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Sorting out journals: The proliferation of journal lists in China

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Abstract

Journal lists are instruments to categorize, compare, and assess research and scholarly publications. Our study investigates the remarkable proliferation of such journal lists in China, analyses their underlying values, quality criteria and ranking principles, and specifies how concerns specific to the Chinese research policy and publishing system inform these lists. Discouraged lists of "bad journals" reflect concerns over inferior research publications, but also the involved drain on public resources. Endorsed lists of "good journals" are based on criteria valued in research policy, reflecting the distinctive administrative logic of state-led Chinese research and publishing policy, ascribing worth to scientific journals for its specific national and institutional needs. In this regard, the criteria used for journal list construction are contextual and reflect the challenges of public resource allocation in a market-led publication system. Chinese journal lists therefore reflect research policy changes, such as a shift away from output-dominated research evaluation, the specific concerns about research misconduct, and balancing national research needs against international standards, resulting in distinctly Chinese quality criteria. However, contrasting concerns and inaccuracies lead to contradictions in the "qualify" and "disqualify" binary logic and demonstrate inherent tensions and limitations in journal lists as policy tools.

1 | INTRODUCTION

Journal lists figure centrally in attempts to define "quality" in the research world (Pölönen et al., 2021). Some lists are trying to distinguish "good" from "bad" journals (Strinzel et al., 2019), sometimes functioning as a proxy to assess papers and their authors (Adams & Johnson, 2008). Journal lists have been established, evaluated, used, and debated by global users in scholarly publishing, including policymakers, research institutions, individual researchers, and commercial companies. However, these journal lists are contentious, regardless of their construction methodology, inclusion criteria, or intended use. For example, Jeffrey Beall's list of potential predatory journals and publishers evoked massive disputes about its potential bias and undesired effects, resulting in its withdrawal (Beall, 2015, 2017; Silver, 2017). Besides, there are conflicting categorizations in qualifying and disqualifying journals, for example as some journals are both in Beall's list and the Directory of Open Access Journals (Strinzel et al., 2019).

There are also attempts to define journal quality through journal lists in China (Huang et al., 2021). These lists are issued in the context of concerns about "quality"

in Chinese research policy. Specifically, fraud and paper-mills are increasingly exposed, threatening trust in Chinese science (Tang, 2019). In addition, low-quality open access journals are easy to publish in and hard to identify, by-passing Chinese government regulation through international publication channels. These developments strike at the heart of quantitative science evaluation systems, on which China heavily relied until recently, which are now struggling to differentiate researchers by counting publications or citations.

Our analysis focuses on the past two decades in China, with its remarkable ascent to the global science world and the concomitant search for an appropriate science policy model, to demonstrate how changing research policy concerns informed list development. This period ranges from the broad adoption of the Science Citation Index, up to the recent policy changes that aim to shift research evaluation and funding protocols from quantitative to more qualitative assessments (Zhang & Sivertsen, 2020). Making journal lists is currently seen as a means to fix both evaluation problems and publication fraud, caused by over-reliance on indicator-driven evaluation and the undesirable side-effects of open-access publishing. On the one hand, research organizations attempt to use discouraged journal lists[1] to disqualify journals, that is, to alert scientists and to dissuade them from publishing in "bad" journals. In contrast, science policies also employ journal endorsed lists to qualify journals for public resource allocation and to direct science toward national priorities. In addition, journals themselves also use "qualifying" journal lists to develop their reputation and attract resources.

This paper investigates the proliferation of journal lists in China and analyses the underlying values, quality criteria, and ranking principles used in these lists. What specific concerns drive the remarkable proliferation of journal lists in China? What criteria are used to construct lists in relation to these concerns? How are these criteria related to the envisaged uses of these lists? We will argue that these lists reflect specific Chinese policy needs and contain a paradox between generalized journal quality and quality for specific purposes.

The scope of this study is limited to STEM journals and new-coming lists of STEM journals that attempt to redefine quality through policy initiatives. This study takes a qualitative research approach, combining document analysis and semi-structured interviews. We studied and analyzed relevant policy documents and specific list-making initiatives, such as list-related science policies and national guidelines, list-making procedures and reports, list-making notices and their public announcements on webpages. We compiled a table to show the basic information of all the lists we researched (see Tables A1 and A2 in Appendix A). The document study was complemented by interviews with journal list makers to investigate the list-making process. It is almost impossible to get interviews through written interview invitations to list-makers or policymakers in China, so we had to use personal networks to get access, which may imply a bias. We successfully interviewed eight respondents online. Interviews were performed by Jing Wang in Chinese and were transcribed and coded by Jing Wang manually, for more details about the background of anonymized interviewees, see Appendix B.

The paper proceeds as follows: first, we provide an overview of the different list types developed internationally and their main issues of contention. Then, we develop a theoretical framework to understand the list-building logic in the context of research evaluation policies and the economics of publishing. The empirical part describes the logic of Chinese discouraged journal lists and endorsed journal lists, analyzing their contrasting quality criteria and intended uses. Finally, we reflect on the role of journal list construction in the Chinese research governance model and discuss the implications of our findings for Chinese list-building initiatives.

2 | JOURNAL LISTS AND JOURNAL VALUATION

2.1 | The journal lists debate

Various rankings, ratings, and lists of academic journals have been developed globally. From a formal, statistics perspective, the wide range of lists differs in terms of their ordering principles. We can categorize these lists into three groups, the nominal lists, the ordinal lists and the rational lists. The nominal lists typically simply label journals as "good" or "bad," to be encouraged or discouraged. Discouraged journal lists categorize journals as problematic, but do not explicitly order them from bad to worse. They typically use scoring criteria to qualify journals for a list (Hansoti et al., 2016; Shamseer et al., 2017). In contrast, ordinal lists do make explicit comparisons among journals and sort journals into different levels, in the form of simple journal rankings such as the Australian "A*, A, B, and C" ranks (Vanclay, 2011). Categorization may be informed by citation scores, but typically also allow for collegial expert judgment. Ration-based lists aim to score the included journals more precisely, typically based on algorithmic citation counts such as Clarivate's Journal Citation Reports (even though here too criteria-informed experts decide which journals to include in the count). The distinction may be complex, as some nominal journal rankings are generated from citation-based bibliometric criteria and could also be seen

as implicitly ordinal or rational lists, such as with lists using the Journal Impact Factor (JIF), CiteScore, or SCImago Journal Rank.

In the past two decades, the use of the JIF as a quality proxy has dominated research and journal assessment. The JIF has been taken as a handy and readily available tool in policymaking for resource and funding allocation, staff hiring and promotion, awards, and rewards (Lariviere & Sugimoto, 2019; Sugimoto & Larivière, 2018). This "off the shelf" indicator is uncritically embraced by numerous stakeholders in the light of its powerful ready availability and straightforward logic (Weingart, 2005), which has been subject of particularly extended debate. An ordinal list based on citations, the Journal Quartile, is also widely used, but its methodological flaws, such as uneven distribution of all fields' journals in different percentiles, produces misleading comparisons of journals and researchers (Leydesdorff, 2012). In response, alternative metrics have been developed that attempt to address some of these concerns. For instance, Elsevier's CiteScore supplies a basket of metrics that claims a more comprehensive, transparent and current picture of a journal's impact. Meanwhile, fake impact factors and misleading metrics have also appeared, such as the Global Impact Factor, launched by spurious companies to delude the research community and its evaluators (Jalalian, 2015).

Lists of endorsed and discouraged journals present themselves as a relatively simple and robust alternative to the methodological complexities and misrepresented precision of quantified journal quality indicators. These lists are typically developed for specific purposes, rather than a generalized "quality" assessment. Endorsed journals attempt to qualify research journals as reliable or legitimate. For example, the Directory of Open Access Journals (DOAJ, n.d.) presents a community-curated list of peer-reviewed open access journals assessed against quality standards, aiming to "increase the visibility, accessibility, reputation, usage and impact of quality, peer-reviewed, open access scholarly research journals globally" (DOAJ, n.d.).

