Illuminating the Hidden Forces Shaping the Public Face of Discovery Science

Abstract

Scientific discoveries attain public significance through institutional processes that determine which questions receive resources, which findings are promoted, and whose interpretations gain authority. This conceptual essay critically synthesizes scholarship on cumulative advantage, research funding, science communication, and epistemic justice to examine these processes. It contends that the public visibility of discovery science arises from interconnected decisions across funding organizations, universities, news organizations, and policy institutions. The essay develops a framework of visibility governance that distinguishes resource allocation, institutional selection, public framing, and the potential conversion of recognition into subsequent advantage. Evidence from grant competitions, biomedical funding disparities, academic press releases, and science news supports individual mechanisms, though the complete feedback relationship remains open to empirical investigation. The analysis differentiates legitimate research prioritization from unjustified exclusion and avoids conflating publicity with scientific quality or public benefit. This contribution links communication practices to the institutional conditions that enable research and make it publicly recognizable. It advocates for transparent selection criteria, attention to overlooked research, independent scrutiny, and meaningful participation in agenda formation as complementary approaches to accountability. A more inclusive scientific public sphere requires examination of how research becomes visible, in addition to reliable communication of research findings.

Keywords: *discovery science, science communication, research funding, cumulative advantage, epistemic justice, visibility governance*

Discovery Science and the Allocation of Public Attention

Scientific discoveries rarely enter public consciousness solely because of merit. Their visibility is shaped by a series of judgments regarding what warrants investigation, financial support, publication, promotion, and public interpretation. These judgments determine which achievements are recognized as scientific progress and which remain excluded from sustained public discussion. Consequently, public attention constitutes a significant object of scientific governance (Macnaghten & Chilvers, 2014). Understanding its allocation requires examining the institutional decisions that confer prominence, credibility, and claims to collective significance upon specific findings.

In this context, discovery science refers to inquiry aimed at generating new knowledge, including exploratory and basic research with uncertain applications. This inherent uncertainty presents a fundamental evaluative challenge: institutions must assess the potential of investigations whose significance may surpass established evaluative categories. Luukkonen (2012), in an analysis of European Research Council peer review, demonstrates how existing knowledge and reviewers' interpretive practices constrain the assessment of potentially groundbreaking proposals. As a result, research opportunities are influenced by how institutions structure judgments under conditions of uncertainty. The processes governing discovery commence prior to the communication of results.

The process of selection persists as research enters public circulation. Lehmkuhl and Promies (2020) analyzed journalistic attention in relation to a dataset of over eight million scientific publications, revealing the pronounced selectivity with which studies and journals are featured in news coverage. Their analysis renders the allocation of attention empirically measurable, rather than viewing publicity as a mere byproduct of publication. Concurrently,

Hess's (2016) concept of undone science highlights research relevant to mobilized publics and industrial transition movements that remains systematically neglected. Viewed holistically, these perspectives indicate that public absence can occur at multiple stages: significant questions may lack investigative support, and completed investigations may receive minimal public attention. These distinct forms of absence necessitate different explanations and interventions.

Existing scholarship offers substantial analyses of research selection, neglected inquiry, and mediated visibility. The central unresolved issue is how to connect these processes without conflating their distinct mechanisms or exaggerating their causal relationships. Evidence that a topic receives journalistic attention does not necessarily demonstrate that such coverage redirects funding. For instance, Leidecker-Sandmann et al. (2023) identify correlations between topic selection in journalism and scientific publishing but emphasize that parallel judgments of relevance may explain this correspondence. Their findings underscore the importance of distinguishing institutional interdependence from proven causal influence. A robust account must clarify where decisions intersect, what is transmitted between them, and what evidence would demonstrate that one selection process influences another.

The analytical gap addressed in this essay concerns specifying the transitions through which research opportunities are transformed into publicly authorized accounts of significance. Analyzing funding, promotion, and journalism in isolation may obscure the ways in which judgments traverse organizational boundaries. For example, a grant award may serve as a promotional credential, a promoted finding may become a preferred journalistic source, and public recognition may subsequently influence institutional assessments of achievement. These relationships are hypotheses for investigation rather than a uniform sequence present throughout

science. Their significance lies in the possibility that decisions justified for one context acquire authority in another without further scrutiny.

