

## Forbidden Knowledge

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There is growing concern about the politicization and social control of science, constraining the conduct, funding, publication, and public use of scientific research (1). For example, human cloning and embryonic stem cell creation have been regulated or banned (2), activists have been lobbying Congress to remove funding from certain government-sponsored research (3–5), and science journal editors have been compelled to develop policies for publication of sensitive manuscripts (6, 7).

Forbidden knowledge embodies the idea that there are things that we should not know (8–15). Knowledge may be forbidden because it can only be obtained through unacceptable means, such as human experiments conducted by the Nazis (9, 11); knowledge may be considered too dangerous, as with weapons of mass destruction or research on sexual practices that undermine social norms (8, 9, 12); and knowledge may be prohibited by religious, moral, or secular authority, exemplified by human cloning (10, 12).

Beyond anecdotal cases, little is known about what, and in what ways, science is constrained. To begin to fill this gap, we performed an interview study to examine how constraints affect what scientists do. In 2002–03, we conducted 10 pilot and 41 in-depth semistructured interviews with a sample of researchers drawn from prestigious U.S. academic departments of neuroscience, sociology, molecular and cellular biology, genetics, industrial psychology, drug and alcohol abuse, and computer science. We chose diverse disciplines to gauge the range, rather than prevalence, of experiences.

We asked subjects to consider their practices and rationales for limiting scientific inquiry or dissemination and to tell us about cases in which research in their own discipline had been constrained. Respondents reported a wide range of sensitive topics, including studies relating to human cloning, embryonic stem cells, weapons, race, intelligence, sexual

behaviors, and addiction, as well as concerns about using humans and animals in research.

Nearly half the researchers felt constrained by explicit, formal controls, such as governmental regulations and guidelines codified by universities, professional societies, or journals. Respondents generally agreed that formal controls offered important protections. Less consensus surrounded the necessity, efficiency, or good sense of specific policies. Stem cell research was repeatedly identified as an example of an overly restricted area. Many respondents expressed a preference that scientists—not policy-makers—determine which research is too dangerous.

We were surprised, however, that respondents felt most affected by what we characterize as “informal constraints.” Researchers sometimes only know that they have encountered forbidden knowledge when their research breaches an unspoken rule and is identified as problematic by legislators, news agencies, activists, editors, or peers. Studies by Kinsey *et al.* (16, 17), Milgram (18), Humphreys (19), Herrnstein and Murray (20), and Rind *et al.* (21) were attacked only after publication. Many researchers (42%) described how their own work had been targeted for censure. One researcher was accused by activists of “murderous behavior” because he was incapable of reporting HIV+ subjects who admitted to unsafe sex practices in an anonymous survey. A sociologist published an article that undermined the central claim of a particular group, who allegedly then accused him of funding improprieties.

In other cases, the mere threat of social sanction deterred particular types of inquiry. Several researchers said that their choices to study yeast or mice instead of dogs were guided by fears of retribution from animal rights groups. As one respondent commented, “I would like to lunatic-proof my life as much as possible.” Drug and alcohol researchers reported similar fears, stating that they had not pursued studies that might provoke moral outrage.

Finally, there may be unspoken rules shared by the community. As one respondent stated, “every microbiologist knows not to make a more virulent pathogen.”

We failed to detect a coherent ethos regarding production of forbidden knowledge. Respondents at once decried external regulation and recognized the right of soci-

ety to place limits on what and how science is done. They stated that scientists are “moral” and “responsible,” but acknowledged cases in which scientists were sanctioned for acting outside the mainstream of their disciplines. They also said that, although information and “truth” had inherent utility, full and open publication was not always possible. Whereas most respondents worked hard to avoid controversy, others relished it.

In summary, formal and informal constraints have a palpable effect on what science is studied, how studies are performed, how data are interpreted, and how results are disseminated. Our results suggest that informal limitations are more prevalent and pervasive than formal constraints. Although formal constraints will bias science—by affecting what is studied and how it is studied—these biases are relatively transparent and amenable to political change. Informal constraints, in contrast, may be culturally ingrained and resistant to change, leaving few markers by which to assess their effects. We believe it is important to observe these constraints, assess their effects, and openly debate their desirability for science and society.

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### Supporting Online Material

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