Endorsed journal lists were also established to assess research, typically identifying high-quality journals as a mark of research excellence. An authoritative list of publication channels was created in Norway in 2005, connecting publication output to funding allocation. Denmark and Finland adopted this Norwegian model into their own evaluation frameworks subsequently (Pölönen et al., 2021). Similarly, the Excellence in Research for Australia (ERA) journal list is an integral part to support the ERA evaluation framework. These examples of evaluative lists contain relatively simple categorizations. The Norwegian list uses a system of first and second tier journals. The original Australian ERA list of 2008 ranked journals into four categories (A*, A, B, and C) (Vanclay, 2011), but since 2012, the undifferentiated list without hierarchical categories came into use (Haddow & Hammarfelt, 2019). Evaluative journal lists are not just developed by national government agencies. In the UK, there is a "Academic Journal Guide" initiated by the Association of Business Schools (ABS), which specifically ranks journals in the field of business and management with a 1, 2, 3, 4 rating, intended for research quality evaluation (Association of Business Schools, n.d.; Mingers & Willmott, 2013).

With these different uses, specific journal lists may also address specific users. For example, the DOAJ presents legitimate open access journals as an option for researchers and librarians (Morrison, 2017). To readers, journal lists may provide guidance on what deserves priority attention. The evaluative journal lists' primary users are policy makers, such as the Ministry of Education and Research for the Norwegian Register (Norwegian Centre for Research Data, 2019). In Italy and Spain, the local authoritative lists of publication channels are used in academic promotion of individual researchers (Pölönen et al., 2021). However, their use is generally not exclusive and they are therefore used as mediating devices between researchers, librarians, research managers, or policymakers.

In the counterparts of endorsed lists, lists of discouraged journals typically attempt to identify questionable, undesirable, or even predatory journals. Jeffery Beall, a librarian of the University of Colorado Denver in the United States, created Beall's list to identify and list predatory publishing channels abusing the open access model. The specific concern was to help librarians and scientists avoid exploitative and unreliable journals or publishers (Beall, 2017; Sorokowski et al., 2017). In 2020, the Russian Academy of Sciences created a list of deceptive journals to track unethical practices in research and publishing (Abalkina, 2021). Worries about questionable journals have even raised commercial attention: the Cabells company has made journal lists as commercial products, to offer the research community a guide to identifying reliable/unreliable sources and venues for publishing practices (Cabells Scholarly Analytic, n.d.; Strinzel et al., 2019).

Despite significant adjustments in recent years, journal listings still tend to be highly debated, both for the adequacy of their assessment and for their different side effects. Endorsed lists may have a huge influence on journals as well as the research community, not only in terms of how they affect reputation and research assessment, but also in terms of their reactive response. In order to ensure their publishing interests, journals may make efforts to meet the criteria set up by the list to prove their legitimacy. This may involve serious attempts to improve

the reliability or novelty of published research, but may also involve "gaming" of citation scores (Weingart, 2005). Researchers too may change their publication patterns in unintended ways in response to how journals are categorized by lists. For example, the "Academic Journal Guide" of the UK *Association of Business Schools* has been criticized for causing a kind of "journal list fetishism" (Hussain, 2015), as UK business school deans increasingly assessed staff by publications in best ranked journals, rather than by actual research performance. In addition, there is quantitative evidence (Rafols et al., 2012) to show that such a journal list has a systematic bias in favor of mono-disciplinary research and disadvantages interdisciplinary research in research evaluations. Among the alleged unintended consequences were the promotion of some types of research, stifling diversity, and constricting scholarly innovation (Hoepner & Unerman, 2012; Hussain, 2011; Irwin, 2019; Mingers & Willmott, 2013; Willmott, 2011).

The variation in criteria used in journal lists questions the correctness of their classification. For example, in spite of clarity suggested by the good-and-bad logic, some journals are in a gray zone between fraudulent and legitimate (Strinzel et al., 2019). For example, while some predatory journals are easily identified, it can be difficult to assess to what extent actual peer review occurs and the difference between predatory, questionable or low-quality journals may not be as clear as the binary logic of lists suggests. In addition, the open publishing model using Author Processing Charges (APC) has motivated publishers to publish a higher volume of articles to capture market share and reinforce their presence and control in the science market (Horton, 2016; Muellerleile, 2017). Major publishers have taken the mega-journal approach to lower the selectivity criteria among accepted articles and publish more. This results in an increasing market concentration toward these publishers (Zhang, Wei, Huang, & Sivertsen, 2022). In such a case, it is not an easy task to clearly categorize these "gray zone" publishing practices into predatory, questionable, or low-quality groups.

Labeling journals as "bad" also has considerable consequences for the journals in question: publishers may face revenue loss, or universities may risk damaged reputations if their researchers' output is labeled as fraudulent (Beall, 2017). While some discouraged journal lists do rank bad journals into different levels, the detailed quality differences among questionable journals are difficult to assess. It is hence not surprising that discouraged journal lists provoke fierce criticisms and opposition from both publishers and universities. Several controversial retraction cases involving various journals and publishers, for instance, the case of Scientometrics with Frontiers (Abramo et al., 2023; Zhang, 2023) and the case of Research Evaluation with MDPI (Retraction Watch, 2023), clearly showed that some publishers have strong objections to research investigating suspected predatory journals or lists labeling their journals as predatory. These studies may stigmatize these publishers' reputations, and in the end, publishers intervened to have their negative labeling rescinded.

In short, although sometimes presented as a more transparent and robust alternative, endorsed and discouraged journal lists have also raised discussion and produced dysfunctional effects. In their own particular ways, journal lists are confronted with the familiar complications of proxy quality measurement, limited contextuality, or gaming responses that require prudent and responsible use in research evaluation (Wouters et al., 2019). Theorizing the tensions involved can help us further here.

2.2 | Understanding the "list-building" paradox.

The establishment of a journal list is not simply a technical matter of a new journal metric, but must be considered in the wider context of research evaluation and publishing economics. List-building involves actors ascribing values to journals based on a set of evaluative criteria, organizing the ingredients to make and share the list, and establishing it as an authoritative evaluation resource, creating what Fochler has called a "regime of valuation" (Fochler, 2016; Fochler et al., 2016). In Fochler's argument, "regimes of valuation" represent the production and ascription of worth through moral and material infrastructures. List-makers similarly ascribe worth to journals through sets of implicit and explicit evaluative rules, grounded in discursive and institutional infrastructures. These involve policy discourses that articulate goals and values, as well as prior data infrastructures and institutions of research policy and management. In establishing this regime, the worth of journals is defined, assessed, distributed by different actors and ultimately "produced," that is, articulated in the specific terms of the regime, which presents a more objectified notion of "quality." The assessment process and its specific criteria are pushed to the background once the list is produced. The criteria become "technicalities" as the list suggests a more universal "quality" beyond a specific set of weighed and valued properties, or at least an adequate shorthand for such valued properties.

In addition, Dahler-Larsen's analysis of indicators' constitutive effects (Dahler-Larsen, 2014) further informs us about their relative and constitutive role in between the value they claim to measure and the effects they aim

to achieve. Journal lists offer interpretive keys to actors to draw attention, define discourse and orient actions in specific directions in such a regime. In this sense, successfully implemented lists do not simply "measure" quality, but come to *perform* quality.

Nevertheless, listing criteria are informed by pragmatic concerns of data availability, intended uses, and expectations about how lists will perform. As list building is limited by available data resources, ambiguities, what can be measured, and the inherent paradoxes of comparing the incomparable, the values of journals these indicators emphasize may not be the values articulated in policy or shared among scientists. Actors may comply with, resist to, or debate these regimes. To the extent that the regime is successfully deployed, it establishes its particular operationalization of "quality." However, this closure is only partial: it also leads to further reactions from actors involved, who will adapt, object, or even destabilize its performance of "quality." This is further complicated by the proliferation of lists, driven by specific policy concerns or even commercial concerns, that produce regimes of evaluation that are to larger or smaller degrees incoherent: national lists enter in a world where the IF, DOAJ, or Cabell list already exist in their own sociotechnical network (Helgesson, 2016). The building of evaluative regimes is therefore a dynamic and balancing process, in which journals are continually ascribed and deprived of different values in the various list-making processes. Not only does the valuation of a journal vary between such lists, but the multiplicity of lists also affords complex options for actors that work with them.

