

# The Illusion of Objectivity: How Systematic Reviews in Psychiatry Increasingly Reproduce Existing Power Structures and Pharmaceutical Models — Is Karl Popper Relevant?

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## Abstract

Systematic reviews and meta-analyses are regarded as the highest form of evidence in modern science. However, within psychiatry, they often rest on a foundation marked by structural and methodological bias. These biases stem in part from databases such as PubMed, Embase, and Web of Science, which prioritise high-impact journals with close ties to the pharmaceutical industry. This results in the selection of studies that disproportionately support pharmaceutical models. Sponsored research, in particular, dominates the published landscape and receives excessive weight in reviews and meta-analyses, reinforcing existing power structures and cementing biomedical paradigms.

This article argues for the need for a fundamental rethinking of review methodology, inspired by Karl Popper's principles of falsification. Such an approach would promote critical testing rather than the accumulation of confirmatory evidence and ensure greater pluralism in knowledge synthesis. The article presents proposals for a new methodology, revised database strategies, and strengthened requirements for conflict-of-interest declarations as pathways to restoring integrity and critical reflection in psychiatric reviews.

## Introduction

Karl Popper played a crucial role in the scientific legitimization of psychology at a time when both psychology and psychiatry were embedded in a self-

reinforcing psychoanalytic theory of the human mind. Today, we are in a similar situation, though it is no longer psychoanalysis that holds the psychiatric diagnostic system and research hostage, but rather the medical and pharmacological model. This situation makes the world-renowned philosopher of science Karl Popper relevant once again. Popper was a strong critic of the metatheoretical framework of psychoanalysis, which was in no way verifiable. He presented his critique of psychoanalysis in 1934 in *Logik der Forschung: Zur Erkenntnistheorie der modernen Naturwissenschaft* [1], but his ideas only gained broader influence in the post-war period—especially from the 1950s onwards—as his philosophy of science became more widely known. Popper's views began to gain traction in philosophical circles and among philosophers of science. In the 1950s, his critique was often highlighted in debates about what distinguishes science from pseudoscience. Yet Popper is not only relevant in debates about science versus pseudoscience—he can also contribute to methodological considerations that can be implemented in reviews, based on the principle that “The criterion of the scientific status of a theory is its falsifiability, or refutability, or testability” [2]. This principle should also apply when we work to create an overarching picture through reviews.

Systematic reviews and meta-analyses are regarded today as the gold standard of evidence synthesis and are considered to represent the highest level of evidence for guiding clinical decisions and developing practice guidelines. However, these methods often rest on a foundation marked by significant bias, both as a result of methodological choices and structural distortions in the databases used for literature searches. Behind these challenges lie deeper problems linked to economic interests—particularly industry-sponsored studies and other industry-generated biases—that collectively have distorted psychiatric research to such a degree that producing scientifically robust reviews has become increasingly difficult.

Literature reviews play a crucial role in providing an overview of research fields and interdisciplinary connections. They serve as an important tool for synthesizing research findings, documenting evidence at the meta level and identifying areas where further research is needed—an essential part of developing theoretical frameworks and conceptual models.

Comprehensive guidelines already exist for conducting literature reviews, describing different types of reviews, including narrative and integrative reviews [3,4] systematic reviews and meta-analyses [5-7] and integrative reviews [8]

Naturally, avoiding bias is central to all research, and various tools and standards have been developed with the aim of reducing it. Among these are Grading of Recommendations, Assessment, Development and Evaluation (GRADE) [9] and the Cochrane Risk of Bias Tool [10].

Nevertheless, the methods used in systematic reviews and meta-analyses are often based on searches in databases such as PubMed, Embase, PsycINFO, and Web of Science. These databases were developed to facilitate access to scientific literature, but their structure and selection criteria contain inherent biases. Search strategies thus tend to favour studies published in high-impact journals, English-language publications, and research from high-income countries<sup>11,12</sup>. These priorities do not necessarily reflect scientific quality but often rather prestige, network structures, and commercial interests that shape the publication system.

“There has been a marked shift from research being conducted in public institutions and academic settings to industry increasingly taking over the organisation of clinical trials in the past decade. At present, most trials are funded by industry. (...) Studies show that industry-sponsored research is strongly associated with results favouring the experimental therapy, raising concerns about sponsorship bias and quality issues in the

outcomes of clinical trials” [13].

The same article points out that 64% of senior editorial board members received payments from the pharmaceutical industry between 2013 and 2016 [13]. Furthermore, a more recent study has identified significant undeclared financial conflicts of interest among the top 10 recipients of payments in leading psychiatric journals. These findings highlight potential risks to the transparency and integrity of research. Further research is needed to assess the effectiveness of disclosure policies and to develop mechanisms to mitigate conflicts of interest in psychiatric research [14].

Problems with payments from the pharmaceutical industry are also seen among researchers. A new study shows that it is especially the most prominent psychiatrists who receive the largest share of the funds—amounting to \$357,971,774 [15].