This conceptual exploration introduces visibility governance as a model for analyzing these transitions: the distributed institutional practices by which research is resourced, selected for public presentation, interpreted, and potentially reused as evidence of achievement. Through a critical synthesis of scholarship on research evaluation, science communication, and neglected knowledge, the essay poses the following questions: How do institutional selection practices determine which discoveries become publicly significant, and what responsibilities arise from this influence? The analysis distinguishes four key moments: resource assignment, institutional promotion, public interpretation, and evaluative reuse, and specifies the types of evidence required to trace relationships among them.

The central argument asserts that visibility governance shapes epistemic opportunity, one that comprises the ability to formulate researchable problems, secure investigative support, and introduce findings into relevant public deliberation. This argument does not equate unequal attention with injustice. Concentrated support may be warranted by urgent needs, evidentiary strength, or infrastructure requirements; limited coverage alone does not constitute exclusion or harm. Instead, accountability requires institutions to justify their selections, assess their cumulative effects, and allow substantive challenges to the criteria they use. The essay contributes by linking the public representation of discovery to the institutional conditions enabling it, situating responsibility within the decisions that fund, communicate, and recognize scientific significance.

Conceptual Approach and Scholarly Contribution

This inquiry is a critical conceptual essay, not a systematic review or original empirical study. In fact, it brings selected theoretical and empirical publications into dialogue to clarify mechanisms linking research support and public representation. The literature is employed for analytical relevance, with particular emphasis on studies that identify concrete decision processes or distinguish alternative explanations. No comprehensive database search, exhaustive corpus, or quantitative synthesis is claimed. On top of that, the examples serve to establish the plausibility and significance of specific mechanisms, rather than to measure their prevalence across all scientific systems.

The analysis differentiates among three types of statements: empirical findings, which describe what a cited study establishes within its design and population; interpretive propositions, which identify relationships suggested by synthesizing different studies; and normative recommendations, which address how institutions should justify and revise their practices. Maintaining these distinctions is essential because evidence that grant awards reproduce advantage does not independently demonstrate that media coverage caused that advantage. By the same token, evidence of exaggerated press releases does not establish that institutions systematically select inappropriate research for promotion. Relatedly, these related questions require distinct forms of observation.

Cumulative advantage provides the first conceptual foundation. Merton's (1968) account addresses the unequal recognition of contributions associated with established versus less recognized scientists. Applied to the current issue, it raises the question of whether reputational standing influences whose work is readily identified as significant. Furthermore, the relevant extension is organizational in the sense that an institution's capacity to prepare compelling public

materials and secure repeated recognition may become an additional factor shaping the dissemination of its researchers' work. In other words, this organizational extension is presented here as an analytical hypothesis, rather than as a finding already demonstrated by Merton.

Transparently, agenda setting and framing constitute the second conceptual foundation. By way of illustration, McCombs and Shaw (1972) investigated the relationship between media emphasis and the perceived importance of political issues. In similar vein, Entman (1993) elucidated how communication selects certain aspects of an issue and highlights interpretations. These concepts help distinguish two questions regarding science: which discoveries enter sustained public discussion, and how those discoveries are characterized once included. As such, a report may accurately summarize a study while situating it within a limited narrative of progress. Conversely, a socially neglected issue may receive prominent coverage that oversimplifies or misrepresents its evidence. Thus, representation encompasses both distributive and interpretive dimensions.

In line with the reasoning expanded above, it stands to reason that epistemic justice adds a normative question about whose knowledge receives consideration. For instance, Fricker (2007) distinguishes injustices involving credibility judgments from those involving unequal access to shared interpretive resources. In a bid to this differentiation, it appeared to be intelligible that the relevance to research governance is not that every unsuccessful grant or unreported paper constitutes epistemic injustice. Quite the contrary, patterns of exclusion warrant examination when social identity or institutional position systematically affects whose questions appear credible or intelligible (Wynne, 1992). Plainly speaking, a fair communication system must consider both the distribution of interpretive authority and the circulation of technically accurate information.

