

## RETHINKING ACADEMIC AUTHORSHIP PROTECTION IN THE ERA OF OPEN SCIENCE AND OPEN ACCESS

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### Abstract

The topic of this study is driven by the need to reconsider concepts, norms and tools in the field of academic authorship protection, which, in the era of open science and open access, would allow not only to introduce restrictive measures, but also to maintain a balance between the interests of copyright holders and users and provide authors with a wider range of opportunities to research, publish and disseminate the results of their scientific works. Changes in the nature and essence of modern science, pace of its development, content of new scientific knowledge and forms of protection of academic authorship are influenced by both external and internal factors. It has been established that external (extra-academic or extra-scientific) socio-cultural and economic factors in the development of science are not constant, but are always associated with the progress of society. At the present stage, these factors primarily reflect the impact of such processes as globalization, internationalization, integration, technologization and digital transformation. The main trends in the development of science also arise under the influence of internal (intra-academic or intra-scientific) intellectual factors that contribute to the emergence of original ideas, motivate individual scientists to create new theoretical knowledge and practice-oriented innovations, encourage them to seek adaptive channels that allow them to communicate and disseminate the results of their research, thus realizing the basic ideals of scientific cognition. Together, these external and internal factors are generating an acute social demand for organizational and financial models, methods and technologies, as well as ethical standards and legal means to protect academic authorship that did not exist before. We conducted our study in light of the evolving paradigm of "Open Science" with all its attributes (open access, transparency, inclusion, etc.) aimed at popularization, openness, accessibility and benefits of academic/scientific research (e.g., data collection, data analysis, variables, samples, software, publications, dissemination of findings, etc.) to all members of society, whether amateur or professional. The UNESCO recommendations, enshrined in 2021, articulated the key values and guiding principles of "Open Science", namely open scientific knowledge, open scientific infrastructure, open scientific communication, open collaboration between scientists and those outside the academic community, open dialog with different knowledge systems, etc. Studying the materials presented by UNESCO and other earlier documents proclaiming and even promoting the principles of open access to academic and scientific journals and literature (e.g., Budapest Open Access Initiative, 2002; Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, 2003, etc.), we came to conclusion that advancement of the best ideas of open science in Russian society is impossible without certain educational work with university teachers, scientists and persons outside the academic community, as well as without legal support and reconsideration of approaches to protection of the rights of authors. The purpose of this article is to clarify the conceptual apparatus of "Open Science"; reveal the features of "Open Science", its principles and attributes; identify external and internal factors influencing modern science and establish directions for its development; systematize the forms of possible violations of the rights of authors (e.g., unfair borrowings, academic fraud, plagiarism, etc.) and ways to protect academic authorship from the point of view of legal regulation, possibilities of the Creative Commons open license and in the context of the

development of information and digital technologies that provide easy access to the network and Internet resources. This article might be of interest to university teachers, educators, methodologists and researchers.

**Keywords:** academic community, academic authorship, protection, research, open science, open access.

## 1 INTRODUCTION

The authors' personal experience as university professors suggests that education and science are currently developing under the influence of both external and internal factors, which together determine the direction and pace of academic, and research activities, the structure and content of new scientific knowledge, as well as the forms and legal mechanisms of academic authorship and copyright protection. It has been established that external (or extra-scientific) socio-cultural and economic factors affecting science and its development are changeable but always related to the progress of civilization. At the present stage, they primarily reflect the impact of such processes as globalization, internationalization, integration, technologization and digital transformation of society. These processes increase the role of science and technology in modern society and make them not only change the way of living, studying, working or socializing, but also influence people's basic worldview, their moral values, motivate them to acquire new knowledge, expand the range of research activities and deepen society's understanding of the world. The close connection between science, technology and society (STS) is particularly important for university education, which inherently provides fertile ground for the formation and development of life guidelines, appropriate attitudes, professional identity, academic integrity and research ethics (Faulkner et al., 2012). Moreover, the deepening relationship between science, technology, and society (STS) creates an interdisciplinary field of study in which scholars from different academic fields, including lawyers and other professionals, will find important new topics of study and a target audience for sharing research findings in the context of urgent scientific issues of our times (Bychkova, 2020).