Studies document extensive financial ties between peer reviewers and the pharmaceutical industry [16-17], enabling the industry to exert significant control over publications in international journals. These studies also highlight that journals’ reliance on self-declaration means undisclosed conflicts of interest often remain hidden [16-17]. This gives the pharmaceutical industry considerable influence over what is published.

Even in the development of the DSM, clear connections to the pharmaceutical industry are evident. A study of the 170 members of the DSM-IV panel found that 56% had one or more financial ties to the pharmaceutical industry<sup>18</sup>. Among the members who worked on the criteria for depression and schizophrenia, all had financial ties to industry, and for anxiety and eating disorders, the figure was 80%. Of the 20 members who developed the clinical guidelines for DSM-IV, 18 (90%) had at least one financial tie to industry.

The most common types of conflicts of interest

included:

- 77.7% received research funding,
- 72.2% engaged in consultancy work for the industry,
- 44.4% sat on boards of pharmaceutical companies,
- 44.4% participated in industry-funded studies [19].

For DSM-5, approximately 68% of the working group members reported ties to the pharmaceutical industry, representing a 20% increase compared to the DSM-IV panel [19, 20] (Cosgrove, 2009; 2010). A more recent analysis showed that around 60% of DSM-5-TR panel members received payments from the industry [21]. Even the U.S. FDA’s drug approval process has been documented as influenced by industry [22].

“Academic medical institutions are increasingly dependent on industry. Some institutions have entered into partnerships with pharmaceutical companies to establish research centres and training programmes where students and faculty members effectively carry out the industry’s research. The concept of ‘technology transfer’ became part of the vocabulary in 1980 with the adoption of federal legislation that encouraged academic institutions receiving public funds to patent and license new inventions and share royalties with the researchers” [23].

The pharmaceutical industry’s influence on the DSM has led to the lowering of criteria for many diagnoses. On one hand, this has caused a dramatic increase in the use of psychotropic medications; on the other hand, it has made psychiatric diagnoses more difficult to apply in scientific contexts. The diagnoses today overlap much more than before, and the normal range is gradually disappearing [13-32].

One of the greatest problems in modern research is sponsored research. This could be addressed if the funds that the pharmaceutical industry currently uses for sponsored research were instead channelled through public research institutions, which could distribute the

funds to independent research free from industry influence.

Sponsored research consistently yields results that are more favourable to the pharmaceutical industry than those seen in independent research. Since the majority of published articles today originate from sponsored research, the bias in the scientific literature is therefore significant. It is — unsurprisingly — well documented that financial support from the pharmaceutical industry affects many aspects of the design, execution, and reporting of drug trials and often leads to conclusions favourable to the sponsor. Studies have shown that industry-sponsored reports are up to five times more likely to favour the company's product compared to independently published data [33-42]. Furthermore, studies suggest that up to 75% of all health science research is sponsored by the pharmaceutical industry [41-48].

For this reason, sponsored research should be weighted in a way that reflects this distorting effect — for example, at no more than one-fifth the weight of independent research. If we account for the fact that some researchers fail to declare their income from the pharmaceutical industry, the weighting of sponsored research should be even lower. Sponsored research should not be entirely excluded, as good and valuable studies also exist among these.

When we examine the methods used to reduce bias in reviews, it becomes clear that modern approaches — despite good intentions — are often associated with significant problems. A review can broadly be described as a more or less systematic method for collecting and synthesising prior research [40]. By integrating results and perspectives from many empirical studies, a review can shed light on and answer research questions with a strength that no single study can achieve. In addition, reviews can help reassess conclusions from individual studies that may be flawed because they do not build on

results from other studies or adjacent research areas.

The problem is that the methods implicitly favour research findings and articles that are frequently repeated or cited. This could in principle strengthen the evidence base if repetition reflected independent replication and genuine consensus. But particularly within psychiatry, where sponsored research dominates the published literature [47], the picture is distorted. In such cases, it is often industry-funded studies that are repeated, cited most frequently, and included in guidelines<sup>31</sup>. This creates a self-reinforcing effect, where sponsored research gains disproportionate weight in reviews and meta-analyses, which on the surface appear systematic and objective. In practice, this means that the conclusions of these syntheses risk resting heavily on a distorted evidence base, where bias is hidden by the structure of the method [11].

This structural favouring of certain types of research contributes to cementing pharmaceutical and diagnostic models that instead ought to be subjected to critical scrutiny. At the same time, the likelihood that alternative or independent research findings will achieve real impact in the scientific synthesis is reduced [12].

In this way, a protective ring has been drawn around the entire psychiatric field — both in terms of research and treatment — which in academic contexts means that we must set clear and firm demands for reform. Only in this way can we once again establish the foundation for scientifically robust investigations. A natural place to begin this work is to reconsider how we approach reviews under current conditions — if it is possible at all.