Precisely, these perspectives support a four-part account of visibility governance. To quantify in brief, resource allocation affects which inquiries can proceed, and institutional selection affects which completed findings receive promotional support. Moreover, public framing, according to Capano (2023), influences how findings are interpreted and which sources are authorized to explain them. On parallel track, evaluative reuse occurs when publicity or recognition enters subsequent judgments about research value. The last relationship can produce a feedback process, but it should not be assumed whenever funding and visibility coincide. Its identification requires tracing the actual use of public recognition in later decisions.

This account extends the existing scholarship in a specific, bounded way by treating the transitions between organizational decisions as objects of analysis, beyond treating funding and communication as separate domains. Moreover, it also separates the legitimate need to select from the obligation to justify selection. Finally, it directs reform toward the institutional point at which exclusion occurs. Improving a press release cannot correct an inaccessible grant competition, and increasing research funding cannot ensure that public accounts represent uncertainty adequately. In the last analysis, accountability requires matching an intervention to the mechanism it can plausibly change.

Funding Priorities and Institutional Authority

Arguably, funding shapes discovery science before public communication begins. Decisions about program scope, eligibility, allowable costs, grant duration, and assessment criteria determine which projects can compete and which approaches appear feasible. On top of that, government agencies and philanthropic organizations necessarily establish priorities, implying they cannot support every worthwhile proposal (Murray, 2013). Hence, the problem is not the existence of priorities but the relationship between those priorities, their public

justification, and the opportunities available to challenge them. In essence, treating all funders as interchangeable obscures differences in mandate, governance, and responsibility.

Deeper dive leads to a disclosure that public agencies operate within political and administrative arrangements that define their missions and budgets. Beyond that, philanthropic organizations exercise discretion grounded in private resources and organizational purposes. In fact, both can support socially valuable research, and both can establish restrictive agendas. Their legitimacy, however, cannot be evaluated by an identical standard (Prewitt et al., 2006). To this end, a public research program must explain its relationship to public purposes and accountable decision processes. A private foundation that substantially influences a public research agenda must also confront questions about representation and contestability that documenting its generosity alone cannot answer. By way of illustration, Harman's (2016) analysis of the Bill and Melinda Gates Foundation provides a useful basis for this distinction. Her concern is the legitimacy of authority derived from private wealth within global health governance. Adding on to that, classifying philanthropic activity as either beneficial or harmful does not resolve the issue since contributions to health objectives and authority over collective priorities are analytically different matters. Building on that distinction, this inquiry asks who can question a research agenda, what evidence can alter it, and whether communities affected by its decisions have meaningful influence. To be truthful, these questions apply even when a funder supports valuable scientific work.

As it happens, a focused philanthropic mission is not itself evidence of improper exclusion since a foundation dedicated to infectious disease research need not support particle physics to demonstrate legitimacy. Along the way, a stronger critique examines choices within the relevant mission and the broader consequences of dependence on a limited group of funders.

For example, an assessment could compare how alternative health problems are represented in calls for proposals, who participates in setting priorities, and whether unsuccessful approaches have credible routes to reconsideration (Chubb & Reed, 2018). Significantly, such analysis is more defensible than inferring arbitrary control from the mere existence of a specialized funding portfolio. Moreover, funding arrangements can also affect the kinds of uncertainty researchers can sustain. In subsequent validation of such arrangements, Azoulay et al. (2011) compare academic life scientists supported through the Howard Hughes Medical Institute with matched researchers funded through National Institutes of Health mechanisms. In all actuality, their analysis linked an arrangement offering greater freedom and tolerance for early failure to more exploratory and influential research outcomes, meaning the comparison does not establish that private funding is universally superior to public funding. To make more compelling its intended thrust, it stresses that the design of support, including time horizons and flexibility, deserves attention alongside the amount awarded.

