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‘Scientifically-based research’: the art of politics and the distortion of science

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The US Federal Government is forcefully prescribing a narrow definition of ‘scientifically-based’ educational research. US policy, emerging from contemporary neoliberal and technocratic viewpoints and funded and propagated on a large scale, has the potential to influence international thinking on educational research. In this article we continue a policy critique that has emerged and address three problems associated with the US Government’s narrow definition of research: (1) the Government’s claims about ‘scientifically-based research’ are, in themselves, philosophically problematic; (2) the emphasis on quantitative, experimental research is modeled in a questionable manner on techniques from the natural (and especially medical) sciences, and the emphasis on applicability and transferability of findings can be directly related to a predominance of economic principles and discourse; (3) the research commissioned and used by the US Federal Government itself is inconsistent with the rhetoric of scientific criteria. We call for educational leaders and researchers to challenge the Governmental manipulation of science and the marginalization of the education profession from policy-making in its own field.

Introduction

But let us remember that although there may be many sciences, there is not yet science, because the scientificity of science always remains dependent on ideology, an ideology that no particular science, be it human science, is able to reduce today ... (Maurice Blanchot, as cited in Derrida, 1994, p. 35)

In 1997 the National Institute of Child Health and Human Development, one of the US National Institutes of Health (NIH), convened a National Reading Panel (NRP). The purpose of the panel was to conduct a meta-analysis of existing research on reading instruction, in order that methods of teaching reading might be improved to reflect ‘research-based’ findings on the effectiveness of various forms of reading instruction. The majority of the 14 members of the panel were cognitive scientists with NIH credentials and, in the spirit of NIH’s mission, they adopted a medical research model

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(Garan, 2001). In the widely distributed *Summary*, the NRP claimed that its report *Teaching children to read* represented 'comprehensive, formal, evidence-based analyses of the experimental and quasi-experimental research literature relevant ... in teaching children to read' (1999, p. i). One of the two panel members with extensive classroom background in the teaching of reading, Joanne Yatvin, eventually dissented strongly from the NRP report *Teaching children to read* and wrote a minority report. Yatvin (2002) was disturbed by the scientists' 'quick and unequivocal' selection of one reading model as the basis for the panel's investigation (p. 366). 'In the end,' she observes, 'only 428 studies were included in the NRP subcommittee reports. Thousands of studies were rejected without analysis because their titles, publishing circumstances, or abstracts revealed that they did not meet the panel's criteria' (p. 368).

While scholars in education continue to debate the NRP's methods and motives, the Federal Government has moved quickly to institutionalize its approach in other fields in education, with little concern for substantive consultation. The elementary and secondary Education Act *No Child Left Behind* (ESEA/NCLB), signed by President George W. Bush on 8 January 2002, adopted this theme and introduced across the US the notion that education policy should be driven only by 'scientifically-based research'. The Federal Department of Education's *Strategic Plan 2002–2007* likewise aims to transform education 'into an evidence-based field'.

In the *Journal of Curriculum and Supervision*, O. L. Davis Jr. (2002) invited 'researchers and other educators to voice their reasoned ideas about the changing future of educational research' (p. 282), and Flinders (2003) responded to that call with 'Qualitative research in the foreseeable future: no study left behind?' In the volume *Evidence-based practice in education* (Thomas & Pring, 2004) several articles raise questions about the legitimacy of the demand in educational research for methods modeled on the medical sciences. And in the journal *Qualitative Inquiry*, Staller (2006) argues that the notion of 'evidence-based practice' remains empty in qualitative research if the 'evidence' on which practice is supposed to be based is not, itself, 'practice-based' (p. 513). With this article we hope to continue and add to this conversation.

During the post-NCLB period educational researchers have repeatedly spoken out to assert that the US Federal Government's definition of 'science' and 'research' in the field of education wrongly limits the contributions research can make to education in general and schools in particular. As Purcell-Gates (2000) has argued, 'we do not stand a chance of solving problems of learning and teaching if we confine ourselves solely to [experimental and quasiexperimental] methodologies'. And Flinders (2003) remarks, 'when viewed within the contexts of both recent history and contemporary work, a significant portion of our most valued research conducted by leaders in the field would not measure up to the *Strategic Plan's* standards' (p. 385).