Changes in the nature, essence and trends of academic research activities also occur due to internal (intra-academic or intra-scientific) intellectual factors that promote emergence of original ideas, motivate scientists to create theoretical knowledge and breakthrough innovations and generate new and updated organizational and financial models, technologies and methods, ethical norms and legal ways to protect the rights of authors that did not exist before (Kleeva & Maksimov, 2021). The internal factors in this context include: the "professionalization" of academic profession (including specialization and standardization); massification of academic workforce; individual predisposition and readiness of academics to combine teaching and research activities; social and interpersonal relations of individuals at universities and networks of like-minded people; values and norms prevailing in education and science at a particular period of time; organizational forms and levels of scientific cognition (perceptual, empirical, theoretical, meta-theoretical, transdisciplinary) specific to a certain historical stage (Lebedev, 2018); logical-methodological and conceptual-theoretical approaches to science (terminology, concepts, theories, technologies, methods); recognition of importance of quantitative research output in academic careers; acceptance of emergence of strong external incentives for publication activity following the introduction of research rankings in some universities, etc. (Vincent-Lancrin, 2009).

As a result of our study, we conclude that the most critical factors contributing to the growth of research today are related to the establishment of a harmonious relationship between science, technology and society (STS) in a contemporary context mediated by the process of rapid digitalization of all spheres of public life. In synergy, STS and digitalization (based on ICTs (information and communication technologies), the Internet, artificial intelligence (AI), big data, algorithms, sensors, etc.) are also bringing positive changes to all areas and aspects of science, from agenda-setting, data collection and analysis to experimentation, knowledge sharing and public engagement (citizen science) in decision-making and policy-forming (Nolan et al., 2020). The shift towards STS and digitalization facilitates research, collaboration and exchange of ideas or expertise for everyone, even outside academic community, across disciplines and in the context of real-world experiences (Vincent-Lancrin, 2009). This approach furthers the "open science" paradigm, which aims to make scientific research, data, educational resources, infrastructure and publications open, transparent and freely available to everyone without barriers (Chiwari & Lockhart, 2024). At the same time, however, open science practices have resulted to an increasing number of cases of academic misconduct that range from minor (as "copy and paste", unfair borrowings, paraphrasing, summarizing, synthesizing, etc.) to much more serious offenses (as copyright infringement, academic fraud and various forms of plagiarism) (Ainoutdinova et al., 2022). There is an urgent need to reconsider concepts, norms and tools for the protection of academic authorship, as well as pedagogical strategies to train researchers to comply with legal and ethical standards.

The purpose of this study is to clarify the conceptual apparatus of "open science"; to identify the features of "open science", its principles and attributes; to systematize the cases of possible infringement of authors' rights (e.g., unfair borrowing, academic fraud, plagiarism, etc.) in the context of the development of close links between STS and digitalization, and to propose alternative strategies to traditional copyright law for the protection of academic authorship, relying on the beneficial potential of open Creative Commons licenses.

## **2 METHODOLOGY**

This study was conducted within the framework of socio-pedagogical, integrative, contextual, competence-based and comparative approaches covering all aspects of university teachers' academic activities in the conditions of digital transformation in Russia. We sought to identify how a productive balance could be achieved between the two key responsibilities of academics – teaching and research – without compromising the quality of one or the other duty. We conclude that although universities today introduce research rankings and reward systems that influence how faculty members organize their activities, much depends on the individual predisposition and readiness of academics to effectively combine teaching and research. This may require additional knowledge, skills and competencies in time management techniques, advanced forms of analytical and critical thinking, ability to perceive real-life situations from an academic perspective, replication of best teaching practices in research, collaboration with colleagues and like-minded people on various scientific issues, knowledge of legal rules and regulations for the protection of academic authorship, adherence to the principles and concepts of academic integrity and research ethics, etc. In addition, as humanity increasingly perceives and creates the world through a multitude of digital technologies, educators need to be aware of how ICTs, the Internet, artificial intelligence (AI), big data, algorithms, sensors, models, etc. can shape and contribute to their research and make their findings open and transparent to all (Khan, 2017).