Metrics and criteria are the key devices that allow the transformation of a unique journal into a member of a set with similarly qualified other journals: list-makers use a set of proxy evaluative indicators to create commensuration among journals, resulting in the symbolic equivalence of the list. Commensuration is a fundamentally social phenomenon that assumes a common metric that can be used for measuring different characteristics in different units, which is to say, transform the qualities into quantities to make things comparable (Espeland & Stevens, 1998). Through this conversion, quantitative metrics become a legitimate expression of value, no matter how disparate the journals that are being commensurated. This leads to objections, such as the argument that citation potential and practices vary between fields, leading to reduced claims of commensuration ("only within the same field") or more complex commensuration efforts (such as field correlations). At the heart of commensuration lies a paradox of making equivalent what always also remains incomparable.

Ordinal or nominal lists avoid some of the distractions resulting from seemingly precise measurement, but essentially create similar equivalences, be it through classification. The logic of classification (Bowker & Star, 2000) is therefore also crucial to understand the list-building process. Journal lists sort out journals into different categories and standardize these categories in the listing infrastructure. The act of classifying requires decisions on what to include and what to exclude in a categorization (Stone, 1997). Categorizing is to set up a boundary in the form of rules or criteria, to single out dimensions that are worthy of attention. Journal characteristics that are valued in lists are the things that matter in the present scene, while the other value possibilities disappear or are backgrounded as they are referred to wishful "careful use" or "qualitative interpretation."

Lists set up new standards to evaluate research practices, and inevitably, actors who are evaluated will react to these measurements by altering and changing their performance. This is also what list makers expect: journal lists are made in order to inform choices, to encourage valued practices and dissuade others. However, the reaction to the list may not follow the spirit, but rather the letter of the implied instruction. That is, the quality criteria behind the lists may have a self-fulfilling effect that encourages actors (journals, researchers, research institutions, even science policies) to become more like what these lists measure (Espeland & Sauder, 2007). Even if evaluative resources such as lists may be presented as merely one instrument in evaluation, research organizations may use lists to simplify their allocation decisions, which can result in poor decisions and unintended consequences. Even though evaluative devices such as lists are presented as a valid measurement of "quality," actors are expected to accept their proxy status and not take them literally—an ambiguity that may get lost as these measurements come to fully perform "quality."

Because journal valuation lists are informed by specific criteria and measurements, based on specific concerns of valuation regimes, it is important to understand the key features of the regimes in which they function. In the case of Chinese journal lists, it is important to highlight the key role of the state in research evaluation, but also in scientific publishing. The scientific publication system in China is centrally planned and deployed as part of the research infrastructure, for details and explanation see J. Wang et al. (2021). Not only does public policy articulate priorities for areas in which journals should be stimulated, but public funding also requires principles to allocate resources that follow a bureaucratic, rather than a market competitive logic: the state and its delegated public organizations require decision rules to decide which journals to fund or to cut that cannot rely on the logic of business opportunities. This Chinese state-regulated publishing logic is different from the commercial logic of profit-oriented international publishers. For state policy, journal resource allocation is part of more encompassing policies to prioritize research fields

considered of national priority or policies to stimulate domestic research communication. These concerns are added to state policies addressing questionable publishing practice, fraudulent or trivial research, and waste of public funding on publications in foreign, questionable journals. Journal lists as an innovative way of journal evaluation in China therefore also have a solid orientation toward the state and its research policy concerns, as we will demonstrate in the results.

3 | EMPIRICAL FINDINGS

In this section, we analyze two sets of Chinese journal lists (see Appendix C): a set following the logic to discourage publishing in certain journals and one following the logic to encourage publishing. For every set, we describe their construction and policy context, how these are reflected in quality criteria used in the lists, and the intended and unintended uses of two sets of lists.

3.1 | Discouraged journal lists: Disqualifying journals

With a dramatic increase of paper retractions and paper mill issues exposed, the Ministry of Science and Technology (MOST) of China announced a crackdown on research misconduct. Making warning lists and blacklists of academic journals was an explicit part of this national policy (Cyranoski, 2018), sparking the development of national- and organizational-level lists of discouraged journals. We analyzed two national lists, generated by the national research agency; and eighteen research-institute lists, developed by hospitals and universities, largely addressing the medical field. Table 1 overviews basic characteristics of discouraged journal lists we investigate. It is worth mentioning that all the discouraged journal lists aim to label international journals with a Journal Impact Factor, that is: journals indexed in the Science Citation Index (SCI). For decades, journals included in the SCI were considered of high quality in Chinese research evaluation (Zhang & Sivertsen, 2020), hence apparently disqualifying journals was only considered worthwhile for SCI listed journals.

The MOST national initiative aimed to establish a publication warning mechanism that distinguished internal administrative and external, public uses. Hence two authoritative lists of discouraged journals were created: *the internal list* was generated by the Institute of Scientific and Technical Information of China (ISTIC), tasked by the MOST, with two warning levels: "blacklist" and "warning list"; In contrast, *the public list* was established by the National Science Library (NSLC), affiliated with the Chinese Academy of Sciences. The NSLC published its first version of the "Early Warning list of International Journals (Trail)" at the end of 2020, with updates at the end of 2021 and in early 2023 (CAS Library, n.d.), with three risk levels: high, medium, and low.

In response to policy initiatives aiming to improve research performance, a growing number of hospitals and universities started to establish institutional lists of discouraged journals since 2018. Some of these followed the NSLC list, but others were developed independently, covering specific research fields, as confirmed one of our informants (R1) and an official announcement of the Kunming University discouraged journal list (Wang, 2019). To produce this list, Kunming University used 20 discouraged journal lists built by universities and hospitals nationwide and disqualified 17 journals that appeared more than 5 times, demonstrating how lists inform other lists. Hospitals' and universities' lists are highly diverse, varying in number of journals, maintenance, organization, geographic location, field coverage, differentiation levels, transparency, or selectivity, reflecting specific valuative concerns.

Concerns over scientific misconduct increased with the rapid growth of Chinese research science output (Tollefson, 2018). As one respondent stated, "the increasing publications in predatory journals, paper mills, and publication fraud concern the science community of China, which trigger the need to identify and monitor suspect journals" (R1). Another respondent emphasized "the failure of some profit-oriented publishers to play the role of quality gatekeepers in the scientific publishing process" (R2). Similarly, national documents (Chinese Communist Party and the State Council, 2018; Ministry of Science and Technology, 2020) proposed to regularly publish warning lists and discouraged journal lists of poor reputation journals that prioritize profit over scientific quality. The stated purpose is to govern scientific integrity in China and contribute to an improved international academic publishing ecology.

However, list developers have to translate these state policy concerns into specific criteria. ISTIC's list uses three characteristics: the disproportionately high share of papers by Chinese authors, the abnormally high growth rate of publications, and quality control problems in reviewing. The interviewee (R2)-related other criteria that were used: the citations of the journal, the article processing charges (APC), and "negative public opinion" of journals involving paper mills, large-scale retractions, and image manipulation problems. The NSLC's list combined bibliometric indicators and the expert assessment (by consulting experts and a survey among scientists) to select risky journals with potential quality problems for "early warning" purposes. The quantitative part comprehensively evaluated seven indicators: journal publication volume, author internationalization, rejection rate, APC,

TABLE 1 Characteristics of discouraged journal lists in China.