For decades the Federal Government has managed to express its influence and foster programs in public education without entering the epistemological battlefield of educational research methodology, a subfield of philosophy of science. This position has now been reversed in a manner that reflects little or no consideration for the proper role of a democratic Government in such a debate. Davis Jr. (2002) observes,

'educational research ... has joined other aspects of public education in the United States as the object of Government oversight, "transformation", and influence, if not outright control' (p. 282). He further notes, with some surprise, that 'these impressive developments have not been challenged as violations of constitutional authority' (p. 282). The sciences form a field that, in democratic societies, typically sets its standards internally and is shielded from Government intervention in those standards. The US has advanced in science and technology by avoiding arbitrary or ideological interference by Government. The current prescription by the US Federal Government of one educational research paradigm reflects a lack of trust in the academy not commonly seen in democratic societies.

In the sections that follow we will focus our efforts on three problems associated with the US Federal Government's narrow definition of scientific educational research:

- The Government's claims about 'scientifically-based research' are, in themselves, philosophically problematic.
- The emphasis on quantitative, experimental research is modeled on techniques from some of the natural sciences (e.g., medicine), and the emphasis on applicability and transferability of findings can be directly related to a predominance of economic principles and discourse.
- The research commissioned and used by the US Federal Government is inconsistent with the rhetoric of scientific criteria.

Déjà vu?

Section 9101 of the *No Child Left Behind Act* of 2001 provides definitions of the central terms used in the Act. In definition no. 37, 'scientifically-based research', the US Federal Government specifies that:

The term scientifically-based research:

- (a) Means research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs; and
- (b) Includes research that —
 - (i) Employs systematic, empirical methods that draw on observation or experiment;
 - (ii) Involves rigorous data analyses that are adequate to test the stated hypotheses and justify the general conclusions drawn;
 - (iii) Relies on measurements or observational methods that provide reliable and valid data across evaluators and observers, across multiple measurements and observations, and across studies by the same or different investigators;
 - (iv) Is evaluated using experimental or quasi-experimental designs in which individuals, entities, programs, or activities are assigned to different conditions and with appropriate controls to evaluate the effects of the condition of interest,

with a preference for random-assignment experiments, or other designs to the extent that those designs contain within-condition or across-condition controls;

- (v) Ensures that experimental studies are presented in sufficient detail and clarity to allow for replication or, at a minimum, offer the opportunity to build systematically on their findings; and
- (vi) Has been accepted by a peer-reviewed journal or approved by a panel of independent experts through a comparably rigorous, objective, and scientific review.

From this definition it is clear that for educational research to be deemed ‘scientifically-based’, it needs to be modeled after forms of research developed and used in natural sciences such as medicine. The emphasis on experimental or quasi-experimental research designs, and the reliance on measurement and replicability, exclude ethnographic and other qualitative research methods that have become widely valued by teachers and administrators.

In its *Strategic Plan 2002–2007*, The US Department of Education outlines its six ‘strategic goals’ for the period 2002–2007. As its fourth goal, it lists the transformation of education ‘into an evidence-based field’, within which two objectives are identified: ‘raise the quality of research funded or conducted by the Department’ (4.1) and ‘increase the relevance of our research in order to meet the needs of our customers’ (4.2). Two criteria are listed for the assessment of the ‘quality of research’: the extent to which the research is ‘deemed to be of high quality by an independent review panel of qualified scientists,’ and the extent to which ‘new research and evaluation publications funded by the Department that address causal questions’ employ ‘randomized experimental designs.’ Regarding the ‘panel of qualified scientists’ the Department further remarks that it will enlist ‘only those qualified scientists who have high levels of methodological and substantive expertise pertinent to the projects being reviewed’. Regarding the specification that the use of randomized experimental designs applies to research and evaluation publications that address causal questions, the Department explains that ‘these would include all research and evaluation studies initiated by any office within the Department, but would exclude collections of statistics’.