It bears repeating that this finding complicates a simple account in which funding inevitably disciplines researchers into conformity. Some funding arrangements can expand the capacity to pursue uncertain directions. At this juncture, the practical question is which forms of accountability preserve that capacity while allowing funders to assess responsible use of resources. For instance, a project that changes direction may reflect productive learning rather than failure to comply (Fortunato et al., 2018). On the flip side, indefinite support without meaningful assessment can protect unproductive arrangements. In parallel, the appropriate balance depends on the kind of inquiry and the consequences of error, not on a uniform preference for flexibility or control.

Crucially, cumulative advantage introduces a different concern. In a bid to shine a light on this, Bol et al. (2018) examined early-career funding in the Netherlands using applicants located near a grant-award threshold. Those just above the threshold subsequently accumulated more than twice the funding of those just below it over eight years, despite similar initial review scores. Essentially, the study provides stronger evidence than a simple correlation between reputation and success because its design compares closely ranked applicants around a consequential decision. Its results, in all honesty, support scrutiny of whether an early award becomes an advantage. To be more specific, these applicants do not show that publicity explains the later difference. It goes without saying that the implication for visibility governance is a testable extension. When institutions publicize grant winners as especially authoritative researchers, the distinction between receiving resources and possessing exceptional merit may become less visible to audiences. In the words of Laufer and Jones (2021), a funding decision can then acquire a public narrative that exceeds what the original comparison warrants. Establishing this relationship empirically would require examining institutional announcements and later evaluative decisions. The concern is not that award winners lack merit; it is that public accounts may erase the uncertainty and close comparisons involved in selection.

Concentrated funding also requires an evidentiary justification appropriate to the research activity. In tandem with this mode of justification, Fortin and Currie (2013) examine grant support and bibliometric impact among Canadian researchers and found diminishing returns across the measures they studied. Their findings challenge a general presumption that concentrating resources always maximizes scientific impact. Phrased differently, they cannot be generalized to every infrastructure-intensive project or treated as a complete measure of social benefit. At the heart of this line of inquiry is an understanding that they nevertheless support

asking whether a proposed concentration serves a demonstrated research need or merely reproduces an established preference for already prominent investigators.

Institutional Communication and the Selection of Discoveries

Universities and research organizations translate scientific work into public accounts through press offices, institutional websites, events, and expert commentary. These activities can make difficult research accessible and help journalists locate reliable sources. They also involve selection, and communication staff must decide which studies warrant attention, which researchers will speak, and which anticipated benefits will organize the message. These choices occur within organizations that have reputational interests, but reputational interest alone does not demonstrate distortion (Cullerton, 2024). It is safe to say that the relevant task is to identify where institutional objectives alter the evidentiary content or distribution of communication. In similar vein, Peters (2013) describes scientists' media relations as shaped by both scientific norms and organizational expectations. Often, his synthesis complicates the image of a simple divide between researchers and journalists. According to Metag (2021), scientists often value public visibility, while universities encourage engagement and scientific communities maintain expectations about appropriate communication, implying that this institutional setting makes the press release a consequential intermediary. There is no escaping the fact that it carries research beyond specialist publication while also presenting the institution's preferred account of why the research matters.

In the wake of the growing involvement of various seen and unseen vectors of interest influencing funding decisions regarding discovery science, Sumner et al. (2014) provide direct evidence of this intermediary role in that their study compared 462 health-related press releases issued by 20 leading United Kingdom universities with the associated papers and 668 news

stories. More pointedly, exaggeration in press releases was associated with exaggeration in subsequent reporting, including stronger causal claims and inappropriate extensions from animal research to humans. The design was observational, so the association should not be treated as proof that press releases independently caused every distortion. Nevertheless, the study shows why explanations that locate exaggeration exclusively in journalism are inadequate. Furthermore, an institutional announcement does more than shorten a paper as it establishes a hierarchy of relevance by choosing a headline, foregrounding outcomes, and identifying the significance that an audience should retain. If preliminary evidence is described primarily through the promise of an eventual treatment, the distance between the observed result and the proposed application can become difficult to see (Wang, 2018). This is an interpretive problem even when the underlying observation is correctly reported. The audience needs to distinguish what the study found from what the institution hopes the finding might enable.

