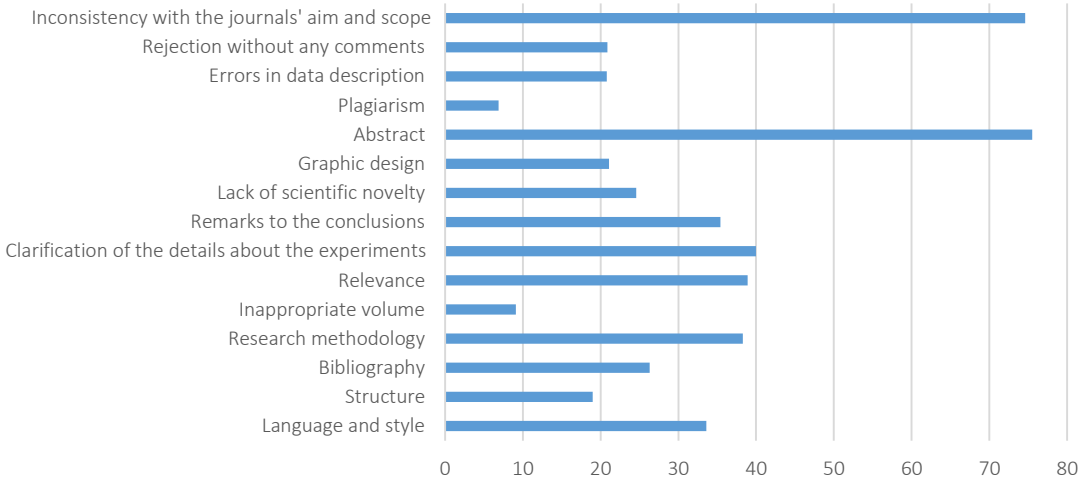

Figure 9. Reviewers' comments in the case of a negative review

their own). The study received answers from 611 respondents. The positives of reviewing were the following: significant improvement of the article (61.4%), scientific dialogue, understanding the expectations of reviewers (51.3%), understanding the review process itself (35.7%). But from time to time most of the authors had a negative experience: understanding that review is not an objective assessment of scientific work (52.8%), understanding that reviewers are biased and prone to make decisions based on the author's country of origin, institution, or authority (41.4%), the impression that the reviewer has not even read the article (19.0%), frustration of aggressive, contradictory, or incomprehensible comments (12.6%), the reviewer asked to cite his or her articles (7.4%), the reviewer rejected the article as irrelevant, and later wrote an article on this topic in the same journal (4.3%), ignoring new ideas (3.9%). 22.9% of the respondents noted the lack of opportunity to refute the reviewers' comments (Figure 10).

52.9% of the respondents (333) have performed the role of a reviewer at least once, the rest 47.1% have not reviewed scientific articles. The authors who have been reviewers at least once answered who invited them to review (respondents had the opportunity to choose several answers or suggest their own): invitations from the editor of the journal after publication in this journal (51.2%), invitations from the journal after publishing an article in other journals (41.5%), invitation (recommendation) of the scientific supervisor or the chief of scientific school (scientific group) (22.0%).

The question was asked whether the respondents faced difficulties when reviewing the manuscripts. It was found that only 5% of the respond-