This perspective on ‘scientifically-based research’ takes us back to a reductive positivism and glosses over the analyses and arguments put forward by philosophers of science for decades. Educational researchers inherited from nineteenth century thought the idea that social science could follow in the positivist path of natural science and free itself from subjectivity, imprecision, and weak predictive validity. The message of the twentieth century may be, however, that this is for at least two reasons a vain pursuit. First, the dominant view of philosophy of science has during the past three decades become that social science will not closely replicate the methods of natural science and is not likely to achieve the apparent exactitude of those fields. Charles Taylor (1985) formulated his critique of the quest for close measurement and causality by calling on scholars ‘to go beyond the bounds of a science based on verificationism

to one which would study the inter-subjective and common meanings embedded in social reality' (p. 52). In education even leaders of positivist research recognized this type of analysis as an advance of theory and accounted for it in the literature (Cronbach, 1975; Guba & Clark, 1975). In the years that followed there has been a dramatic reconfiguration of educational research, which is reflected in journal publications, dissertation methodologies, and the composition of research faculties.

Secondly, there is a larger question about whether natural science itself can be accurately described in this positivist manner. The Hungarian–British chemical scientist and philosopher Michael Polanyi, for example, demonstrates over and over again that much as positivists wanted to see scientific discovery as wholly detached and free from human belief, science is, in fact, very much a human enterprise. In his essay 'The nature of scientific convictions', originally published in 1949, he cites numerous examples from the history of the natural sciences as evidence for his claim that 'whether any particular [scientific] discovery is recognized and developed further, or is discouraged and perhaps even smothered at birth, will depend on the kind of belief or disbelief which it evokes among scientific opinion' (Polanyi, 1974, p. 52). The progress of science, whether in education or other fields, *necessarily* depends on beliefs in and commitments to the pursuit of particular research trajectories at the expense of others. Such beliefs and commitments are collective and contingent, not individual and arbitrary, but beliefs and commitments they are: 'any account of science which does not explicitly describe it as something we believe in is essentially incomplete and a false pretense' (p. 51). This is also the point made by Maurice Blanchot in the opening quotation: in order to assert 'scientificity' or 'scientific' quality, all research relies on ideological commitments that cannot be derived from the research itself.

Moreover, just because a truth-claim is empirically and objectively verifiable, this does not mean that that truth-claim is of value for educational practice. Adhering to the natural science paradigm 'has often driven investigators away from a serious concern with the human world into the sterility of purely formal argument and debate' (Rabinow & Sullivan, 1979, p. 4). Richard Smith (2003) gives the following example to show that what 'works' according to 'scientifically-based' research, is not always workable:

If it could be [scientifically] shown that administering severe electric shocks improved children's reading scores, there would be no bland proclaiming that electric shocks work. If monotonous, repetitive drilling, 'teaching to the test,' improves pupils' test scores then clearly such teaching works—but only if the point of the teaching is simply and only to increase the test scores. (Smith, 2003, p. 135)

Likewise, it is quite possible to design random experiments that are replicable and that focus on causal relationships in the field of education—but nothing in that test design itself guarantees the desirability or relevance of the research questions or outcomes.

Laitsch (2003) points out that both the National Research Council (part of the National Academy of Sciences) and the American Educational Research Association use definitions of 'scientifically-based research' that include qualitative methodologies.

According to Laitsch, the NCLB definition, which considers only quantitative research—preferably in the form of randomized trials—scientifically-based, ‘creates a false dichotomy, implying that all other research is not based in science’ (p. 2).