In the light of institution's role in reshaping a terrain of funding decision about projects pertaining to discovery science, it is important to know that accuracy and representativeness must be evaluated separately. An institution could publish entirely accurate releases while repeatedly selecting studies from a narrow range of laboratories. As a measure of pushback, a diverse selection of studies could still communicate uncertainty poorly. The first problem concerns the distribution of promotional support; the second concerns fidelity to evidence (Cohen, 2008). An effective audit would compare the institution's research output with its promotional output, then examine how it described the promoted work. On this point, raw counts alone would be insufficient because different studies have different relevance to audiences because the distinction also clarifies how to evaluate neglected research. In the last analysis, the crux of the matter is a study's absence from a university news page does not establish

suppression. At other times, it may have reached practitioners through a specialist association, a local partnership, or a policy workshop. Here what becomes reasonable to do is assess visibility relative to the audience and purpose since a technically complex result can have high value for a small professional community without attracting national coverage (Mitchell, 2009). The appropriate question is whether the people who could use, question, or be affected by the research have a reasonable opportunity to encounter it.

Research communication should also preserve the contributions that enable discovery. An account focused exclusively on a principal investigator or a single dramatic finding can understate the roles of technical staff, collaborative infrastructure, prior studies, and unsuccessful approaches. The recommendation here is not to add exhaustive acknowledgments to every public message. Instead, avoid an account of achievement that systematically treats discovery as the work of isolated individuals. Showing how a result depends on collective and cumulative effort can improve public understanding while making institutional credit claims easier to assess. Additionally, these considerations suggest a communication responsibility that goes beyond publicity. Institutions should be able to explain why they promoted a finding, why they framed its claims as they did, and how audiences can inspect the underlying evidence. Put another way, that responsibility is especially relevant when promotional materials are reused across organizational channels with little additional scrutiny. The credibility attached to an institutional source should increase the obligation to communicate evidentiary limits, not replace it.

Media Framing and Policy Attention

Most notably, news organizations shape the public interpretation of science through their selection practices. Going still further, their responsibilities include assessing relevance, checking claims, and locating findings within ongoing public concerns. They are not simply

distribution channels for institutional messages, and more than that, journalists can investigate promotional claims, seek independent expertise, or make neglected problems visible. At the same time, the availability of prepared materials and familiar sources can shape what becomes practicable to report. Institutional communication and journalism therefore interact without becoming the same activity.

To put this in a slightly different form, framing is unavoidable because any account selects what to explain since the analytical concern is which interpretations dominate and which relevant alternatives remain hard to articulate. Describing a research program as a competitive race foregrounds speed and national standing; describing it as a public health intervention foregrounds effectiveness, distribution, and implementation. Neither description necessarily falsifies scientific findings, but each directs attention toward different standards of success. It is hardly a stretch to see that Entman's (1993) account helps explain why factual accuracy cannot fully evaluate a public scientific narrative. Pivoting sharply, Nisbet et al. (2003) examine the development of the stem cell controversy through agenda-building and frame-building processes involving sources and journalists. Their analysis, in large part, provides a more defensible example of institutional and political mediation than a general assertion that attention automatically produces research support. Interestingly, scientific developments enter public debates through negotiations over ethical meaning, policy choices, and political authority. As such, public prominence may bring opposition and constraint as well as endorsement. Consequently, the relationship between visibility and institutional advantage is contingent on how a field is framed and which actors mobilize around it.

In one sense, the distinction is also apparent in pandemic communication. Delving deeper into the issue at hand, Hart et al. (2020) analyze politicization and polarization in United States

COVID-19 news coverage. Their study highlights how political actors and partisan differences enter accounts of a scientific and public health issue. As this line of inquiry unfolds further, it does not establish that a particular simplified vaccine statistic caused hesitancy, nor does it compare every neglected pandemic topic with every prominent one. Relatedly, its relevance bleeds into how the public meaning of scientific developments can be organized through political conflict rather than through evidentiary considerations alone.