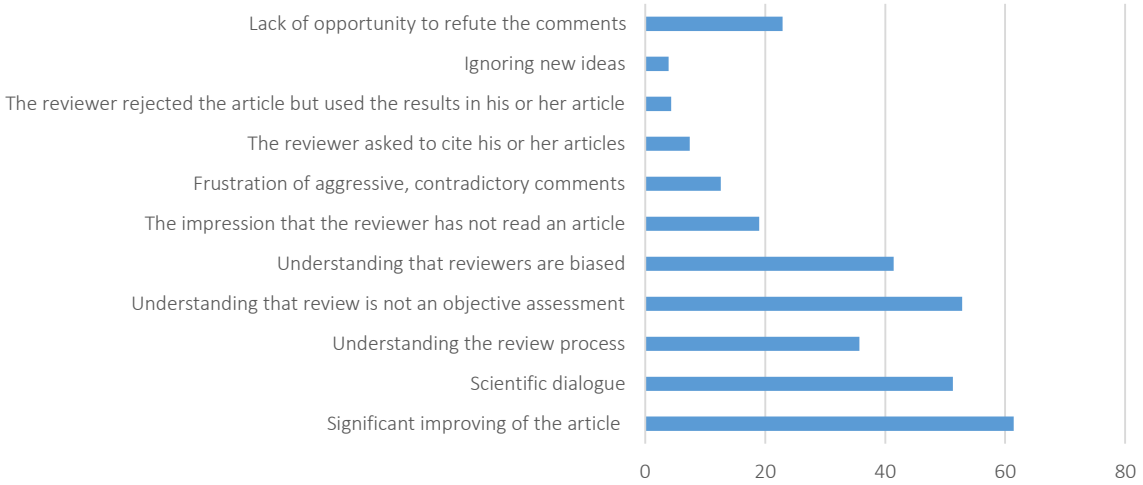

Figure 10. Pros and cons of communication between authors and reviewers

ents who were reviewers had not faced difficulties. Meanwhile, the rest noted the following problems (respondents could have chosen several options): providing obviously poor quality articles for review, which should be rejected immediately, without even involving reviewers (47.5%), lack of time (42.5%), the request to review an article that does not match reviewer's qualifications (32.5%), no access to data to check dubious results and integrity of the authors (25.6%), it was uncomfortable to criticize other people's mistakes (20.4%), lack of instructions for reviewers (17.1%), ignoring significant remarks by authors (13.5%), a conflict of interests (5.3%), the reviewer had to do author's work (5.0%).

Performing the role of a reviewer gave respondents the following advantages (respondents could have chosen several answers): acquaintance with new trends in the industry (75.5%), writing skills improvement (51%), mastering new research methods and theories (40.8%), proposals for cooperation (co-authorship, involvement in projects, etc.) (24.3%), recognition among colleagues (16.3%), career promotion (16.3%). But 20.7% of the reviewers were interested in this activity only for reporting, and 4% did not see any benefits for themselves in the reviewing.

Regarding the types of reviewing that the respondents prefer as authors, the answers were distributed as follows: double-blind peer review (41.4%), triple-blind review (24.3%), open review (12.9%), single-blind peer review (8.6%), preference to ask someone to sign a ready-made review (4.3%). 8.5% of the respondents said that they would like the reviews to be publicly available.

Meanwhile, as a reviewer, respondents would prefer the types of reviewing in the following percentage: double-blind peer review (40.0%), triple-blind review (28.6%), open review (15.7%), single-blind peer review (11.6%), sign a ready-made review (4.1%).

3.4. Academic integrity and engagement in scientific work

The survey revealed the problem of academic integrity violation (a set of ethical principles and rules that ensure confidence in the results of scientific achievements) by the scientists. In one form or another, 32.9% of the respondents admit using text borrowings in a scientific article without reference to the author, in particular: 23.1% of all respondents practice self-plagiarism (insert pieces from their previous publications), 22.3% used to publish the results of subordinates (for example, student projects) as their own, 19.7% take research methods from other scientists' articles, substituting the results, 18.7% always refer to quotations, but sometimes can present borrowed ideas as their own, 9.9% use the method of "meat-chocolate", for example, take an article about the meat market and rewrite it about the chocolate market with modified data, 8.2% pay for ready articles, 7.5% do not refer to literal text borrowings, 6.5% of the respondents rewrite other scientists' materials in other words. Meanwhile, 67.1% of the respondents respect the principles of academic integrity. However, 5.1% noted that plagiarism can be unconscious when a scientist works on a certain topic for a long time and does not accidentally refer to the source of a certain idea.

5.6% of all respondents admitted that they wrote articles where they substituted the results without conducting experiments, deliberately distorted the results of the study, and forged experimental data. Meanwhile, 7.1% noted that they rejected results that did not correspond to the proposed hypothesis, and 4.1% of the respondents put forward a different hypothesis depending on the results obtained.

When asked about the attitudes to citations, respondents answered as follows (they could have chosen several answers): "I quote only articles, which correspond to the purpose and objectives of my article, mainly from international journals indexed by scientometric databases" (62.9%), "I quote only publications that meet the purpose and objectives of my article, mainly from Ukrainian journals" (37.1%), "I try to quote myself" (22.8%), "I quote managers or supervisors without scientific need for the article" (10.3%), "I agree on mutual citations" (8.6%).

38.5% of the respondents believe that a university lecturer should be engaged in scientific work. Some positive answers were accompanied by arguments, such as: "yes, because it is a development",

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"yes, because if you do not do scientific work, you can lose touch with new scientific results and give students obsolete data", "yes, because teachers who are not engaged in scientific work are conservative and do not use modern methods", "yes, but only for some bonuses from the university", etc.

