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'Holding' and 'endorsing' claims in the course of scientific activities

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ABSTRACT

My principal aims are to show that holding, adopting and endorsing (definitions of which I provide) are distinct cognitive attitudes that may be taken towards claims at different moments of scientific activities, and that none of them are reducible to acceptance (as defined by Jonathan Cohen); to explore in detail the differences between holding and accepting, using the controversies about GMOs to provide illustrations; and to draw some implications pertinent to democratic decision-making concerning public policies about science and technology, and to the responsibilities that scientists thereby incur.

1. Introduction

Claims (hypotheses, theories, laws, models, explanations, predictions, results, reports, data sets, etc), entertained in the course of scientific activities, are often said to be *accepted* or *rejected*, and sometimes to be *believed*. According to Jonathan Cohen, belief is a subjective state: "belief that *p* is a disposition […] normally to feel it true that *p* and false that *not-p* […]". In this sense, established scientific claims need not be believed and often they are not. In contrast, Cohen maintains that to accept that *p* "[…] is to have or adopt a policy of deeming, positing, or postulating that *p*—i.e., of including that proposition … among one's premisses for deciding what to do or think in a particular context, whether or not one feels it to be true" (Cohen, 1992: 4). Accepting claims in this sense is integral to the activities of scientists. Consider, e.g., scientists recommending the agricultural use of a variety of GMOs on grounds that include the claims: (a) using these GMOs is efficacious, (b) using them properly according to mandated regulations does not occasion serious risks, and (c) there are no viable less risky alternatives with comparable benefits. They *accept* all of (a), (b) and (c); i.e., all are 'premises' in the schemata (practical syllogisms) that back their recommendation. Besides acceptance, however, other cognitive attitudes are also in play. One, which I will call *holding*, that may be taken towards (a), is different from another, *endorsing*, that often is taken towards (b), and possibly (c).

In this article, I will first distinguish three distinct cognitive attitudes that may be taken towards claims entertained in the course of scientific activities: *holding*, *adoption* and *endorsement*, and discuss their relationship with *acceptance*. (Throughout the article 'acceptance' will be used only in Cohen's sense.) Then I will explore the distinction between holding and endorsing in detail, and draw some implications that are pertinent to democratic decision-making concerning public policies about science and technology, and the responsibilities that scientists thereby incur.

2. Background

What is commonly called 'science' today is a multi-faceted socio-historical phenomenon, the current phase of a tradition, that incorporates (among other things): theoretical, experimental and observational research practices; bodies of theories, knowledge and understanding, and hypotheses that are being entertained; applications of scientific knowledge that open up new possibilities that can be utilized for various social ends (innovations, cures, technological objects, instruments); all linked with institutions that finance, support and administer research and applications, and that

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form new scientists, educate students to gain scientific knowledge, and otherwise disseminate the results and products of scientific research. Science, thus, incorporates a range of activities in the lifeworld that are engaged in by scientists, socially located human agents, whose actions cannot be explained without reference to claims that they accept, their beliefs, deliberations, goals, desires, motivations, values and other intentional states.

Values pervade all moments of scientific activities, just as they inform all human actions, but different kinds of values, associated with different cognitive attitudes, come to the fore at different moments. I find it convenient to distinguish five (logically distinct, but temporally and causally entangled) moments of scientific activities: M_1—making decisions about methodology; M_2—conducting research; M_3—appraising scientific theories as bearers of knowledge and understanding[1] and the cognitive credentials of particular hypotheses; M_4—disseminating scientific knowledge and the outcomes of research; and M_5—applying scientific knowledge. Social/ethical (non-cognitive) values have obvious legitimate roles at M_2, M_4 and M_5. The traditional view of *science as value free* maintains that cognitive values have indispensable roles at M_1 and M_3, but that ethical/social values have no proper logically relevant roles at them (Lacey, 1999; 2005a; 2005b).[2] I concur that, at M_3, cognitive values have indispensable roles and that ethical/social values have no proper roles alongside or overriding of them, but disagree that ethical/social values do not have admissible roles at M_1 (Lacey, 1999, 2005a).

Re M_1: any research project requires the adoption of a *methodological strategy* (Lacey, 1999, 2005a), which has two principal functions: to constrain the kinds of theories and hypotheses that are candidates for investigation and appraisal in a research project, thereby specifying the kinds of conceptual resources (and models, etc) available and the types of possibilities that can be encapsulated; and to select the kinds of empirical data to procure and report, of what phenomena and using what kinds of descriptive categories. The strategies that should be adopted may vary depending on the characteristics of the phenomena being investigated—e.g., one kind (those of molecular biology and biotechnology) for investigating the genomes of plants used in agriculture and how to engineer modifications of them, and other kinds for investigating the effects of using modified plants, *qua* biological and socioeconomic objects, on health and the environment in the agroecosystems in which they are actually grown and their products processed and consumed. Choice of object of investigation is likely to reflect particular ethical/social values, and this will have impact on what strategy is adopted. Indeed, I have argued that generally there are mutually reinforcing relations between adopting a strategy and adherence to an ethical/social value-outlook (Lacey, 1999, 2005a).