To clarify the conceptual apparatus, we identified and defined the meaning, core values, guiding principles and attributes of Open Science, and considered the opportunities, challenges and priority areas of actions on open access and open data within the open science paradigm based on Article 27.1 of the Universal Declaration of Human Rights (UDHR); the UNESCO Recommendation on Open Science (Azoulay et al., 2022); the previous documents enunciating the principles of open access to research and academic journals and promoting the Internet as a medium for disseminating global knowledge – The Budapest Open Access Initiative (BOAI) launched by Open Society Institute in 2002 (<https://www.budapestopenaccessinitiative.org/>) and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, adopted at the international conference by Max Planck Society in 2003 (<https://openaccess.mpg.de/Berlin-Declaration>); the World Intellectual Property Organization (WIPO) portal allowing to learn more about the types of IP, international standards, copyright protection issues and relevant case-study (<https://www.wipo.int/portal/en/>); the Russian codes of law regarding Criminal, Civil and Administrative liability for IP infringement; Creative Commons initiatives and their licenses for academic authorship protection in the era of digital breakthroughs (<https://creativecommons.org/>), etc.

The empirical part of our study was conducted in the form of a survey, the purpose of which was to help uncover the problem of unfair practices and plagiarism in the academic community and to learn about the attitudes of researchers towards alternative tools of academic authorship protection and their readiness to use them in their publishing activities. When it comes to unfair practices in academic or research activities, some people think that it is primarily a problem for students or novice researchers. However, our survey results showed that malpractice and plagiarism remain a problem long after students graduate and novice researchers become prominent academics or researchers. 300 researchers and humanities teachers from Kazan federal university (Russia) were asked to compare the earlier findings with their personal experiences and rank 10 different types of unfair practices, including plagiarism, due to their severity, seriousness and commonness. Based on the feedback, it was revealed that respondents quite often use secondary sources (88%) and invalid sources (79%); reuse or duplicate their own previous studies and papers without a due attribution (75%); paraphrase another person's writing or rewrite another person's words without citation (67%); provide repetitive research (62%) or submit a single paper to multiple publications as a replication (51%); provide misleading attribution or inaccurate/ insufficient author information (41%); violate a code of conduct or act illegally through unethical collaboration (16%); copy and paste another author's words (verbatim) or works without proper attribution, indentation or quotation marks (11%); participate in extreme scenarios of complete plagiarism by depriving the original authors of credit for their work and potentially stealing their publication without doing any original work themselves (5%) (Ainoutdinova et al., 2022). Attitudes towards Creative Commons open initiatives and CC licenses seem preferable compared to traditional copyright protection to most respondents (86%) because they are less restrictive, clear and concise (76%).

### 3 RESULTS AND DISCUSSIONS

Analysis, synthesis and comparison made it possible to study and summarize thematically relevant scientific information from Russian and foreign sources, which allowed us to conclude that the impact of digitalization on science, technology and society (STS) has created a new science paradigm known as Open Science, which meets the requirements of the present day (Mirowski, 2018; Gong, 2022; Baldwin, 2023; Chiware & Lockhart, 2024). Some authors link the history of Open Science to the emergence of scientific journals, such as the Philosophical Transactions of the Royal Society, as early as the mid-17th century and attribute its origin to a formalized system of disseminating scientific knowledge through open exchange channels (Gong, 2022; Baldwin, 2023); others associate the evolution of Open Science paradigm with governments and the development of public science policy that reflect the aspirations of the general public (Gong, 2022); some authors highlight the informatization of global society that has unlocked the demand for the open exchange of scientific research and knowledge (Baldwin, 2023). In any case, all authors agree that with the advent of the Internet and digital technologies, Open Access and Open Data are the most characteristic features of the current Open Science movement as they give new impetus to the development of science and technology, create unprecedented conditions for open exchange of research results, and promote public interest in research findings and application of scientific and technological innovations (Gong, 2022; Baldwin, 2023).