The challenges we face today are largely due to the influence of the pharmaceutical industry, but also to bias arising from other causes within research. Together, these factors have created a research landscape where independent and critical knowledge struggles to break through — with major implications for how we design

and write reviews.

### Structural Bias in Databases

Databases such as PubMed, Embase, PsycINFO, and Web of Science prioritise studies published in high-impact journals. These journals often have close ties to industry — either directly through funding or indirectly via advertising models, sponsored supplements, etc. Studies from low- and middle-income countries, non-English-language publications, or independent research environments are similarly underrepresented. This means that the evidence base for a review is already shaped by systematic bias from the outset. To address these biases, sponsored research should at minimum be weighted 1/5 relative to non-sponsored research. Whether this weighting is applied may depend on the specific articles selected for the review.

### Citation Bias and Self-Reinforcing Research

Reviews that emphasise citation frequency risk reproducing dominant narratives rather than challenging them. Sponsored studies are cited more frequently — both because they are more actively distributed and because they appear in guidelines and consensus reports shaped by the same structures.

### Publication Bias and the Invisible Material

Reviews are typically based on published data, but many neutral or negative studies remain unpublished (the file drawer problem). This is particularly well-documented in psychiatric research, where published and unpublished results often differ [46].

### Bias in Search Strategy

Even systematic reviews reflect subjective choices: which databases, search terms, and inclusion/exclusion criteria are used. These choices are rarely transparent enough for precise replication and can mask bias in selection itself.

### Sponsorship Bias in the Review Process

Many so-called systematic reviews receive support from stakeholders with an interest in the conclusions — including the pharmaceutical industry. Sponsorship bias can influence everything from the research question to data interpretation.

### The Superficial Objectivity of the Method

The systematic method creates an illusion of objectivity through standardised search strategies and protocols. But the method does not protect against the bias embedded in the structural distortions of the research landscape.

### Exclusion of Alternative Forms of Knowledge

Reviews often overlook qualitative studies, case reports, ethnographic analyses, and historical perspectives that could provide a more nuanced understanding of psychiatric phenomena. This contributes to an artificial consensus around biomedical models.

### Search Engines, Databases, and Bias in Different Types of Reviews

The choice of literature in reviews increasingly depends on databases whose structural priorities have significant consequences:

- **Narrative reviews:** The risk of selection and confirmation bias is reinforced as unstructured searches are often guided by visibility rather than relevance [7, 2, 4].
- **Integrative reviews:** Database biases undermine the potential for interdisciplinarity, as qualitative studies, small-scale studies, and negative findings are difficult to identify [21].



- **Systematic reviews:** These amplify database and publication bias, creating a false sense of robustness because the method appears objective while bias shifts from author to system [7].

- **Meta-analyses:** These inherit all the above biases and amplify them by quantifying effect sizes [48], giving structural distortions and sponsorship bias maximum impact.

Altogether, the use of databases creates a hidden selection structure that shapes conclusions and reproduces existing power relations. This hampers the pluralism and critical evidence assessment that should characterise high-quality research.

### A Popper-Inspired Model for Reviews

We should rethink our approach to reviews by shifting focus from the accumulation of confirming evidence to the critical testing of hypotheses.

Why can Popper inspire new models?

Because current practice often:

- Accumulates confirming evidence without attempting to refute hypotheses.
- Overlooks negative results (publication bias).
- Reproduces dominant paradigms rather than testing them critically.

Popper's approach could lead to:

- Reviews that explicitly focus on testing theories through negative findings.
- Protocols that require active searching for disconfirming evidence.
- More pluralistic and open reviews where alternative hypotheses are included.

**Concrete elements in a new review structure:**

- **Inclusion criteria:** Must actively seek both positive, neutral, and negative results.

- **Analytical focus:** Where, when, and how does the hypothesis fail? Not just where it "works."

- **Discussion:** Focus on falsification potential rather than consensus.

### Revised Database Strategies

- **Multilingual and multinational searches:** Requirement to include non-English studies and databases from low- and middle-income countries.

- **Grey literature:** Mandatory search in grey literature to reduce publication bias.

- **Negative search strategy:** Requirement to use search terms aimed at negative and neutral findings.

- **Declaration of search choices:** Authors must justify their choice of databases and sources to ensure transparency.

### Strengthened COI Declaration Requirements

- **Full COI disclosure** for all authors (including consulting, ownership, payments within the last 5 years).

- **COI declaration** from peer reviewers and editors.

- **Weighting rule in analysis:** Explanation of how COIs in included studies influenced the synthesis.

- **Independence requirement:** Lead author must not have received industry funding related to the topic within the last 3 years.

Reviews are the link between research and existing knowledge and a foundation for all academic activity, regardless of discipline. It should therefore be a priority for all researchers to perform this task as precisely and critically as possible. However, this task has become increasingly complex — and in psychiatric research, almost impossible.

By rethinking our approach to reviews — inspired by Popper — we can restore a critical and pluralistic

synthesis of knowledge in psychiatry and other research areas where industry influence today distorts the evidence base.

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