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On ideals of objectivity, judgments, and bias in medical research – A comment on Stegenga

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ABSTRACT

By using Stegenga's article *Is meta-analysis the platinum standard of evidence* as a case study, this paper shows how different notions of objectivity can affect discussions concerning medical research. I argue that the ideal of objectivity that underlies Stegenga's article is both unattainable in practice and insufficient and unnecessary in principle to capture some of the ways in which biases may enter medical knowledge production.

1. Introduction

The focus of this paper is on how different notions of objectivity can affect philosophical and methodological discussions concerning medicine. I shall examine Jacob Stegenga's article *Is meta-analysis the platinum standard of evidence?* (2011). Stegenga studies meta-analysis as a method for amalgamating evidence and argues that meta-analysis is not an objective method and consequently falls short of being the platinum standard of evidence. As Stegenga himself states (2011, p. 499), "explication and assessment" of the concept of objectivity is beyond the scope of his paper. This is a task that I shall undertake in this article. I shall show that Stegenga's criticism of meta-analysis is based on an ideal of objectivity that is both unattainable in practice as well as insufficient and unnecessary in principle to perform the function of acquiring unbiased medical knowledge. The issues he discusses require a more substantive understanding of objectivity.

According to Stegenga, the lack of objectivity of meta-analyses is a consequence of the fact that despite the strict guidelines, researchers conducting meta-analyses have to make numerous judgments at different stages of the process, which allows for idiosyncrasies to impact the outcomes of the analyses. The ideal of objectivity that is entailed in Stegenga's argument requires excluding judgments and, following Douglas (2004), I shall call it *the procedural ideal of objectivity*. What this ideal requires is that there is a process or a method that makes judgments unnecessary and guarantees that the same outcome ensues regardless of who is performing the task. This can be done, for example, by invoking quantitative forms of processing information or establishing rules of how to perform the process. However, in practice, no set of rules can be specified to the necessary degree of exactitude, and even if a set of definite rules could be specified and followed, this would not guarantee the production of unbiased knowledge. My main claim is that striving for the procedural ideal alone is neither necessary nor sufficient for the trustworthiness of the produced knowledge.

The concept and history of objectivity have become salient topics in the philosophy and history of science. In addition to arguing for or against the objectivity of different fields of research, scholars have asked how the concept of objectivity has changed historically (Daston & Galison, 2007) and how it is used in current discussions (Douglas, 2004; Hacking, 2015), as well as developed accounts on what methods and practices best support this virtue (Kitcher, 1993; Longino, 1990). This paper takes part in these discussions by demonstrating how philosophical and methodological debates can be influenced by different understandings of what objectivity is and what methods guarantee achieving this virtue. Disagreements on what this concept denotes and what practices should be labelled as objective often underlie debates about which practices should be promoted in research. Stegenga's article serves as an example of this.

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A few caveats are in order: First of all, this is not a methodological paper on how to conduct meta-analyses. Instead, its focus is on "objectivity" and how this concept is used. Second, I do not disagree with Stegenga on his main claims: that conducting meta-analyses requires judgments and that there are reasons for questioning the epistemic status of meta-analysis. Neither do I deny that the problems identified by Stegenga, namely, publication bias and the lack of evidential diversity, are threats to the reliability of meta-analyses' results. Further, I do not claim that he takes achieving procedural objectivity to be the sufficient condition of producing knowledge we can trust in guiding our actions. Rather, by moving the discussion to the meta-level, I show that the notion of objectivity underlying his argumentation is both insufficient and unnecessary for assessing why the status of meta-analysis as the platinum standard of evidence is questionable. I recognize that Stegenga borrows this notion of objectivity from the advocates of meta-analyses and may not be committed to it himself (Stegenga, 2011, p. 499). However, as he does not question the value of this notion, I have the opportunity to do so. Lastly, I do not want to claim that the procedural ideal never has epistemic value. As humans are prone to reasoning fallacies and biases, establishing guidelines and rules for how to carry out a certain procedure can help to keep at bay some epistemically harmful factors operating on the individual level For instance, the preferences of individual persons grading a multiple choice test do not have an influence on the outcomes if the key has been premade (Douglas, 2004, pp. 461–462). Yet, for the reasons I shall articulate below, the procedural ideal should not be the ruling ideal when evaluating scientific practices.

The structure of the paper is as follows. In section 2, I begin with introducing Stegenga's argument against the status of meta-analysis as the platinum standard of evidence in medicine. "Objectivity" and its different meanings are the focus of section 3. In section 4, I argue that the so-called procedural ideal of objectivity does not succeed in weeding out detrimental biases. Section 5 deals with the problems the procedural ideal has in the context of medical research. Conclusions are drawn in section 6.