According to UNESCO, Open Science (OS) can be defined as "an inclusive construct of various movements and practices" that aim to make scientific knowledge, research, data, code, publications, etc. openly available, freely accessible and reusable for everyone without barriers and beyond the traditional scientific community (UNESCO, 2021; Azoulay et al., 2022). Based on the shared core values (quality and integrity; collective benefit; equity and fairness; diversity and inclusiveness) and guiding principles (transparency, scrutiny, critique and reproducibility; equality of opportunities; responsibility, respect and accountability; collaboration, participation and inclusion; flexibility; sustainability) Open Science activities globally promote scientific collaboration across various scientific disciplines and aspects of scholarly practices and increase the transparency, accessibility and impact of scientific knowledge for the benefit of science and society (UNESCO, 2021; Azoulay et al., 2022). While UNESCO encourages open access to scientific knowledge and proclaims it to be as open as possible in light of its key "open" principles (open scientific knowledge – through open scientific publications, open research data, open educational resources, open source software, open hardware; open science infrastructures – both virtual and physical; open engagement of societal actors – based on crowdsourcing, crowdfunding, scientific volunteering, citizen or participatory science; open dialogue with other knowledge systems – including indigenous people, marginalized scholars, local communities), some proportionate and reasonable restrictions may still be necessary to protect, for example, human rights, confidentiality, intellectual property rights, personal information, etc. (Gong, 2022; Azoulay et al., 2022). Thus, while OS encourages scientists to develop data management tools and techniques to make as much data as possible shareable and reproducible, accessibility must be realized without compromising the rights of authors.

Important milestones in the history of the Open Science movement show that many initiatives and practices have focused on open access and alternative public copyright licenses available to everyone free of charge (Lessig, 2004; Abadal, 2014; Landi et al., 2019; Heise & Pearce, 2020; Misra, 2020; Baldwin, 2023). Back in 2002, at one of the Open Society Institute (OSI) meetings in Budapest, scholars and researchers from transdisciplinary fields proposed the international Budapest Open Access Initiative (BOAI). According to BOAI 2002 Declaration all scholarly or scientific literature should be freely accessible and available on the Internet to anyone around the world "without expectation of payment" (Baldwin, 2023). Further, in 2003, under the auspices of the Max Planck Society and the European Cultural Heritage Online (ECHO) project, the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities was developed and signed to encourage researchers to publish their results in a Web-based open access research environment (Heise & Pearce, 2020; Baldwin, 2023). These declarations were later supported by appropriate actions: the Public Knowledge Project in Canada released the open source software application "Open Journal Systems" for managing and publishing scholarly journals; Lund University in Sweden launched the Directory of Open Access Journals (DOAJ) as a central directory of high quality peer-reviewed open access journals; and in the United States, Lawrence Lessig and Eric Eldred founded the non-profit organization "Creative Commons", which produced several copyright licenses, known as Creative Commons (CC) licenses, available to the public for free (Lessig, 2004; Margoni & Peters, 2016). Lessig and Eldred saw the need for new types of licenses for authors who wanted to share their works in simpler and more flexible modes in open access environment, but still in compliance with copyright law; the founders wanted to strike a balance between the existing overly restrictive copyright license regimes and excessively open public domain status licenses and create something unique (Lessig, 2004). Since then, six different types of CC licenses have been published, ranging from the most to the least permissive, but all with an emphasis on the credit to be given to the

author, namely: CC BY, CC BY-SA, CC BY-NC, CC BY-NC-SA, CC BY-ND & CC BY-NC-ND (Lessig, 2004).

Today, millions of authors and high quality peer-reviewed journals, including Russian publishers, prefer to work with Creative Commons licenses (<https://creativecommons.org/>) due to their advantages comparable to other types of licenses. CC licenses provide an alternative to standard copyrights, enabling: authors – to distribute any content for free, without any royalties to the author or copyright holder; users – to freely use, share, mix and build upon existing works at their own discretion and for an unlimited number of times; communities – to develop and maintain a thriving international and transdisciplinary community of shared knowledge, culture and socially-oriented values, build capacity and use any content in a legally robust way in a tech-based open ecosystem, generate practical solutions and bring people together to create and accelerate innovation for the advancement of science, technology and society (Lessig, 2004; Margoni & Peters, 2016; Landi et al., 2019). In addition, each Creative Commons license allows authors (licensors) to retain copyright by allowing others to copy, distribute, and use their copyrighted works for commercial or non-commercial purposes; each CC license also guarantees licensors authorship, it is recognized worldwide, and lasts as long as a copyright license.