Another way of characterizing the problem is by reference to the way in which the policy discourse on educational research is being *framed*. For example, the policy issue of reading instruction was framed in a particular way by selecting only one research paradigm as worthy of the name ‘research’. As Schön and Rein (1994) point out, policy issues rest on ‘frames’, the ‘underlying structures of belief, perception, and appreciation’ that set and define the problem in a particular way (p. 23). One can think of frames as narratives, ‘in which the author describes what is wrong and what needs fixing’ (p. 24). Frames often rely on ‘generative metaphors’ (p. 26), central images that capture the essence of the frame, and whose appeal derives from metaphors firmly established in the culture in which the policy issue has arisen. The NRP argues that the effectiveness of reading instruction can and should be assessed according to ‘methodological standards normally used in research studies of the efficacy of interventions in psychological and medical research’ (NICHD, 1999, p. 1). Cunningham (2001) points out that ‘this argument is based on a *metaphor* of reading instruction being like the curing of psychological and physical diseases’, and asks, ‘What if healthy human development is a better *metaphor* for schooling and the teaching of reading ... than is the metaphor of treatments for specific mental or medical ailments?’ (p. 330, emphasis added).

This analysis of contrasting metaphors is worthy of particular consideration since it summarizes one defining element of the debate between the ascendant NCLB policymakers and the education establishment, humanist elements of which they oppose. The implicit disagreement is, on the one hand, that the learner is largely an ‘empty’ and passive vessel, possibly flawed in nature and in need of training and discipline. Or, on the other hand, that the learner is disposed toward learning and reading and can be ‘drawn forth’ through invitation, interest, and an environment rife with human meaning and affect. There is also the consideration that neither metaphor is ‘true’ a priori, but that our practice of one or the other shapes the character of learners and thereby creates our incipient social reality.

A generative metaphor is a metaphor that selects certain features of the issue at hand, and suggests what direction to take.

Indeed, the diagnosis and the prescription will seem obvious. This sense of obviousness of what is wrong and what needs fixing is the hallmark of policy frames and of the generative metaphors that underlie them ‘ (Schön & Rein, 1994, p. 28)

When reading instruction is viewed through the metaphoric lens of distinct medical interventions to remove or cure distinct medical problems, reading and reading instruction are seen as series of distinct activities and interventions that hardly interact and that can be studied and remedied separately. When reading instruction is viewed through the metaphoric lens of holistic human health and development, however, reading and reading instruction are seen as complex processes in which all activity components interact with one another.

In the working group conference 'The use of scientifically-based research in education' (2002), Valerie Reyna, Deputy of the US Federal Office of Educational Research and Improvement, claimed that the rules:

... about what works and how to make inferences about what works ... are exactly the same for educational practice as they would be for medical practice. Same rules, exactly the same logic, whether you are talking about a treatment for cancer or whether you're talking about an intervention to help children learn.

The direct parallel drawn here between medical interventions and education is shockingly simplistic, but unfortunately not unique to the US. In the UK, Malcolm Wicks, Parliamentary Under Secretary for Lifelong Learning, made a similar comparison in 2001 between education and medicine, with the same purpose of arguing for educational research that leads to 'valid and reliable evidence about effective teaching' (as cited in Smith, 2003, p. 129). Reyna and Wicks illustrate Polanyi's point that scientific research presupposes certain beliefs and commitments that drive the research in a particular direction. Evidently, both Reyna and Wicks believe that medical science in its more positivist manifestations is an appropriate and productive generative metaphor for policy discourse in education. This is a belief we do not share.

Much like Polanyi, American philosopher Hilary Putnam (1981) has argued against dichotomies such as fact/value and objective/subjective. There is another aspect of Putnam's critique of narrow, positivist conceptions of science, however, that merits our attention here, and that speaks directly to Richard Smith's (2003) previously mentioned concern over educational methods that may 'work' but should be rejected. In section 9101 of the *No Child Left Behind Act*, cited earlier in this article, the definition of 'scientifically-based research' is entirely methodological. The *Act* specifies in considerable detail the kinds of research designs and the methods of observation, analysis, and presentation that will meet the Governmental standard of 'scientificity'. It is hard not to read in this definition precisely the kind of 'methodological fundamentalism' Staller (2006) makes note of (pp. 508–509), but let us focus on Putnam's arguments here. If we accept that the purpose of science is to produce facts, and that facts are statements 'that it is rational to believe' (Putnam, 1981, p. 201), then we must develop criteria of rationality. These criteria cannot only consist of methodological criteria, however—criteria about *how* the scientists arrived at the fact—but must also include criteria of relevance. Criteria of relevance are criteria of value, but they are indispensable for the rational judgment of scientific facts (p. 201). By leaving out criteria of relevance from their definition of 'scientifically-based research' and focusing solely on methodology, the US Government has not increased but rather compromised the rationality of the standards by which educational research is to be judged.