	Warning blacklist	Early warning journal list	Negative journal lists
Organization	National agency	National research organization	8 Universities and 10 hospitals
Number of journals	91 journals	65 journals (2020) 35 journals (2021) 28 journals (2023)	7–60 journals
Research fields coverage	Multiple disciplines of STEM	Multiple disciplines of STEM	Most in medical, some cover multiple disciplines of STEM
Differentiation	Two warning levels	Three warning levels	Some lists with differentiated levels and some without
Transparency	Not open to the public	Open to the public	Some lists open to the public

an index of journal citation success, self-citation rates, and retraction information.

Among these criteria, the rate of Chinese authorship is remarkable. One informant (R1) explained that the Gini coefficient was used to capture the overall distribution of authorship across countries within Science Citation Index journals. An unusually high percentage (e.g., >90%) of papers by Chinese authors would make a journal suspicious. A study by Zhang et al. has confirmed this disadvantage of Chinese authorship to journals. They examined six official criteria (except rejection rate) and other related factors of NSLC's 2020 listed journals, and found that four key criteria: retraction rates, number of articles in the journal, the degree of Chinese authorship dominance in the international journal, and the rapid growth of APC expenditures from Chinese authors, were influential in descending order for journals to be listed as warning journals (Zhang, Wei, Sivertsen, & Huang, 2022).

In another example, APCs were considered in light of citation impact and rejection rates.

> "Even though *Nature* has an extremely high APC, it still qualifies because it has a high rejection rate, which means they did a large amount editorial work. However, some low-impact journals charge inappropriate high APCs without enough editorial work. This characteristic will be flagged as risky. (...) We produce this warning list for the Chinese research community only. Moreover, early warning journals are defined differently from predatory journals and there is no overlap between the list of early warning journals and the list of predatory journals." (R1)

The selection of specific criteria is informed by the lists' intended uses, based on the particular administrative functions which they are expected to perform. The NSLC's list is intended to remind Chinese researchers to choose their publication platforms carefully, and to prompt international publishers to strengthen journal quality management. It is not intended to disqualify the results published in these journals and is not meant for research evaluation purposes. To further illustrate this point, the 2021 NSLC list explained how the three descending warning levels had different intended uses (CAS Library, n.d.; Fenqubiao, 2021b). The high warning level aimed to contain academic misconduct, relying on retraction indicators; the medium warning level tried to facilitate the spreading of Chinese research results to the international academia and optimize efficiency of China's research funding by relying on author internationalization and APC indicators; while the low-level warning was designed to assist scientists' with publishing choices, for some journals are at risk of a plummeting IF, based on journal publication volumes. The interviewee was keen to emphasize that.

> "the blacklist is only applicable to the Chinese research community and the selection of criteria for the list was based on the reality of scientific publishing in China, and there may not be a corresponding demand in the US or European countries." (R1)

It seems that NSLC's list did have consequences outside of China, namely through its influence on international publishers and journals and the reactions this provoked. There are several changes in contrast with the lists of 2020, 2021, and 2023: many journals on the previous list were removed, while only a small number recurred; the number of warning journals decreased; and the research fields of some warning journals were adjusted (CAS Library, n.d.). We learned from our interview with the makers of the 2020 list, that international

publishers included in the list turned to the list-developing team for explanations and came up with pertinent improvements to their journals. For example, two of Wiley's listed journals implemented corrections and retractions, and assembled a new editor-in-chief and editorial team (Fenqubiao, 2021a). The NSLC's list even affected Clarivate's decision on journal inclusion: after the list was issued, two journals were removed from the Web of Science database, according to the post from NSLC list-building team's official Wechat account (Fenqubiao, 2021c). In addition, other studies (Petrou, 2021; Zhang, Wei, Huang, & Sivertsen, 2022; Zhang, Wei, Sivertsen, & Huang, 2022) show that the NSLC's list led to revenue loss for some journals and a rapid drop of publications from Chinese authors for some publishers after the 2020 list was released.

The intended uses of ISTIC's list are similar to the NSLC list: supporting publication choices, preventing the waste of funding money, and addressing misconduct issues. However, the difference is its managerial role, restricting this list's use to public administration. We learned from the interviews that ISTIC provides its list to China domestic research institutions to alert their administrative departments, a channel not open to the public. Through this non-disclosure, ISTIC hopes the list can perform its functions while preventing malicious commercial speculation and gaming, which would destroy its original usefulness. As the Respondent 2 stated,

> "the journal blacklist is only a means of monitoring and supervising the academic misconduct that exists in the academic publishing process and is not intended to stigmatize journals. Rather, we have established a blacklist system based on the reality of scientific publication in China. This system only uses quantitative means to monitor some problems that may exist in journals and select them out, such as the pursuit of economic interests by some journals at the expense of academic quality, which violates the principles of publication ethics and scientific integrity." (R2)

The (un)intended uses of these lists are also noteworthy. Even though there are solid reasons for building some discouraged journal lists, and some list-builders are subtly cautious about the risk of unanticipated consequences, the unintended uses are not always under control. For example, after NSLC published its 2020 warning list, MDPI made a series of official announcements to negotiate the list's criteria and a resolution claimed to improve journal quality. As a result, the number of MDPI journals decreased from 22 on the 2020 NSLC list to seven on the 2021 NSLC list. In brief, the authoritative discouraged lists are designed to encourage journals and publishers to improve quality, but such lists are not intended to make publishers change exactly according to the lists' criteria. Inconsistent criteria and intensions behind the list indeed question whether these can be entirely characterized as "unintended consequences" (Dahler-Larsen, 2014).

Unintended usage does not only occur among publishers. Two authoritative discouraged-list developers stressed that lists cannot be used in research evaluation, but at the institutional level, we noticed some copied these lists and used them for performance evaluation anyway: two of the hospitals under our investigation claimed to disqualify credits of publications in discouraged journals in research assessment performance.

The specific needs and problems of China's research publication system led to its own set of discouraged lists. However, even though discouraged lists are developed for specific purposes and with specific criteria, we can observe that these lists are reappropriated and even misappropriated out of these specific contexts. While some of the criteria are meaningful for specific uses, this creates varying classifications between organizational, national, and even international discouraged lists (such as Cabells) that raise tension and unanticipated negative consequences.

3.2 | Endorsed journal lists identifying "high-quality" journals

The endorsed journal lists in China provide administrative tools to implement national priorities and policy considerations via the quality criteria for journals, including special attention for domestic journals. In this section, we discuss two Chinese programs that generated two high-quality journal lists, the *Chinese STM Journal Excellence Action Plan* and the *High-quality STEM journals catalogue graded by field*. Each attempt has its particular purposes and different uses.

3.2.1 | *The Chinese STM Journal Excellence Action Plan* with a journal funding list

The *Chinese STM Journal Excellence Action Plan (2019–2023)* proposes the construction of world-class STM journals, which is another national policy goal following the construction of world-class universities and world-class disciplines (CAST, 2019b). The mission of this plan is to grant state financial support to domestic scientific journals to improve quality and bring them in line with world-leading journals. Although there is no explicit intention in this plan to formulate a list of high-quality journals, such a list was the result of the particular need to allocate public funding.

The Executive Office of the Excellence Action Plan announced the funding list of 285 shortlisted journal-related projects with a total funding of more than 200 million RMB in 2019. The list consists of five categories. The "leading journals" consist of 22 high-quality English journals from research fields considered a priority in China, with the aim to take them to the world top in 5 years' time through committed funding (1–5 million RMB). "Key journals" involve 29 English journals with support up to 1 million RMB for priority research domains with good editorial foundation and high potential to compete with internationally leading journals. "Echelon journals" comprise 99 English and 100 Chinese promising journals in basic research, engineering and popular science, with more modest funding. "New high-potential journals" are 30 journals that receive one-time starting grants to stimulate English journals in key national technological areas such as space or ocean research. And lastly "Clustering pilots" are assigned to five publishers with a pledged grant (2–6 million RMB), in order to aggregate journals into a publishing platform to attract global high-level research.