The Creative Commons system seems very easy to understand at a basic level, but nevertheless there can be many questions about individual licenses, their structure, advantages and disadvantages. In the process of working on the topic, we highlighted such a feature of CC public copyright licenses as their unique and innovative "three-layer" design (Lessig, 2004). The first layer is created specifically for lawyers, it serves as a traditional legal tool as a "lawyer-readable" legal text and is normally called the "Legal Code" of the license; the second layer is aimed at the ordinary user, it comprises the "human readable" version of the license in a form of a "brief description" of some of the most important terms and conditions and is known as Commons Deed; the third layer is designed as a "machine readable" version in a specific "machine readable" CC Rights Expression Language (CC REL) for easier recognition the works available under CC licenses by search engines and software programs on the Internet, including the key freedoms and obligations. Taken together, the three layers of the license provide a clear understanding of the essence of the Creative Commons approach towards rights, freedoms and obligations well understandable to lawyers, authors, ordinary users and even machines, software applications and other technologies on the Internet (Lessig, 2004; Margoni & Peters, 2016; Baldwin, 2023).

Each of the six versions of the CC licenses shares many similarities with the others, but each has its own features as well. In particular, the "CC BY" mark is common to all CC licenses, it indicates that it is a Creative Commons product, and requires attribution by giving credit. As a separate license "CC BY" is the most liberal and the least restrictive Creative Commons license; it allows any user to "to distribute, remix, adapt, and build upon the material in any medium or format" even for commercial purposes, so long as obligatory "attribution is given to the creator" (Lessig, 2004). Many agree that this is the simplest and most convenient of licenses, and many journals offer this option quite often. However, there may be some pitfalls here, as all that is required of "CC BY" is proper attribution when reusing, so original authors may lose control over their content and become victims of abuse and unfair practices. In addition, reuse of content and other terms cannot be revoked under a Creative Commons license once it has been obtained – unlike copyright removal. Thus, authors need to choose very carefully the license they will use and read all the terms and conditions carefully before signing the license agreement. It is important to know that licenses marked SA (ShareAlike) imply the same CC license terms for the derivative project; NC (NonCommercial) mark proscribes commercial use of the author's work or object; ND (NoDerivs) mark prohibits editing and translation of the work or object into other languages. For example, the CC BY-NC-ND version is the most restrictive and prohibitive of all CC licenses, while CC0 (aka CC Zero) allows authors to put their works into the worldwide public domain and completely relinquish copyright without any conditions. It becomes obvious that knowing the features of open CC licenses, being able to read the terms and explain their markings will help authors, users, etc. to choose the most appropriate version and avoid misunderstandings (Lessig, 2004; Margoni & Peters, 2016; Baldwin, 2023).

#### **4 CONCLUSION AND RECOMMENDATIONS**

Summarizing the results of the study, we conclude that the Open Science paradigm directly correlates with the society's need for technological innovation and openness, including open data and open access; creates new forms and culture of scientific knowledge acquisition, dissemination and exchange among academics and scientists; motivates them to productively combine teaching and research duties and generates new and less restrictive forms of academic authorship protection (Khan, 2017; Gong, 2022; Baldwin, 2023). Based on the UNESCO Recommendations, we envision Open Science (OS) as an effective means of "enhancing reproducibility, transparency, information sharing and collaboration through increased open access to scientific materials, tools and processes" for the benefit of science and society at regional, national and

international levels, especially in a time of uncertainty and technological change. The processes of creating new scientific knowledge should be open, the results of research should be reusable, and the range of publicly available scientific disciplines and aspects of scientific practice should not be limited and meet the goals of OS, namely accessibility, transparency and inclusion (UNESCO, 2021; Gong, 2022; Azoulay et al., 2022). Accessibility implies open access to research data, scientific publications and training materials for any user on the Web; transparency requires open peer review of findings (in peer-reviewed journals), logical analysis, comparison of presented facts, reality-based inference and reproducibility of results; inclusion leads to the involvement of a wider range of stakeholders without specialized knowledge and experience (as citizen science actors) in the creation and dissemination of scientific knowledge (UNESCO, 2021).