Science and the postmodern condition

Rather than buy into the understanding of science as objectively, disinterestedly and a-contextually true, Putnam (1981) observes that 'what we are trying to do in science

is to construct a representation of the world which has the characteristics of being instrumentally efficacious, coherent, comprehensive, and functionally simple', and he explains that:

... the reason we want this sort of representation ... is that having this sort of representation system is *part of our idea of human cognitive flourishing*, and hence part of our idea of total human flourishing, of Eudaemonia. (Putman, 1981, p. 134)

The criterion of instrumental efficacy, in particular where economic growth and competitiveness are concerned, has become a particularly strong criterion for what qualifies as 'scientific knowledge'.

The emphasis on quantitative research modeled on techniques from the natural sciences, and the emphasis on applicability and transferability of findings can be directly related to the predominance of technological and economic principles and discourse. Jean-François Lyotard's (1984) analysis of the changed status of knowledge and the dominance of the 'performativity principle' in 'the postmodern condition' offers a solid and relevant philosophical basis for this point. In *The postmodern condition: a report on knowledge*, Lyotard examines the discourse that science uses to legitimize its own status (p. xxiii). (Interestingly, Lyotard wrote this 'report on knowledge' at the request of the president of the Council of Universities of the Government of Quebec.) Some 25 years ago, Lyotard observed:

... the decision-makers ... allocate our lives for the growth of power. In matters of social justice and of scientific truth alike, the legitimation of power is based on its optimizing the system's performance-efficiency. The application of this criterion to all of our games necessarily entails a certain level of terror, whether soft or hard: be operational (that is, commensurable) or disappear. (Lyotard, 1984, p. xxiv)

Lyotard's use of the term 'games' refers to 'language games', a term first introduced by Wittgenstein. The idea is that various types of discourse are not unlike various kinds of games. If one tries to understand or intervene in the game of basketball by applying the rules of, say, chess, confusion will ensue. And if one imposes the rules of chess on the game of basketball, the latter will be not just altered, but so severely restricted in its functioning, that it will be hardly worth the name basketball. In a similar vein, Lyotard observes that the various discourses (games) used in the academy are increasingly subject to the rules of one among them: economics. With the US Federal Government controlling important grant money, the message to educational researchers is: be commensurable with our definition of research and our interest in optimizing education's contribution to the economy—or disappear.

The corollary of this policy direction, and possibly one of its motives, is that large public education budgets are opened up to the private sector. Stephen Metcalf (2002) has examined the close ties between the Bush and McGraw families. He notes that both as Governor of Texas and as President of the United States, George W. Bush's 'education policies have been a considerable boon to the textbook publishing conglomerate' (p. 20), and that McGraw-Hill is one of the 'Big Three' in the oligopoly of standardized testing and textbook publishers (p. 19). In this context it is worth mentioning that the *Summary* of the NRP report, as well as a video and the press

releases, was neither prepared nor vetted by the members of the Panel, but by Widmeyer Communications. Cunningham (2001) observed that one must read the full NRP report, *Reports of the subgroups*, rather than the *Summary* 'to fully understand the findings and recommendations for classroom practice and future research' (p. 326). And Garan (2001) has pointed out significant discrepancies between the *Summary* and the *Reports of the subgroups*. For instance:

... neither the *Summary* nor the video makes reference to any of the limitations of the study. Indeed, in some instances, the conclusions in these short versions directly contradict the data and the NRP's own statements in the *Reports of the subgroups*. (Garan, 2001, p. 505)

Widmeyer Communications is a public relations firm that features McGraw-Hill among its clients (Metcalf, 2002, p. 21). There is in such endeavors the appearance of conflicts of interest among politicians, their donors, corporations, and Government officials. Educational researchers are well advised to exercise appropriate skepticism about the objectivity of processes that arise in such contexts.