The list criteria therefore combine not only criteria of research excellence, but also their national/international orientation, and focuses on specific sectors of interest in technological development for China. In this program, excellence is largely assessed through field-specific quantitative metrics. One respondent connected to such a journal confirmed that quantitative criteria determined the weight for 70%–80% of the entire assessment process, and expert review for only 20%–30% (R3). The Excellence Action Plan for journals are mainly based on Science Citation Index indicators in the single research area (R4), although another interviewee (R5) suggested that expert-panel reviewers have a greater role to play. It also can be inferred from the yearly Blue Book on the Development of Chinese Science and Technology Journals (2020) that key quantitative criteria used in the plan consisted of the Journal Impact Factor, the published article volume, the Impact factor percentile of journals by discipline in the JCR (China Association for Science and Technology, 2020). Hence an international database provided quantitative information that was combined with expert judgment and concerns about national research priorities.

The use of the STM Excellence list varies among actors. First, several national government bodies use the list as a basis for funding allocations in developing the publishing system. Secondly, the use of the list also serves the needs of national science evaluations, as a governance tool in the Ministry of Science and Technology science policy. The 2020 policy correction of research evaluation relying on output of "Papers Only" (Ministry of Science and Technology, 2020) encouraged researchers to publish or present their most important works in "three types of high-quality publications," including "Domestic STM journals with international influence" which refers to the Excellence Action Plan list. With a call to abandon the sole reliance on the Journal Impact Factor and the number of papers in the research evaluation, the state bureaucracy perceived a need to establish new evaluative benchmarks. The Excellence Action Plan list facilitates this redefinition of quality, but returns to journals as proxies for quality of contributions. Thirdly, selected journals use this list to build reputations and attract attention and submissions as reflected in the advertisement of their Excellence Action Plan ranking on their website. Fourth, universities similarly use the list for boosting reputations, as they post the inclusion of their journals on their official website. Also, some university libraries use the list to identify "core journals" recommended to their faculty and staff.

In spite of the stated intent to abandon "Journal Impact Factor only" and "Paper-only" research evaluation, the use of the Excellence Action Plan and its criteria means the JIF and improving ranking percentile in the Journal Citation Report indirectly continues to dominate. The responses of our interviewees corroborate this. In addition, it was also confirmed in the expert review session of the Work Exchange Promotion Meeting for the China STM Journal Excellence Action Plan in April 2021, in which participating experts stressed how much the JIF increased under the Excellence Action Plan funding. Moreover, this persistence resonates with a cross-countries study (Kulczycki et al., 2022) showing that China's journal rankings are still JIF-based, and that top-tier journals explicitly refer to the first Impact Factor quartile (Q1). In the Excellence Action Plan, the funded top-tier journals mainly belong to China-owned journals in Q1. Nevertheless, the Excellence Action Plan more explicitly introduced national research priorities and—perhaps more importantly—also domestic publishing as priorities.

3.2.2 | The *High-Quality STEM Journals Catalogue:* Graded by field for evaluative reference

The *High-Quality STEM Journals Catalogue* was articulated as a task in the national policy to develop an evaluative reference for journal selection and research assessment for researchers and academic institutes. The China Association of Science and Technology (CAST) was tasked to guide and fund subordinated academic societies to establish lists of endorsed journals since 2019.

A specific set of considerations prompted this journal catalog project. The first was to define journal "quality" through peer review by learned societies. Second,

academic societies therefore needed to develop comprehensive and objective evaluation standards for journal quality levels. Third, the most important stated reason for this project was to let academic societies re-examine and re-assess the quality of domestic and international journals[2] in respective research fields, to establish an equivalent evaluation between domestic and international journals. Fourth, this journal catalog was expected to attract high-quality and high-impact papers (of Chinese researchers) to domestic scientific journals. With such purposes, domestic scientific journals were expected to enhance impact and discursive power in the international science community, which would in turn provide vital support to national innovation capabilities. Hence this journal catalog was designed to be an endorsed list for officially accrediting high-quality journals across each research field (CAST, 2019a).

Academic societies and associations affiliated with CAST were responsible for setting up inclusion criteria and fulfilling journal selection work through a combination of qualitative and quantitative evaluation of domestic journals in comparison with international ones. We could learn its basic procedure from CAST's official project program (see Figure 1). The catalog required three quality levels (Tier 1, 2, 3). T1 indicated journals close to or already at the quality of international first-class journals; T2 referred to internationally renowned journals; T3 journals represented high-level journals recognized by the fields' community. As for evaluative criteria, the disciplinary list making should assess journals' ability to grasp cutting-edge issues, journals' academic influence and power to define research agendas, editorial ability to converge and integrate international academic resources, brand building and marketing skills as essential indicators.

Respondents from academic societies (R6, R7, and R8) were optimistic and favorable about this project for the shared reason that the international journal evaluation system (implicitly referring to JIF, JCR, EI etc.) is inadequate for some Chinese research domains. They also expressed that it should be the academic societies' responsibility to define the "relevance and quality" of journals and hence rank journals. However, interpreting the program's criteria of "peer review, value-oriented, and same quality for equivalent use" (CAST, 2019a) generates ambiguities. When applying these fuzzy concepts to the practice of the respective research area, each society faced its peculiar problems. Respondent 6, from an academic engineering society, discussed the unclear scope of journal selection and evaluation. Their work team and expert committee struggled with the demarcation of a particular discipline, the types and range of journals, and the classification of journal categories during selection and assessment. Respondents from the

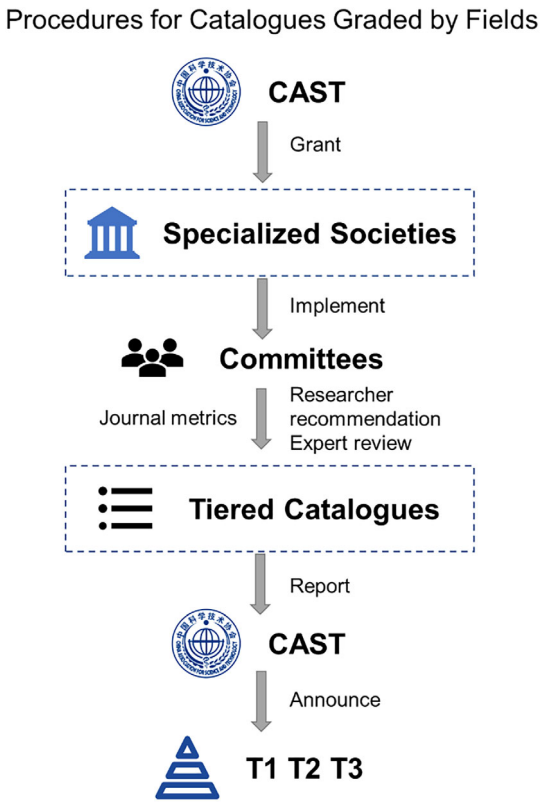

FIGURE 1 Basic procedures for high-quality journal catalogs graded by fields.

technology area and medicine, respectively, also expressed the same difficulties (R7, R8).

Except for the demarcation issues, some respondents (R6, R8) were puzzled about comparing the quality of international and domestic journals together and making the quality equivalence among the two journal groups. Therefore, the use of journal metrics, the definition of each tier, and the criteria of journal ratings varied across journal catalogs in different areas. Interestingly, several respondents (R6, R7) mentioned using the journal list of the *Excellence Action Plan* as one of the inclusion criteria for journal selection, as journals' presence on the *Excellence Action Plan* list was seen as an indicator of high quality. Faced with the ambiguities of criteria, professional judgment here referred to other endorsed lists, and indirectly also traditional citation measures.

How the outcomes of the *High-Quality Catalog* will be used remains unclear, as the development of various research area catalogs is still in progress. Nevertheless, one respondent (R8) from medicine shed light on how their disciplines' catalog was adopted by some medical institutions for use in academic evaluation: in some medical institutions, journals graded T1 in the medical catalog are considered equal to a journal impact factor of 3.0 for the purpose of researcher evaluation. Other respondents expected the governing bodies to implement their

catalogs to the science community in a top-down way. In addition, some journals now use this list to advertise their high quality, and the publisher MDPI has announced that 17 of its journals have been selected for inclusion in the CAST high-quality STEM journals catalog. These are indications that the disciplinary catalogs are beginning to define and perform journal quality indirectly, via career evaluation or journal promotion, but also that some actors still expect more directive implementation.