However, in the era of digital technologies and easy access to Internet resources, openness of scientific publications and accessibility of the results of other people's research can become an issue of special concern, since they can mistakenly be perceived by some users as a call for unfair borrowing and even plagiarism. Often such people look for justification of their misdeeds in lack of time, in high requirements for publications, as well as in one of the contradictions accompanying the creation of new scientific knowledge. It consists in the fact that, an important aspect of scientific cognition and generation of new original, useful or unique knowledge is the use of theories and ideas of other people; so, the creation of new knowledge always requires deep study, understanding, comprehension and even use of theoretical works of other authors or teams of authors to some extent (Ainoutdinova et al., 2022). Thus, if scientists investigate a new problem or look for something unexplored or contradictory in the already established knowledge, they are likely to conduct original, useful, or unique scientific research, building it on the already existing theoretical knowledge or already conducted research. This raises the question about availability of special strategies and techniques that could curb the "temptation" to act dishonestly and take advantage of the results of others' intellectual endeavors. Similarly, scholars and researchers need to be educated and aware of what their expectations may be regarding creating, sharing, licensing, and copyright to be able to make informed choices (Gong, 2022).

We believe that there are at least three approaches to solving this problem: ethical, psycho-pedagogical and legal. From an ethical perspective, the most important strategy in creating new scientific knowledge is to follow the principles of academic integrity and research ethics. International Center for Academic Integrity – ICAI (<https://academicintegrity.org/>), a well-known consortium of academic institutions and scientific organizations, considers the concept of "academic integrity and research ethics" as a moral code and ethical policy of academic community and defines it as adherence to five fundamental values of science, namely, honesty, trust, fairness, respect, responsibility, and determination to act in accordance with them in all conditions and under all circumstances. The principles and values of ICAI correspond and often coincide with the principles and values of the Open Science paradigm enshrined in the UNESCO's recommendations (UNESCO, 2021; Ainoutdinova et al, 2022; Azoulay et al., 2022). Accepting the values and principles of ICAI and Open Science should be an integral part of any scientist's worldview and research ethics. In terms of psycho-pedagogical strategies to counter dishonest practices and plagiarism, two major tools for transmitting other people's words and ideas can be legally used in research and publications without violating authors' rights and principles of academic integrity and research ethics; these are indirect speech (paraphrase; summary; synthesis of information from different sources; review or response writing) and direct quotation. To avoid violations, scholars using other people's works should only cite the original authors and give them credit. Importantly, the amount of citation should always be justified by its purpose (Ainoutdinova et al, 2022).

With the development of the Open Science paradigm, it is also necessary to revise legal concepts, norms, tools and approaches in the field of academic authorship protection to directly link them to society's demands for openness, accessibility and innovation. Despite the transition to a digital world, open infrastructures and disruptive innovations that have changed and reshaped the way we live, learn, research, create and share information, we see that in many countries copyright rules are tightening and continue to hinder open creativity, open access to publications and open sharing of scientific knowledge. The idea behind copyright protection is that, on the one hand, it protects intellectual property, ensures integrity of research, promotes innovation, provides financial benefit to authors, establishes ownership of a work by creating rights that prevent unauthorized use of content, etc. However, on the other hand, copyright law also imposes limitations on users' rights, potential barriers to access and reuse of copyrighted works, complexities in enforcement, and difficulties in proving authorship in court (Faulkner et al., 2012). Authors need to know that today there are alternative licenses and tools, such as Creative Commons, that help to overcome these challenges and limitations by giving everyone permission to use their work in a certain way, thus making access to scientific knowledge open, transparent, collaborative and reproducible (Misra, 2020). Creative Commons ideally serves the purpose of promoting and popularizing open science while still preserving the copyrights of the authors' works.

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