Of course there are lenses other than that of economics through which to view the motivations of those in the realm of education policy who are co-opting the language of science. Michael Apple (2001) focuses on their appetite for 'identities' such as neoliberal, neoconservative, authoritarian populist, and managerialist. These identities also have much in common with, respectively, categories such as economic fundamentalist, libertarian, religious fundamentalist, technicist. NCLB's program can be seen as an amalgam of these interests. Policy such as NCLB represents compromise among such parties in an effort to build a majority coalition. 'Out of all these multiple spaces and identities, and the conflicts, tensions and compromises that their interactions generate, policies evolve' (Apple, 2001, p. 196). Unfortunately some groups are left out of this congress of interests. These include marginalized economic and racial populations and those with so-called 'secular humanist' values, as reflected in the progressive tradition in education and politics. Those identified with the fine and performing arts are also given short shrift and their share of the 'scientifically-based' curriculum has suffered commensurately. Those Native- and African-Americans, Latino- and Chicano-Americans, and South East Asian-Americans who are economically marginal are more than left out: they are pushed out of education by the policies of NCLB. The premier tool of NCLB is the standardized test which, when used in high stakes ways, such as exit examinations for high school, provides an unyielding face and effective barrier to those who begin with serious deficits of what has come to be known as 'educational readiness'. Some will argue that this is a fair and appropriate judgment of merit while others question whether a science that is imprecise should be mechanistically applied when it has such grave consequences to individuals.

Walking the talk?

One of the questions raised by the US Federal Government's imposition of strict standards on 'scientifically-based educational research', is whether the Government,

in the research it commissions and uses for its policy decisions, lives up to its own standards. James Cunningham (2001) argues that the NRP did not meet its own criteria in the *Report*, by, for example, citing no evidence to support its approach to determining which studies it selected as meaningful, i.e., ‘scientific’ (p. 328). Garan (2001) provides evidence especially from the ‘Alphabetics’ subgroup (which had the task of examining research on phonemic awareness and phonics instruction) to argue that the NRP violated its own standards. She writes that:

... the NRP report fails to meet the criteria for a sound meta-analysis for two reasons: 1) the small number of studies seriously compromises the reliability of the results, and 2) the dependent variables of the meta-analysis are conceptually inconsistent. (Garan, 2001, p. 503)

Gerald Coles’ (2003) detailed analysis of the *Report* and its appendices also shows that the NRP falls short of its own scientific standards in a variety of ways. Coles echoes Cunningham’s criticism about the criteria used to exclude many studies from the review, noting that ‘the Panel’s arbitrary and a priori conclusions [about what mattered in reading instruction] provided the overarching pruning device for removing the scientific knowledge that should have informed the Panel’s inquiry’ (p. 41). At the same time, several of the studies that were selected and that supported the NRP’s conclusions about the superiority of skills- and phonics-based reading instruction, violated even the most basic scientific principles. One such principle is that in quantitative experimental studies of the kind that the Panel chose to focus on, the experimental and control group have to be truly comparable. Coles notes, however, that in many of the studies used in the *Report* the comparisons were ‘incongruous’ because the studies used ‘control groups that provide[d] no proper contrast for judging the value of the instruction used by the experimental group’ (p. 45).

A second important scientific principle violated by the *Report* is a clear understanding of the difference between correlation and causation. Based on his own careful review of the studies used to support the NRP’s conclusions, Coles observes that ‘a confusion between correlation and causation runs through the entire “Phonemic Awareness” and “Phonics” sections of the Report’ (p. 56). In the section ‘Encouraging students to read more’, however, in which approaches other than skills- and phonics-based instruction are considered, the *Report* does emphasize the distinction between correlation and causation, and uses this distinction to cast doubt on the merit of studies supporting approaches that encourage students’ reading, such as sustained silent reading (p. 100). Such unequal methodological scrutiny can hardly be considered a scientific principle.