Most typically, policy institutions influence visibility when hearings, program announcements, and public debates designate research questions as matters of collective concern. Such attention may respond to real needs and help secure necessary investigation. Even more importantly, it can also narrow the terms on which alternatives become discussable. When narrowly defined, the analytical task is to examine the criteria of relevance rather than presume that political attention corrupts science. Publicly funded inquiry, in a bold move, cannot avoid public purposes, and disagreement over those purposes cannot be resolved solely by scientific expertise. For all these reasons, Sarewitz and Pielke's (2007) distinction between scientific supply and societal demand is useful here. A compelling account of future benefit does not establish that a particular research portfolio is the best route to that benefit. Decision makers also need information about implementation conditions, affected populations, and alternative interventions. Applied to communication, this means an announcement of discovery should not carry an unsupported inference about social improvement. The connection between the result and the promised benefit must itself be explained and assessed.

The term "the public" also requires care because patients, residents, teachers, industry specialists, and policymakers may need different information from the same research. National media prominence is therefore an incomplete indicator of public usefulness. A research program

might be widely celebrated while remaining inaccessible to the people who must interpret its practical consequences. In opposition to this, local communication can have substantial value without creating measurable national attention. Assessing visibility requires identifying whose needs and questions define the relevant public, rather than treating aggregate exposure as a sufficient goal.

Unequal Opportunities to Shape Research Agendas

The distribution of funding and recognition may intersect with inequalities in who participates in research. Ginther et al. (2011) found that Black applicants were less likely than White applicants to receive NIH research awards even after accounting for several measured characteristics. The finding concerns a specified funding system and period; it does not establish an identical pattern across every research context. It does, however, show why formal openness of competition cannot be assumed to guarantee equal opportunity. Assessment must examine outcomes and mechanisms, including disadvantages that conventional measures miss. To proceed along similar lines, Hoppe et al. (2019) examined research topic choice as one contributor to the funding gap. They found that Black applicants more frequently proposed work in topic areas with lower award rates, including community- and population-oriented research. Topic choice explained only part of the disparity; therefore, the study should not be read as attributing researchers' responsibility for choosing the wrong questions. To be precise, its relevance rests on valuing research topics having unequal consequences for groups whose scholarly interests are distributed distinctly across topics. On closer examination, it appears that Lauer et al. (2021) offer an important qualification by examining differences among NIH institutes and centers. Their analysis indicated that assignment to institutes and centers with different award rates explained much of the lower funding associated with specific topics. This

interpretation redirects attention from an exclusive focus on reviewer preferences toward the institutional distribution of funding opportunities. Reading the studies together prevents a simplistic explanation in which one identifiable decision maker accounts for the entire disparity. Research inequity can arise through interactions among topic selection, organizational assignment, and available resources.

For visibility governance, this evidence raises a further question rather than supplying a completed answer. If some topics receive less funding, their associated communities and problems may have fewer opportunities to generate findings that later enter public discussion. Whether that occurs in a particular setting must be investigated through linked funding and communication records. This proposition matters because public absence may begin before a press office or journalist encounters a finished study. An account limited to media representation could overlook this earlier point of exclusion as resonant with Fricker's (2007) framework that helps clarify the ethical stakes. In effect, institutions can distribute attention in ways that affect whose inputs are treated as credible and whose experiences inform the categories through which problems are understood. Applied here, this implies that participation should include opportunities to shape questions, not simply invitations to receive findings. However, participation is not a substitute for evidentiary assessment because a just research process must combine responsiveness to relevant experience with transparent standards for testing claims and explaining disagreement.

In proposing a way forward, citation-based assessment creates another possible difficulty. Wang et al. (2017) found that research characterized by novel combinations of previous knowledge could have delayed recognition and patterns of impact that conventional short-term indicators poorly capture. Even more so, their study concerns bibliometric evaluation rather than

public media attention. It nevertheless cautions against treating rapid recognition as a universal proxy for value. When evaluation rewards immediate visibility, it may disadvantage work whose importance takes longer to become legible, including research that crosses established disciplinary categories. In this endeavor, this concern does not justify replacing scientific judgment with an automatic preference for obscurity or novelty. Unrecognized research can be weak, and celebrated research can be excellent. Said another way, the relevant obligation is to keep evaluative criteria open to examination. Reviewers and institutional leaders should explain why particular measures are appropriate to the research being assessed and identify what those measures omit. Otherwise, an indicator designed for one purpose can gain authority over decisions it was never meant to resolve.