26.0% of the respondents believe that a university lecturer should have a choice whether to engage in scientific activities. In particular, respondents noted that "teachers do not always have time to teach and conduct quality research", "teachers need to have a different distribution of pedagogical and scientific workload depending on the relevant abilities", "the right to choose increases motivation", "it cannot be quality science, if articles are needed only for reporting, such activities only discredit science", "if the management requires too many articles, then the quality of both publications and teaching decreases", "science on demand does not correspond to creating something new, when in experiments unexpected results are obtained, that requires time to rethink, search for explanations, errors, reworking, and so on". 16.0% of the respondents stated that the requirement to engage in research should depend on the specialty, because "for some specialties we do not have sufficient resources for research, but it is enough that the teacher simply gets acquainted with modern achievements to be able to pass knowledge about them to students", "there is almost nothing new in geometry or higher mathematics, but chemists and biologists have to do research", "practice teachers, people who come to universities, for example, from business, modern marketers, business leaders, accountants may not be interested in scientific activities, but this should not diminish the importance of their experience and prevent opportunities to develop students' practical skills that are valued by employers", "every teacher should be a practitioner in his or her field", "teachers who work with senior students and coordinate students' scientific work should be engaged in researches".

19.5% of the respondents answered that a university lecturer should not be engaged in science, in particular, they wrote the following comments: "science is creativity, and creativity is difficult to engage in coercion, in addition, it is difficult to assess formally", "a talented teacher is not always a talented scientist, and vice versa", "skills and desire to learn throughout life are the main characteristics", "there are scientific institutions with the responsibilities of employees to conduct research", "education is about scientific activities", "requirement to write articles generates academic dishonesty".

4. DISCUSSION

By all indicators, the criteria for evaluating scientific articles by the editors of international journals are higher than Ukrainian ones. This is also evidenced by the comparative rate of articles' rejection (25.7% vs 95.7%). The negative trend is that compliance with formal requirements, for the sake of career advancement, still dominates among the motives for publishing articles.

The study fully agrees with Sonnenwald (2007), who determined the following benefits of co-authorship: intensification of research, improvement of the quality of obtained results, better design, etc. The survey confirms previous results that, through co-authorship, researchers can improve their results by sharing responsibilities and receiving feedback from colleagues. Co-authorship also helps to avoid zero publishing activity caused by long data collection or reviewing (Henriksen, 2018). At the same time, negative effects of co-authorship were found: deadlines violated by authors, unequal scientific contribution, "false" co-authorship, different scientific and methodological approaches that are difficult to agree with each other, the need to include as co-authors people who do not participate in the research and writing of the article, conflicting views on research results, difficulties with following a "common" idea, personal conflicts between authors, rejection of mutual criticism, plagiarism, non-transparent financial relations in the case of co-paid publications, contradictory motives when writing articles, etc. When co-authors share information, it also may cause it to be distorted or lost (Kulkarni, 2015). In addition, there is a danger that no one will be willing to be responsible for the work, and groups of influence can be formed that determine research policies and make financial decisions in their fa-

vor (Aragon et al., 2009). Moreover, co-authors' teams need coordination (Powell, 1998).

At first sight, the article reviewing is a thankless task because reviews are usually not paid, cited, or published. But a reviewer helps other scientists improve their papers or save readers' time, preventing them from reading poor-quality articles (García et al., 2019; Tennant, 2018). The findings are consistent with Breuning et al. (2015), who interviewed reviewers for reasons why they refused to review the manuscripts. Similar results regarding the problems in reviewing the papers were obtained: lack of time, incompetence on the topic of the article being reviewed, a conflict of interests, etc. But early career scientists encounter some additional problems such as lack of instructions for reviewing, ignoring significant remarks by authors, difficulties while criticizing other people's mistakes. Meanwhile, in the world publishing practice, the main reason for the refusal is lack of time (Willis, 2016). It was also found that more relevant to reviewers are the criteria for evaluating a publication, such as consistency with the journals' aim and scope, abstract, relevance of the study, research methodology. With less frequency, reviewers reject articles on such indicators as language and style, and structure.

CONCLUSION

This study investigated the involvement of early career scientists in authorship and co-authorship practices, engagement in the peer review process, as well as their science communication attitudes. The results of the survey show that in general early career scientists are aware of the need to achieve world standards of research publishing. The system of professional communication sets the conditions of communicative behavior and determines the boundaries of communicative interaction. As a result of a survey, it was found that co-authorship has a positive effect on the publishing activity and the quality of publications. However, ethical problems that arise because of co-authorship were also revealed: distribution of scientific contribution, authorship of the chief, etc. The survey also showed that reviewing helps early career scientists to improve their articles, understand the expectations of the reviewers and the review process. Performing the role of a reviewer gives early career scientists some advantages, such as acquaintance with new trends in the industry, writing skills improvement, mastering new research methods and theories, proposals for cooperation, etc.

AUTHOR CONTRIBUTIONS

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