The analysis of the *High-Quality Catalog* has several implications. First, the development of this catalog emphasizes the peer review function of the academic societies as experts on journal quality, over the heavy reliance on the journal impact factor. However, the program design is perceived as lacking clarity and academic societies struggled with its ambivalences and application difficulties. Second, the project highlights the relevance of domestic scientific journals. The program design is intended to put numerous domestic scientific journals on the same level as international journals for use in academic evaluation, implying that Chinese researchers can get credited for publishing nationally. This required the establishment of equivalences between domestic and international quality levels, against the limitations of international indicators.

4 | DISCUSSION

The empirical investigations explored two kinds of journal list-building in Chinese science, that either "qualify" or "disqualify" journals. This sheds light on how Chinese policymakers and research organizations ascribe value to journals in light of their particular policy concerns, including flagging questionable journals, adequate funding allocation, accrediting journals, or reforming research evaluation in the context of national research policy goals. In this sense, the journal list acts as a governance instrument which has set up an institutional regime to define the discourses of "good" or "bad" journals with specific concerns and criteria, using the structuring state force to orient publishing and evaluation actions toward handling particular problems in the Chinese science context (Dahler-Larsen, 2014; Fochler et al., 2016).

As different journal lists reflect national concerns, list-building proceeds using criteria of specific Chinese relevance. Chinese journal lists cannot be easily generalized or compared to lists made in other countries. For example, the value of prioritizing local needs plays a significant role in both Chinese lists of discouraged journals and endorsed journals, as was perhaps most poignantly illustrated by the use of internationalization levels of Chinese authorship and APC costs as disqualifying criteria. Among the qualifying criteria, the policy goal to establish high-level domestic journals reflects specific concerns such as national research priorities. The question of public funding allocation for journals therefore requires specific information and considerations relevant to China's national science policy: what is a "good" journal depends on national priorities.

However, the categorization used in these lists can be contradictory, triggering calls for clarification or even more homogeneity. First, there is a conflicting categorization in the endorsed and discouraged logic. Criteria used by different actors to set up different lists are divergent, which leads to the problem that some journals are listed both in endorsed and discouraged lists. For example, the *International Journal of Energy Research* is both listed in the warning journal list of NSLC 2020, as well as in the high-quality scientific journal list of the Chinese Society for Electrical Engineering in Tier 2. This is perceived as an inaccuracy or contradiction of the "qualify" and "disqualify" binary logic. In addition, some journal quality dimensions are contentious, and they will be very difficult to categorize into a simple binary classification, such as peer review (Siler et al., 2021). Moreover, unsound methodology, lists composed with criteria of low validity, or problematic indicators may impede rather than facilitate quality. For example, the internationalization of authors as a criterion in the discouraged journal list-making may lead to potential negative consequences, as international journals could reduce their number of Chinese authors for fear of ending up on the discouraged list. Inversely, journals flagged by the discouraged list may counteract it by rejecting more papers from Chinese authors. While using retraction information as another criterion might disincentivise journals to issue retractions, even though this has been regarded as a responsible practice to correct errors in the scientific record.

Moreover, these lists present a tension with science policies intended to reduce over-reliance on quantitative output indicators such as the JIF. While in the journal list logic qualitative criteria can in principle displace quantitative assessment, the JIF continues to play a central role in journal assessment, which coordinates with findings from Kulczycki et al. (2022). In various assessment settings, the JIF reappears indirectly as a criterion to list journals. By re-appropriating journal lists developed for other purposes, or returning to the illusive clarity of a number to dissolve the ambiguity of "quality," quantitative output indicators continue to play a decisive role.

5 | CONCLUSION

This study contributes to the research on the complex and divergent criteria, motivations, and consequences of journal lists (Petrou, 2021; Zhang, Wei, Huang, & Sivertsen, 2022; Zhang, Wei, Sivertsen, & Huang, 2022).

Our analysis considers the new journal list initiatives in the Chinese science context, expressing its specific national needs and concerns. In our findings, we found a remarkable proliferation of journal lists, even within one state structure, but with inconsistencies and competition between different agencies making journal lists from different perspectives. In addition to the contrast with other national journal lists, this variety of lists highlights how varying science policy priorities and concerns are expressed in lists that all claim to express which journals are valued, and which not (Pölönen et al., 2021).

Theoretically, the journal list-making has several fundamental paradoxes resulting from problems of commensuration, categorization and reactivity. When journal lists play a role in the governance of publishing, the inherent tension between universally commensurate "quality" and specific incomparable "qualities" keeps returning in the vacillation between one universal list or multiple, specific lists. In a centralized state governance of science, one might expect a one-size-fits-all authoritative list to definitively classify the different quality levels of journals. However, a variety of concerns prompted the derivation of multiple journal lists in China, involving state agencies, professional organizations and research institutes, often for good, fit-for-purpose reasons. A one-size-fits-all list will not be able to address a variety of quality notions, as critics of the JIF have pointed out; but inversely, making too many lists also creates problems: with too much diversity and specificity, comparability among journal and research entities in general begins to crumble, inhibiting the promise of commensuration that lists provide. Lists have to be context-specific (country, discipline, concern) to make sense. However, they also have to transgress specific context to allow comparison, such as in the Chinese case for funding allocation purposes. This tension is similarly present in other national journal lists, a tension between contextuality and an attempt to transcend this contextuality, to compare the value of journals for different research governance aims (Haddow & Hammarfelt, 2019; Pölönen et al., 2021).

In addition, there is a more fundamental paradox in these lists that is harder to balance. For lists to work, they need to be adopted by users and influence their choices. However, some of these effects will inevitably involve unanticipated consequences. Researchers and research institutions will respond to lists, but might also game lists. This reactivity is an important issue for research measurement design considerations (Dahler-Larsen, 2014; Espeland & Sauder, 2007). Once journal lists are implemented, they affect journal valuation, but also appeal to responsible use and the monitoring of undesired consequences (Hussain, 2015; Rafols et al., 2012; Willmott, 2011). While lists aim to change how people value journals, they also lead to warnings against a "list fetish" or "list worship."

As opposed to the oligopoly of the big publishers internationally, China has its own way of publishing (Wang et al., 2021); accordingly, it has its own way of valuing journals. Journal lists are a part of the science evaluation and allocation infrastructure that aims to develop national research excellence, prioritizing specific research fields, and using journal funding as one instrument to promote these goals. This creates specific needs for criteria in the administrative logic of resource allocation, based on clear criteria and definitions of "quality" and less on profit optimization. The Chinese journal lists are an instrument that helps administrative bodies, outsiders to the academic community, to ascribe value to scientific journals and direct funding to journals in support of research policy goals. However, state agencies are not the only force attempting to define quality. Academic institutions also participate in establishing journal quality through journal lists. For research performing organizations, the lists allow the continued use of journals as proxy of research quality, used to assess individual and institutional performance, in the context of the state's resource allocation decisions. It is the diverse field of policy goals and actors that generates this remarkable proliferation of journal lists.

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CONFLICT OF INTEREST STATEMENT

We have no conflicts of interest to disclose.

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ENDNOTES

[1] There are a lot of names of the lists that disqualify 'bad' journals, such as the warning list, the negative list, the blacklist, etc. We will consistently call these lists the discouraged journal list. The counterpart to this is the lists that qualify or accredit 'good' journals, such as the excellent journal list and the high-quality journal list. We will uniformly name these lists as the endorsed journal list.

[2] In this study, "Chinese journals" and "domestic journals" refer to journals published by Chinese publishers or organizations, either in English or Chinese language. "International journals" or "international publishers" means journals are not published by Chinese publishers or organizations.