Accountability Across Funding and Communication

To take this claim further, reform ought to address specific decisions rather than give equal attention to all research. Four principles follow from the analysis: reasons for selection should be accessible; descriptions should preserve the strength and limits of evidence; affected communities should have opportunities to influence relevant priorities; and evaluative systems should remain open to revision. These are proposed standards for organizational accountability. Their application will differ across research fields, and their effectiveness should be assessed rather than assumed. More pointedly, funding organizations should publish intelligible explanations of program priorities and examine them at the portfolio level. Individual proposals may be competently assessed while the overall distribution of support leaves important needs unaddressed. In a micro sense, portfolio review should examine variation in award rates, patterns of repeated success, and the consequences of eligibility requirements. Where disparities appear, analysis should distinguish among application patterns, review outcomes, organizational

assignment, and budget constraints. This method avoids attributing every disparity to a single source while retaining responsibility for investigating it.

Suffice it to say that universities should establish editorial criteria that separate a study's public relevance from its anticipated promotional value. A press release should identify the research design, the population or material studied, important limitations, and the distance between a result and a proposed application. It was long thought that institutional claims about significance should be recognizable as interpretations. And selection audits need to also consider whether communication resources repeatedly favor the same laboratories or topics. The aim is a reasoned distribution of communication support, with space for research whose importance does not fit a dramatic discovery narrative. Treading along similar lines, journalists and institutional communicators should retain separate roles even when they collaborate. Access to scientists and interpretive materials can support good reporting, but independent assessment is still necessary. A journalist should be able to seek an unaffiliated expert, inspect the paper, and question the institution's account of significance. Likewise, communication staff need organizational permission to preserve uncertainty when a more assertive headline might appear attractive. These protections make accuracy a property of the communication process rather than a matter of individual restraint alone.

Open access can support scrutiny, but it is not equivalent to equitable visibility. Willinsky (2006) grounds access in the public value of extending the circulation of scholarship. Empirical evidence also supports distinguishing access from conventional recognition: Davis (2011) found increased readership under randomized open-access conditions without a corresponding citation advantage during the study period. The implication is that broader availability can serve audiences whose engagement is not captured by citations. Assessments should therefore consider

whether intended users can obtain and understand research rather than if citation counts exhaust its public reach.

Access commitments also require workable infrastructure. Tedersoo et al. (2021) documented disciplinary differences in data sharing and restrictions in obtaining data described as available upon request. For the sake of accountability, a statement of availability is weaker than a functioning route to inspection. Institutions should support appropriate repositories, documentation, and clear reuse conditions. Privacy, consent, and other legitimate restrictions may limit openness; institutions should explain those limits. The objective is meaningful scrutiny, with access arrangements suited to the evidence and people involved. Participation should begin while consequential choices remain open. Slicing through this assumption, Stilgoe et al. (2013) organize responsible innovation around anticipation, reflexivity, inclusion, and responsiveness. Viewed from a vantage point of visibility governance, these commitments require institutions to consider whose concerns are absent, examine their own assumptions, involve relevant publics, and show how input can change decisions. Drilling deeper, consultation that occurs only after priorities have been finalized offers limited influence. A credible process should document both changes made and reasons for declining proposals, so participation does not become another form of institutional promotion.

Emerging evidence tentatively suggests that evaluating these reforms should avoid making attention itself the sole measure of success. More coverage is not necessarily better if it misrepresents uncertainty or concentrates authority, and appropriate indicators might include the range of sources consulted, the accessibility of evidence, the correction of misleading claims, and documented changes following public input. In that respect, these indicators would not be

combined into a universal score in that their purpose would be to make specific commitments inspectable while preserving room for qualitative judgment about scientific and social value.