3. Three cognitive attitudes in play at different moments of scientific activities

In scientific activities, adopting a strategy logically, not necessarily temporally, precedes taking any cognitive attitude towards a claim (theory, etc). I will discuss three distinct cognitive attitudes—*holding*, *adopting*, and *endorsing*. None of them is reducible to *accepting* in Cohen's sense; and *accepting p* in a particular context does not provide a reason to take any one of them towards *p* in that context. Each one, however, when appropriately taken, provides a reason to *accept p* at one or other of the moments of scientific activities.

3.1. Holding a claim

Holding is a cognitive attitude taken towards claims following deliberation at M_3.

To hold p = to treat *p* as belonging to the stock of established scientific knowledge.

(*To discard p* = to hold *not-p*.) An item *p* belongs to the stock of established scientific knowledge if and only if it manifests the cognitive values highly, according to high standards for appraising the manifestation of these values, in the light of sufficient and relevant empirical data (Lacey, 2005a, ch. 1). Textbooks in well established areas of science (e.g., chemistry) provide exemplary items of the stock of established scientific knowledge, items that manifest the cognitive values highly according to most rigorous standards that have been developed as the scientific tradition has unfolded (Lacey, 1999, 62–66). Whether or not *p* is such an item is logically independent of its being believed or accepted and by whom it is held. Holding *p* provides a reason for accepting *p* in some contexts, e.g. in deliberations about the efficacy of proposed applications of relevant scientific knowledge.

A scientist (X) may incorrectly judge that *p* is an item of established scientific knowledge, and so incorrectly hold *p*. X may believe, accept or endorse *p* before it becomes correctly held. X may hold *p* and Y *not-p*, but *p* and *not-p* cannot both belong to the stock of established scientific knowledge. X does not correctly hold *p*, if, e.g., ethical/social values play non-eliminable roles (consciously or not), alongside or overriding of the cognitive values, in the deliberations that eventuate in him or her holding *p*. Moreover, *p* is correctly held only if it needs no further testing; i.e., only if (at M_2) the following conditions are satisfied: (i) All specifically-identified lines of research, which could produce outcomes that would lead to *discarding p*, have been pursued. (ii) All objections (including about the sufficiency of the available data)—which have actually been raised by people (credentialed scientists or not), who are committed to the general aims and norms of systematic empirical inquiry, regardless of the ethical/social values that they adhere to (Lacey, 1999: 62–66)—have been addressed. (iii) After repeated efforts and a reasonable lapse of time, no additional objections, accompanied by specific research proposals, are anticipated. In accordance with the general aims and norms of science (that I cannot elaborate in detail here), the mere logical possibility that subsequent research that might lead to *p* being discarded does not pose a barrier to correctly holding *p*; and certainly that it conflicts with (e.g.) religious beliefs or socioeconomic interests does not.[3] It is always *logically possible* that subsequent research will lead to *p* becoming discarded, and general inductive doubts can always be raised. That *p* is correctly held does not mean that it is certain or necessary, but that *in actual fact*, as when conditions (i)–(iii) are met, there is no good reason to think that more investigation might

[1] For the purposes of this article, 'theory' is used in a broad sense, to refer to organized bodies of knowledge, explanations and encapsulations of possibilities, so that it covers hypotheses, results and claims of greater or lesser generality—including profiles of the structures, dynamics and possibilities of local ecosystems, as well as (for certain well known theories) logico-mathematical structures that serve to represent knowledge and understanding.

[2] I consider the criteria for appraising the cognitive credentials of theories to be cognitive values (Lacey, 1999, ch. 3). What is essential to my argument, however, is that these criteria (however they might be analyzed) are not implicated in ethical/social value judgments (Lacey, 2004).

[3] Beliefs and interests can have legitimate roles at M_2, e.g., motivating persistence in efforts to establish a claim that is meeting strong opposition (e.g., the Copernican hypothesis in the early days of modern science), or motivating more rigorous scrutiny (based on specified research proposals) of claims before they can become correctly held. I imagine that X might correct hold *p*, and believe *not-p*—but this would not be based on reasoning following the general aims and norms of science.