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APPENDIX A

TABLE A1 Chinese journal lists of endorsed and discouraged journals.

Endorsed journal list	Maintenance	Time period	Number of journals	Differentiation with journal levels and number of journals	Disciplines	Transparency	Related website
Chinese STM Journal Excellence Action Plan	A national project jointly implemented by seven ministries (China Association for Science and Technology, Ministry of Finance, Ministry of Education, Ministry of Science and Technology, General Administration of Press and Publication, Chinese Academy of Sciences and Chinese Academy of Engineering)	2019–2023	285 shortlisted journal-related projects	Leading journals 22, Key journals 29, Echelon journals 199, New high-potential journals 30 (annually update), Clustering pilots 5 publishers	Multiple disciplines, but each journal funding level prioritizes focus on some research areas	Open	https://www.cast.org.cn/art/2019/9/20/art_80_101814.html; https://www.cast.org.cn/art/2019/11/6/art_458_104750.html
High-Quality STEM Journals Catalogue graded by field	Funded by The Chinese Association for Science and Technology, implemented by different academic societies	Started on 2019, by December 16, 2022, 41 academic societies have completed the high-quality journal catalog in their fields	Different number of journals based on each academic society	Three Tiers of each field journal list in general	41 disciplinary journal lists	Open	https://www.cast.org.cn/art/2021/11/4/art_458_172461.html; https://www.cast.org.cn/art/2022/12/16/art_43_204853.html
Discouraged journal list	**Maintenance**	**Date**	**Number of journals**	**Differentiation with journal levels and number of journals**	**Disciplines**	**Transparency**	**Related website**
Warning blacklist	Institute of Scientific and Technical Information of China, Ministry of Science and Technology	2020	91	Blacklist 8, warning list 83	Multiple disciplines of STEM	Not open	
Early warning list of international journals	National Science Library, Chinese Academy of Sciences	2020, 2021, 2023	65 (2020), 35 (2021), 28 (2023)	High risk: 8 in 2020, 5 in 2021, and 6 in 2023; Medium risk: 28 in 2020, 15 in 2021, and 11 in 2023; Low risk: 29 in 2020, 15 in 2021, and 11 in 2023	Multiple disciplines of STEM	Open	https://earlywarning.fenqubiao.com/#/en/
Warning list of academic journals	Shanghai Ninth People's Hospital, School of Medicine, Shanghai Jiao Tong University	December 10, 2021	32	High risk 5, Medium risk 20, Low risk 7	Biomedical sciences	Open	http://www.qk.sjtu.edu.cn/jsjtuj/CN/news/news485.shtml
Warning list of SCI journals	Ruijin Hospital, School of Medicine, Shanghai Jiao Tong University	December 6, 2021	20	High risk 6, Medium risk 14	3 disciplines: medical science (16), biology (3), bioengineering (1)	Open	http://www.qk.sjtu.edu.cn/jsjtuj/CN/news/news485.shtml
Early warning list of international journals (same as NSLC's list)	Southwest University	November 15, 2021	65	High risk 8, Medium risk 28, Low risk 29		Open	http://kjc.swu.edu.cn/s/kjc/index1/20211115/4690886.html

(Continues)

TABLE A1 (Continued)

Discouraged journal list	Maintenance	Date	Number of journals	Differentiation with journal levels and number of journals	Disciplines	Transparency	Related website
SCI academic journal alert	Huazhong Agricultural University, College of Food Science and Technology	October 19, 2021	59	High risk 6, Medium risk 28, Low risk 25	9 disciplines: material science (4), geoscience (2), engineering technology (12), chemistry (5), environmental Science and Ecology (2), computer science (1), agriculture and forestry science (1), Biology (6), medical science (26)	Open	https://shipin.hzau.edu.cn/info/1018/6514.htm
Early warning SCI journal list	Zhongda Hospital, Southeast University	August 17, 2021, Dynamic update	34	High risk 6, Medium risk 21, Low risk 7	Biomedical sciences, Engineering technology	Open, Publishing channel, official WeChat account	https://mp.weixin.qq.com/s/aOsNh12OvsGQcPBr6ZkM8Q
The first batch of early warning journal list	Nanjing University of Chinese Medicine	April 22, 2021	7	no	Biomedical sciences	Open	https://jcyxy.njucm.edu.cn/2021/0426/c4436a73481/page.htm
The first batch of international journal warning list	The Second Xiangya Hospital of Central South University	April 2021 (published date), Start using at May 1st, 2021, Dynamic update	57	High risk 6, Medium risk 27, Low risk 24	Biomedical sciences, Engineering technology	Not open, cannot find the original official announcement	https://www.medsci.cn/article/show_article.do?id=94fc213066e3
List of Key Monitoring and Warning Journals (First Batch)	Xuzhou Medical University	April 6, 2021, Dynamic update (this version updated on January 1, 2021)	35	no	Biomedical sciences, Engineering technology	Open, On the official website	https://yjs.xzhmu.edu.cn/info/1028/4783.htm; https://hqc.xzhmu.edu.cn/info/1030/2030.htm
List of Early Warning Journals (First Batch)	The First Affiliated Hospital of Soochow University	March 31, 2021	7	no	Biomedical sciences, multidisciplinary (1 scientific reports)	Open, on the official website	https://fyy.sdfyy.cn/Article/detail/id/81464.html
List of warning journals	The First Hospital of Jilin University	March 3, 2021 (updated), December 2020 (first issue), before NSLC's lists	45 of 2020, 43 of 2021, (Two journals had been kicked out of SCIE)	Decreasing degree of warning according to the order of journal list	Biomedical sciences and multidisciplinary journals (scientific reports and PLoS One)	Open	The content has been removed from their official Wechat account
Warning List of International Journals (First Batch), Same content as the NSLC list	The First Affiliated Hospital of Henan University of Chinese Medicine	January 22, 2021	65	High risk 8, Medium risk 28, Low risk 29		Open, On the official website	https://www.hnzhy.com/SubjectNewsDetail-972.html

TABLE A1 (Continued)

Discouraged journal list	Maintenance	Date	Number of journals	Differentiation with journal levels and number of journals	Disciplines	Transparency	Related website
List of journals that will not be encouraged and supported by funding	The First Affiliated Hospital of Sun Yat-sen University	November 20, 2020	37	No	Biomedical and multidisciplinary journals (scientific reports and PLoS One)	Not open	
List of journals not recommended for submission	The First Affiliated Hospital of College of Medicine, Zhejiang University	August 30, 2020	8	No	Biomedical sciences	Not open	
Blacklist and warning list of journals	South China University of Technology	2020, Before NSLC's list	27	Blacklist 5, Warning list 22	Biomedical sciences, Engineering technology, material science	Not open	
Blacklist of journals	Kunming University	2019	17	Ranking order based on the times have been blacklisted by more than 5 institutions	Biomedical and multidisciplinary journals (scientific reports and PLoS One)	Unknown	
List of "Key Monitor" Journals	Hefei University of Technology	January 4, 2019	60	No	STEM	Not open	
Blacklist of SCI journals for submission	Huaqiao University	October 31, 2018	18	SCI journals have been suppressed by Web of Science, Self type and Stacking type		Open	https://lib.hqu.edu.cn/info/1147/2060.htm
Negative list of journals	The Obstetrics and Gynecology Hospital of Fudan University	May 16, 2018	7	No	Medical science	Open	https://mp.weixin.qq.com/s/qp5DChX55iVV0Osfj_aWpg

TABLE A2 Early warning list of international journals (National Science Library, Chinese Academy of Sciences).

