What counts as a convincing scientific argument? Are the standards for such evaluation relative to particular disciplinary contexts? Or are there context-transcending standards of cogency? Answering these questions is important not only for establishing the rationality of science in cases of paradigm shifts and interdisciplinary disputes, but also for being able to critically assess issues at the boundary between science and society. Debates between evolutionary theorists and creationists raise questions about what counts as a scientific argument. And science poses challenges not only to religious beliefs, but also to personal and political interests. We are all constantly bombarded with new scientific findings regarding diet, health, and lifestyle and must decide which claims to take seriously. Policymakers and citizens have to decide whether scientific evidence is strong enough to warrant taking potentially costly measures, for example, in the debate over global warming. In *Cogent Science in Context*, William Rehg refers to such public controversies as the “new, public face of the academic science wars” (2) that have been brewing since the 1960s. A significant virtue of this book is that it combines attention to such public debate with rigorous philosophical and sociological analysis of science as an argumentative practice, deploying detailed case studies of actual scientific argumentation (for example, the discovery of the top quark at Fermilab) and science-based policy making (for example, expert panels convened by the National Academy of Sciences to study links between diet and health).
Before turning to the “critical contextualism” that Rehg ultimately defends, we need to identify the problem for which it is the solution. That problem is “Kuhn’s gap”: the gap between logical-rational and social-institutional perspectives on science that Thomas Kuhn opened with his critique of logical empiricists, who had largely relied on abstract rules of method and logical inference in analyzing the context of justification. Kuhn shifted attention toward the dynamics operative within the context of discovery and viewing scientific argumentation more as a social practice. The gap thereby opened up is both methodological and disciplinary (53-4). The methodological gap is that between two different perspectives on science: analyzing the cogency of the product of scientific argumentation versus analyzing the social-institutional processes of producing cogent arguments. This tends to support a disciplinary divide that pits philosophers on one side, relying on logical analysis of scientific argumentation, against sociologists on the other, focusing on rhetorical or social-institutional aspects of effective argumentation. Rehg aims to bridge both gaps and thereby foster interdisciplinary cooperation.

To do so, Rehg appeals to argumentation theory in viewing scientific inquiry “as a socially embodied constellation of argumentative practices” (269). Drawing on categories from the study of argumentation – product, process, and procedure as components of argumentation, and logic, dialectic, and rhetoric as three traditional modes of evaluation – he reconstruct a series of recent debates in science studies, broadly construed to include the history and philosophy of science along with the sociology of scientific knowledge. He identifies a series of failed attempts to bridge the gap between the rational and the social in the wake of Kuhn. Kuhn’s own solution was to stress the social-institutional dynamics of science as “collectively rational”: “collectively and in the long run, scientists respond to good reasons” (57). But this solution essentially absorbs the logical perspective into the social-historical perspective without looking
at the space in between, which includes rhetorical and dialectical perspectives. Rehg explores a range of such approaches (by Marcello Pera, Lawrence Prelli, and Bruno Latour), finds them wanting in various ways, and then turns to Jürgen Habermas’s discourse theory as one of the most promising approaches to bridging Kuhn’s gap.

It is worth considering in more detail what motivates the move toward Habermas. One key point is that Rehg wants to bridge the gap between descriptive and prescriptive approaches within science studies, giving each its proper due. Habermas’s combination of philosophical with sociological methodology makes it a good candidate for doing this. A related aim Rehg has is developing a form of critical science studies (CSS) that overcomes some of the relativistic implications of much of the sociology of scientific knowledge (SSK). Habermas’s account of the universal pragmatic presuppositions of argumentation – what Rehg calls “dialogical idealizations” – certainly provides such a non-relativistic approach. But perhaps the main reason for turning to Habermas is that focusing on the process and not just the products of scientific inquiry suggests that a conception of cogency should include an account of conditions for a sufficiently reasonable process of argumentation. Rehg rightly notes that Habermas has primarily applied such an approach to the domains of morality, law, and politics. So Rehg himself has to do the detailed work of developing a discourse theory of science, which he then critiques and to which he offers an alternative.