2. Summary of Stegenga's argument

In his article (2011), Stegenga sets out to critically evaluate meta-analysis, i.e., the use of statistical methods for amalgamating information from two or more independent primary studies to produce an overall measure of interest for the studies. The motivation for using meta-analyses and other systematic means for synthesizing evidence from numerous studies is that these methods are thought to produce more reliable information on the effect of interest than primary studies and qualitative reviews of previous literature. Primary studies can often be contradictory and too numerous for the users of evidence to go through, and qualitative reviews require analysts to employ their own expertise and judgment in deciding which studies should be included in analyses. Unlike in the case of unsystematic reviews, the use of a quantitative tool is thought to guarantee that individuals' preferences will not influence the outcome of evidence amalgamation. According to Stegenga (2011, pp. 497–498), the claimed methodological virtues of meta-analysis can be identified as follows: "Constraint – the use of meta-analysis should constrain intersubjective assessment of hypotheses – and Objectivity – meta-analysis should be performed in a way that limits the influence of subjective biases and idiosyncrasies of particular researchers." The pre-established rules for conducting analyses and the use of quantitative tools are thought to guarantee these virtues and make meta-analysis the platinum standard of evidence in medicine (Stegenga, 2011, pp. 497–498).

Stegenga's (2011, p. 499) argument against the high evidential status of meta-analysis boils down to that 1) because meta-analysis is not insensitive to idiosyncratic or personal biases, i.e., it is not objective, it 2) fails to constrain intersubjective assessment of hypotheses. Stegenga demonstrates how, despite the simplicity of the general principles of performing a meta-analysis, there are multiple stages of the process that force an analyst to make judgments. Most importantly, the choice of primary evidence, effect measure, quality assessment scale and averaging technique are steps that involve choices between different ways of proceeding and, thus, smuggle subjectivity into the process. Because these decisions require "[–] judgment and expertise [–]" (Stegenga, 2011, p. 505), meta-analysis fails to be an objective method. This lack of objectivity, according to Stegenga (2011, p. 499), is demonstrated by the meta-analyses that have reached contradictory conclusions on the same hypothesis. This, in turn, threatens the reliability of meta-analyses' results and their value in medical decision-making.

The sense in which Stegenga uses the concept of objectivity matches an ideal that Douglas (2004) has called *Procedural objectivity.* According to this understanding, a process is objective if "regardless of who engages in [it], they would do it in a same way, producing the same result" (Douglas, 2004, p. 462). This ideal of objectivity demands that the influence of subjective preferences and idiosyncrasies is blocked, for instance by rigid rules of how to carry out a certain procedure. According to this ideal, objectivity is lost if the rules allow individuals to apply them in different ways, making different conclusions on a same hypothesis possible. Central is that judgments, whether they are warranted or not, are taken to be detrimental to the trustworthiness of processes' results. The following quote shows how the ideal is used in Stegenga's article:

> "[–t]he plurality of the required decisions regarding which studies to include in a meta-analysis threatens Objectivity, and thereby Constraint. Regardless of how justified the decisions regarding choice of primary evidence are for any particular meta-analysis, they must be based on expertise and judgment, thereby inviting idiosyncrasy, and allowing a degree of latitude in the possible results of meta-analysis" (Stegenga, 2011, p. 502).

In order to make the argument at hand, I want to mention two additional issues that Stegenga sees as threatening the applicability of meta-analyses' results to practical decision-making: the use of a narrow range of evidence and publication bias, i.e., the nonappearance of papers showing null or negative results (Begg & Berlin, 1988).[1] What he means by the narrowness of evidence is that only evidence from randomized controlled trials (RCTs) is included in meta-analyses, while other types of evidence, for example, evidence from pathophysiological studies or animal studies, are ignored. In this way, meta-analysis violates the principle of total evidence. This, in turn, "risks making uninformed judgment [–] on a hypothesis" (Stegenga, 2011, p. 501) by limiting the external validity of results. Because of this shortcoming and because meta-analyses fail to constrain intersubjective assessment of hypotheses, Stegenga argues for the use of the so-called Hill strategy for assessing causal hypotheses in medicine. Publication bias and the limited availability of primary evidence, in turn, make performing meta-analyses more complicated. Studies with negative and inconclusive findings are often not easily available, and researchers need to decide how to unearth this evidence. In order to deal with publication bias, different analysts choose different ways of accessing the needed data, and "[h]ow intensely an analyst grapples with these practical problems of data access can influence the results of a meta-analysis" (Stegenga, 2011, p. 502). Here, Stegenga

[1] Stegenga discusses these and other problems of current medical research in more detail in his recent publications (2015; forthcoming).