Field	Journal title	Warning level
The 2020 list		
Materials Science	Metals	Low
	Coatings	Low
	Materials	Low
	Journal of Nanoscience and Nanotechnology	Low
GeoSciences	Minerals	Low
	Atmosphere	Low
Engineering	Artificial Cells Nanomedicine and Biotechnology	High
	Advances in Civil Engineering	Medium
	International Journal of Energy Research	Medium
	Mathematical Problems in Engineering	Medium
	Sensors	Low
	Energies	Low
	Applied Sciences-Basel	Low
	Polymers	Low
	Electronics	Low
	Processes	Low
	Complexity	Low
	Desalination and Water Treatment	Low
Chemistry	International Journal of Electrochemical Science	Medium
	Catalysts	Low
	Molecules	Low
	Natural Product Research	Low
	Zeitschrift Fur Kristallographie-New Crystal Structures	Low
Environment Science and Ecology	Sustainability	Medium
	Water	Low
Computer Science	IEEE Access	Medium
Agricultural and Forestry Science	Agronomy-Basel	Low
Biology	Journal of Cellular Biochemistry	High
	Journal of Cellular Physiology	Medium
	Bioscience Reports	Medium
	Biomed Research International	Medium
	Biofactors	Low
	Plants-Basel	Low
	Cells	Low
Mathematics	Boundary Value Problems	High
	Advances in Difference Equations	High
	Journal of Inequalities and Applications	Medium
	Mathematics	Low
Medicine	European Review for Medical and Pharmacological Sciences	High
	International Journal of Clinical and Experimental Pathology	High
	Medicine	High
	International Journal of Clinical and Experimental Medicine	High

TABLE A2 (Continued)

Field	Journal title	Warning level
	Biomedicine & Pharmacotherapy	Medium
	Experimental and Molecular Pathology	Medium
	Brazilian Journal of Medical and Biological Research	Medium
	Cancer Biomarkers	Medium
	International Journal of Immunopathology and Pharmacology	Medium
	Oncology Research	Medium
	American Journal of Cancer Research	Medium
	Medical Science Monitor	Medium
	Oncology Letters	Medium
	Experimental and Therapeutic Medicine	Medium
	OncoTargets and Therapy	Medium
	Oncology Reports	Medium
	Molecular Medicine Reports	Medium
	International Journal of Molecular Medicine	Medium
	Journal of International Medical Research	Medium
	American Journal of Translational Research	Medium
	Journal of Biomaterials and Tissue Engineering	Medium
	Aging-US	Medium
	Life Sciences	Low
	Journal of Clinical Medicine	Low
	International Journal of Environmental Research and Public Health	Low
	Acta Medica Mediterranea	Low
Multidisciplinary Science	Symmetry-Basel	Low
The 2021 list		
Engineering	Complexity	Medium
	Shock and Vibration	Medium
	Advances in Civil Engineering	Medium
	Biomedicines	Low
Computer Science	Microprocessors and Microsystems	High
	Scientific Programming	Low
Biology	BioFactors	High
	Mitochondrial DNA Part B-Resources	Medium
	Frontiers in Molecular Biosciences	Low
	Frontiers in Cell and Developmental Biology	Low
	Life-Basel	Low
	Biology-Basel	Low
Mathematics	Discrete Dynamics in Nature and Society	Medium
	AIMS Mathematics	Low
	Journal of Mathematics	Low
Medicine	Pharmazie	High
	Molecular Therapy-Nucleic Acids	High
	Experimental and Molecular Pathology	High

(Continues)

TABLE A2 (Continued)

Field	Journal title	Warning level
	Journal of Cellular and Molecular Medicine	Medium
	Molecular Medicine Reports	Medium
	Journal of International Medical Research	Medium
	Journal of Cancer	Medium
	Medical Science Monitor	Medium
	Aging-US	Medium
	OncoTargets and Therapy	Medium
	Cancer Management and Research	Medium
	Cancer Cell International	Medium
	World Journal of Clinical Cases	Medium
	Annals of Palliative Medicine	Low
	International Journal of General Medicine	Low
	Frontiers in Medicine	Low
	Journal of Personalized Medicine	Low
	Healthcare	Low
	Diagnostics	Low
	Vaccines	Low
The 2023 list		
Materials Science	Textile Research Journal	Medium
GeoSciences	Geofluids	Medium
	Frontiers in Earth Science	Low
Engineering	Journal of Industrial and Management Optimization	Medium
	Mathematical Problems in Engineering	Medium
	Aerospace	Low
	Buildings	Low
	Computational and Mathematical Methods in Medicine	Low
	Energy Reports	Low
	Machines	Low
Chemistry	Inorganic and Nano-Metal Chemistry	High
	Journal of Structural Chemistry	High
	International Journal of Electrochemical Science	Medium
Environment Science and Ecology	Frontiers in Environmental Science	Low
Computer Science	Microprocessors and Microsystems	High
	International Journal of Control Automation and Systems	Medium
	Mobile Information Systems	Low
Economics	Economic Research-Ekonomska Istrazivanja	Low
Agricultural and Forestry Science	Food Science and Technology	Low
Medicine	Journal of Environmental and Public Health	High
	Pharmazie	High
	Psychiatria Danubina	High
	Acta Medica Mediterranea	Medium
	American Journal of Translational Research	Medium

TABLE A2 (Continued)

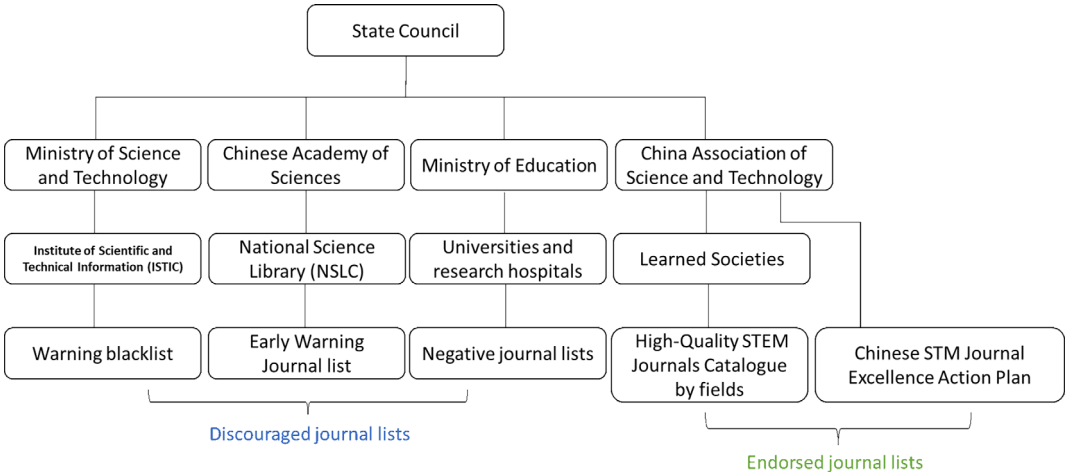
Field	Journal title	Warning level
	Journal of Biomaterials and Tissue Engineering	Medium
	Journal of Clinical Laboratory Analysis	Medium
	World Journal of Clinical Cases	Medium
	Frontiers in Surgery	Low

Note: The journal highlighted in green has been listed twice.

APPENDIX B: Profiles of respondents.

ID	Identity	Research field	Length of interview (min)	Date
Respondent 1	List-maker (Bibliometrician and policymaker)	Scientometrics and Research Evaluation	86	March 3, 2021
Respondent 2	List-maker (Bibliometrician, policymaker, civil servant)	Scientometrics and Information Evaluation	99	March 9, 2021
Respondent 3	Editor and researcher, participated in journal selection of the list	Chemistry	93	October 28, 2020
Respondent 4	Editor and publisher, participated in journal selection of the list	Photonics and Laser sciences	86	November 11, 2020
Respondent 5	Editor and publisher, participated in journal selection of the list	Medical sciences	78	December 15, 2020
Respondent 6	List-maker (Editor)	Mechanical Engineering	78	March 29, 2021
Respondent 7	List-maker (Editor and Researcher)	Aeronautics and Astronautics	61	April 24, 2021
Respondent 8	List-maker (Editor and Researcher)	Traditional Chinese medicine	53	May 11, 2021

APPENDIX C: Administrative relations of list-making agencies.



Note: This graph shows the journal list initiatives we investigated in our research, which is not the full picture of journal lists or rankings in China.