Despite the flaws in the research methodology of the panel itself, adherence to strict scientific criteria was cited as the reason for excluding research on reading instruction methods not exclusively based on phonics. One example of a reading instruction method that was excluded from the purview of the panel was Reading Recovery®. Although there is an abundance of research that supports it, and sound reasons to accept that research as scientific, Reading Recovery was not considered at all. It is important to recognize that the case for Reading Recovery can be well made through

'evidence-based assessment of the scientific research literature'. An experiment employing a randomly assigned design and published in *Elementary education* demonstrated extremely strong effects for Reading Recovery (Pinnell, 1989). This research, funded by the MacArthur Foundation and evaluated by external analysts from the University of Chicago, won the Albert Harris Award of the International Reading Association. Supporting research was published by *Reading Research Quarterly* (Pinnell *et al.*, 1994). The NRP consciously declined to look at Reading Recovery research, regardless of its 'scientific' credentials, because the panel focused on isolated skills, such as letter-sound instruction, rather than integrated approaches. As we discussed in the section on frames and generative metaphors, the NRP framed reading and reading instruction as an assemblage of discrete skills and activities, rather than as a complex, strategic process. Thus framed, improvements to reading instruction would 'naturally' avoid practices such as Reading Recovery.

The Government's apparent mistrust of the academy's ability to monitor its own quality is a symptom of a wider gap between academicians and policymakers. As Shaker and Heilman (2004) point out, since educators are typically excluded, the officials making decisions about public education are often non-specialists who are vulnerable to, if not welcoming of, advocacy in the guise of science. This has led to the growth of a parallel educational infrastructure of think tanks, websites, organizations and journals. Apparent to professional researchers but not to media and political figures, the 'advocacy research' propagated thereby often violates important research standards such as peer review. The Education Policy Research Unit (2006) of Arizona State University has established a 'Think Tank Review Project' that documents this type of erosion of research standards.

Conclusion

In this article we have set out to demonstrate that the US Federal Government's assertions and policies regarding scientifically-based research in education are problematic, as are shifts towards narrow conceptions of 'evidence-based' educational research and practice elsewhere. As a source of over one billion dollars in educational research funding each year, US agencies have influence beyond their national borders. Our analysis claims that these problems are rooted not only in philosophical shortcomings, but also in the notion of a Government bureaucracy assigning to itself extensive authority in defining a professional field of study and practice. These aggrandizements emerge from various points of view, including neoliberal economic thought and, in separate but compatible fashion, a technocratic viewpoint. Along with these issues come political and economic conflicts of interest, as partisan politicians seem drawn to 'scientifically-based judgments' that favor corporations and individuals with whom they have ties. All this has led to erosion in the confidence the public and educators have had in Washington's protection of the public good as manifested in US public schools. Educational leaders should challenge the Governmental manipulation of science, the marginalization of the education profession from policy-making in its own field, the dubious quality of the NRP's *Report* and *Summary* as well as other manipulations of

research, and the departures of the Department of Education from cooperation and collegiality with the educational research community. As has frequently occurred in recent history, the debate around this educational issue is forfeit if the larger context is left unquestioned.

Patti Lather (2003) offers three suggestions for responses by educational practitioners and researchers; we believe these are relevant to policy contexts not only within the US but also in the UK and elsewhere. First, we need to offer 'a sustained critique of the nakedly self-aggrandizing aspects' of definitions of 'scientifically-based' research. Second, we need to engage in 'rhetorical intervention' based on critical analyses of policy discourse from, for instance, feminist and postcolonial perspectives. Third, we need to create 'a very strategic infusion of the ranks of program evaluation and policy analysis'. Rather than remaining on the outside of policy research and development and despairing over policy decisions affecting educational practice and research, we ought to work from the inside to redirect policy development. Lather poignantly observes, 'If we don't want these folks running the show, we need to be sure we are producing alternative practitioners of program evaluation and policy analysis'.

As articulate, informed citizens in a democratic society, educators also have a range of means to assert influence available to them in media, organizations, institutions, and directly through political activism. We cannot expect others to care more for the integrity of our profession than we ourselves do. The debate has been clearly drawn and the question remains of whether educators and educational researchers care to effectively present their point of view. In this sense our profession is being tested as to the passion it holds for its espoused ethics and traditions.

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