It is here, the point at which Rehg argues for moving beyond Habermas, that I want to make my first critical point. Rehg notes that the “negative status of compromise in Habermas’s model” (189) presents two problems. First, if SSK theorists are right that compromise and negotiation are common in scientific collaborations (Rehg uses the example of the Fermilab evidence paper on the discovery of the top quark to show how this works in practice), then
Habermas’s model is descriptively inaccurate. Second, if for a variety of reasons and under certain circumstances, compromise might be preferable to the kind of consensus based on the same reasons that Habermas privileges, then his model would be prescriptive in the wrong way. My first point is simply that if we take a cue from Habermas’s application of discourse theory to law and politics in *Between Facts and Norms* (1996), we see that compromise does not have such a negative status and that Habermas was in fact realistic about the significant role of compromise and negotiation in politics. But he maintained that the framework for making such compromises must be justifiable and so constrained by more idealized notions of, for example, fairness. The same point, with suitable modifications could presumably be made with regard to justifiable or reasonable compromise among scientific collaborators too. Rehg seems to acknowledge this (193), but seems to me also to over-stress the extent to which this aspect of Habermas’s theory represents an obstacle.

Before turning to my second critical point, I should explain the basic idea of Rehg’s own position, “critical contextualism.” The key move is a shift away from Habermas’s general philosophical theory of cogency to a more context-sensitive approach that relies on “participants’ judgments – what scientists perceive as cogent in the specific context at issue” (209). To do this, Rehg introduces a three-dimensional framework for assessing the cogency of scientific arguments according to their “content merits” (evaluating the argument’s content), “transactional merits” (evaluating the quality of the locally situated transactions among scientists that produced the argument), and “public merits” (evaluating the ability of the argument to appeal beyond particular transactional domains within a broader public sphere that is itself well-structured to sustain collective reasonableness). This puts the stress less on a set of independent logical, dialectical, or rhetorical standards and more on the different levels of context in which the
meaning and relevance of such standards are concretely realized (271). The critical side of
critical contextualism draws on the critical perspective of participants themselves, from scientists
to a lay public who – as Rehg shows with his analysis of the scientific and public reception of
reports by NAS advisory committees – already critically engage scientific arguments in terms of
these three types of merits. Thus, the critical contextualist framework is not externally imposed,
but is more of a heuristic for argumentation theorists to enter the discussion as one critical
participant among others. In this way, it also aims to bridge the disciplinary divide between
“critical” anti-relativistic approaches and more relativistic “contextualist” approaches.

My second point is about the weight that Rehg places on interdisciplinary cooperation:
fostering it is one of his primary aims in overcoming Kuhn’s gap, and the extent to which
Habermas’s model would hinder it is one of his main criticisms of Habermas. But I am not sure
I see how important it is. If the aim of SSK theorists is primarily descriptive, I can see why a
CSS theorist might want to draw on some of their work to inform his or her analysis. But why
would a deeply relativistic SSK theorist want to draw on CSS work at all? Moreover, how much
of an obstacle would Habermas’s approach actually pose to such cooperation? Rehg makes an
excellent point about how Habermasians should not view pragmatic presuppositions like “laws
that automatically have jurisdiction over any and all arguments,” but that “their relevance must
be demonstrated for the locale and context in question” (241). In this way, process idealizations
central to discourse theory can be made more context-sensitive by viewing them as “enduring
sites of contest and reflection in social life” (229). But if such dialogical idealizations can indeed
be contextualized in a variety of ways, then the extent to which a theory that posits them is an
obstacle to interdisciplinary cooperation seems to decrease.
It also seems to me that Rehg is ultimately pulled in two different directions. The goal of interdisciplinary cooperation with SSK theorists, including those committed to some version of relativism, pulls in one direction (toward a more thorough-going contextualism), while the goal of having a theory that bridges the science-society interface pulls in another (toward the need for a more context-transcending theory of argumentation that can be applied within and across scientific and deliberative democratic contexts). Something has to give here. Since Rehg does not want to be pulled too far in the direction of relativism, I would argue that the Habermasian approach has more to offer, in particular once we get to really addressing the thorny questions raised at the end of the book about competing visions of the relation between science and society.

I certainly have not done justice to all of the arguments in Rehg’s comprehensive and meticulously well-argued book. Although I have focused my critical remarks primarily on Rehg’s engagement with Habermas, that has more to do with my own interests than with the overall focus of the book. Rehg’s book is no mere application of Habermas’s discourse theory to science. It does provide a detailed account of what a Habermasian discourse theory of science would look like, and does so quite well. This is not surprising since Rehg had already written one of the best books on Habermas’s theory of practical discourse (Insight and Solidarity: The Discourse Ethics of Jürgen Habermas [University of California, 1994]). But the book also provides a lucid and compelling reconstruction of debates within science studies over the last century using the resources of argumentation theory, and a bold defense of “critical contextualism” as an interdisciplinary framework for addressing significant tensions within science studies and a critical framework for assessing the cogency of scientific arguments.