Limitations and Directions for Empirical Research

The proposed framework joins studies with different units of analysis, including individual applicants, funding programs, press releases, and news coverage. These studies cannot be treated as a single dataset. Much of the evidence also concerns biomedical research and institutions in relatively well-resourced national systems. Applying the framework to other disciplines, countries, or community research settings necessitates examining their funding arrangements, communication practices, and public relationships. Historical findings show mechanisms, not every present-day institutional practice. The central empirical task is to trace relationships across decision stages. A study could link a defined cohort of research outputs to grant histories, institutional promotion, news coverage, and subsequent evaluations. Interviews and documentary records would be needed to establish why decisions were made and whether visibility affected later support. Comparisons should account for research quality, topic, institutional resources, and relevant audience needs. Otherwise, greater funding and greater attention could reflect a common cause rather than a reinforcing relationship.

The account also permits disconfirmation. If comparable studies receive promotional support independently of institutional prestige, that will weaken a prestige-based explanation in that setting. If publicity does not enter subsequent assessment or funding decisions, the proposed feedback relationship would not be established there. Research should also identify cases in which independent journalism, public criticism, or alternative funding interrupts accumulated advantage. Such comparisons would explain the conditions under which visibility governance reproduces hierarchy and those under which it broadens participation. A useful empirical design

would distinguish visibility from approval. Counts of news items could indicate exposure, but the articles themselves would need to be coded for endorsement, criticism, uncertainty, and the range of sources consulted. Funding announcements should likewise be distinguished from reporting about substantive findings. Without those distinctions, an institution criticized for overstatement could appear more successful than an institution whose work received less but more informative coverage. Public attention is a relationship between content and audiences, not an undifferentiated quantity that can be read directly from mentions.

Selection also needs an explicit denominator. Studying only promoted results would reveal how selected work is presented but would not establish why other work was omitted. A stronger design would begin with a defined set of eligible outputs and compare promoted and unpromoted studies. Interviews could then examine whether decisions reflected evidentiary quality, audience relevance, staff capacity, funder expectations, or assumptions about newsworthiness. The unit of comparison should remain stable so that differences among disciplines or institutions are not mistaken for the effects of promotion itself. The normative assessment would require additional evidence regarding consequences. A difference in coverage becomes an accountability concern when it consistently restricts relevant opportunities, obscures consequential uncertainty, or prevents affected groups from contesting decisions. These consequences cannot be inferred from an uneven distribution alone. Researchers should examine whether the omitted work reached appropriate audiences through other routes and whether those audiences considered existing access adequate. This combination of comparative records and situated interpretation would connect institutional practices to the people whose opportunities they shape.

Finally, a prospective evaluation could assess a change in institutional messaging policy against a comparable period or organization. Outcomes should include evidentiary accuracy and audience usefulness alongside the distribution of attention. If a wider selection of studies improves representation yet overwhelms communication capacity, the intervention may demand additional resources rather than abandonment. If selection criteria change on paper but promotional patterns stay unchanged, interviews and workflow records could identify where implementation failed. Evaluating reforms in this way would keep the framework accountable to apparent institutional behavior.

Conclusion

The public face of discovery science emerges through institutional decisions that precede, accompany, and follow the announcement of a finding. Funding makes some inquiries possible, organizational communication selects some results for promotion, and media and policy processes shape their interpretation. Evidence from these domains establishes important mechanisms of selection and unequal opportunity. It does not justify treating every prominent discovery as a manufactured success or every neglected topic as deliberately excluded. A credible critique must preserve those distinctions. This essay's contribution is to organize those mechanisms as visibility governance and to locate accountability at the transitions between them. The framework broadens accounts of cumulative advantage and public framing by asking how resource decisions become public claims of significance, and whether those claims subsequently acquire evaluative authority. It also makes clear that the complete feedback process remains an empirical question. Its value lies in specifying relationships to investigate and responsibilities that improving publicity alone cannot discharge. A more accountable scientific public sphere requires institutions to explain their priorities, communicate evidentiary limits, and allow

relevant communities to contest the terms of inclusion. Access to published results is necessary, but participation in defining research questions and interpreting their consequences matters as well. The goal is not uniform attention across all science. It is a defensible distribution of opportunities to investigate consequential problems and to have the resulting knowledge considered. Scientific communication fulfills that goal when it makes both discoveries and the institutional judgments surrounding them available for reasoned scrutiny.

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