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Warranted concerns, warranted outlooks: a focus group study of public understandings of genetic research

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Abstract

This paper discusses how the American public accounts for the concerns that they have about genetic research and the benefits that they foresee. We develop a general framework for discussing public claims about genetic technology based on Stephen Toulmin's model of warrants in argumentation. After a review of the results from public opinion polls about genetic research, we present a focus group study of public understandings of genetics. We outline the warrants, or publicly accepted "good reasons", that this group offers for accepting some aspects of genetic technology and for rejecting other aspects. The warrants presented by the public in their discussion of genetic research indicate that the public has a complex, informed understanding of genetic research, albeit a non-technical one. The paper concludes with a discussion of the importance of public participation in debates over genetic research and the ways that researchers and policymakers could adapt to public concerns about genetics.

Keywords: Genetic technology; Public opinion; Warrants; Public understanding of science; USA

Introduction

Judging by the movies, messing with the genome is a bad idea. Films such as *Godzilla*, *The Fly*, and *Attack of the Killer Tomatoes* show that animals, human, and vegetables attack when someone manipulates their genes. The creations of science fiction are unlikely to come into being. Nevertheless, these science fiction concerns indicate that not everyone is comfortable with new biotechnologies. Knowing what concerns exist and finding ways to adapt to them is important. Researchers in the United States often rely on public financial support to conduct their work. If the public's concerns about genetic technology are not addressed, this support may decrease. Similarly, despite excitement over potential pharmacogenomic medications, medical providers may find it difficult to prescribe these drugs if patients worry that taking them will limit their insurability and employability. To take advantage of genetic research, the public's concerns may need to be addressed.

The purpose of this paper is to examine public concerns in the USA about genetics technology. We begin by reviewing public concerns identified in the professional medical and genetics literature through the use of national telephone public opinion polls. Although these polls provide breadth by surveying a representative sample, they offer limited depth. To address these concerns, we provide the results of a focus group study. We then offer implications of publicly expressed concerns about genetic technology and directions for future research.

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Professionals diagnose public concerns

The public has a variety of concerns about genetic research and genetic technology. Although several investigators have found that the public is concerned about "improper" manipulation of the genome (Gottweis, 2002; Macer et al., 1995; Weiner, 2001), the range for what counts as "improper" is not clear. Although the ratings of acceptability reported by national publics vary, the standards used are often the same (Eisendel, 2000; Macer & Ng, 2000; Priest, 2000). Some genetic technologies are rejected on moral grounds, because they lack utility, or because they are too risky. Other applications may be judged moral, useful, and safe but be unwanted because the controller of the technology is not trusted. Although a given genetic technology might be scientifically possible, its use can become socially impossible.

In this essay, we are concerned not only with the public's *claims* about genetic research but also the *warrants* that they offer. Any argument can be divided into three parts. The first two are the claim—"the conclusion whose merits we are seeking to establish" (Toulmin, 1958, p. 97)—and the data—"the facts we appeal to as a foundation for the claim" (Toulmin, 1958, p. 87). Polling data outlines the claims made by members of the public. These claims come from populations that are exposed to similar messages and that share in a common culture. Nevertheless, these same data are used to articulate competing claims about genetics.

When competing claims rely on different kinds of data, differences of opinion cannot be resolved by presenting further data. "Our task" in resolving disputes, as argumentation theorist Stephen Toulmin (1958, p. 98) indicates, "is to show that, taking these data as a starting point, the step to the original claim or conclusion is an appropriate one". Toulmin calls these connections warrants. Claims and data may be articulated explicitly, but the warrants are often implicit. In judging the reasonableness of an argument, the warrant may need to be extracted in addition to the data. For an argument to be reasonable, the connection made between the data and the claim has to correlate with some standard of evaluation considered acceptable to a speech community (McKerrow, 1990; Bates, 2003). Speech communities may consider several warrants to be equally valid ways of processing data, even if these warrants lead to different outcomes. Toulmin (1976, 1982) offers a non-exclusive list of warrants that are generally accepted across speech communities: reasoning from needs and interests, applying "natural laws" of ethics or morality, appealing to the text of legislation, providing statements of duty that devolve from a person's official or social role, employing appeals to authority, or reasoning through analogy, scientific methodologies, or logical deduction. Conflicts in conclusions can often be traced to differences in the data and warrants used. When arguing about genetics, genetic researchers may collect the data of microbiology and use warrants based on the scientific method to justify their claims. The lay public may use social knowledge and experiential data interpreted through analogic and inductive warrants to support their claims.

Attitudes expressed in polls

Public opinion polls are useful for outlining public understanding of genetic research. Although polls allow many responses to be collected quickly, Davison, Barns, & Schibechi (1997, see also Wellcome Trust 2000) have called for a deeper canvassing of the public to fill in this outline. These outlines have been filled in well by researchers in the United Kingdom, Europe, and Australia. Collectively, their findings indicate that public understanding of genetic research is not necessarily tied to technical knowledge (Henderson & Maguire, 2000). Moreover, an increase in available information about genetics does not translate into additional knowledge for most members of the lay public (Morris & Adley, 2001), nor does knowledge translate into acceptance (Eisendel, 2000). Instead of assuming that public understanding should be tied to factual knowledge, the public's ability to translate scientific accounts into personally meaningful information may be a better reflection of the public's understanding (Parsons & Atkinson, 1992; Kerr, Cunningham-Burley, & Amos, 1998). When this process of translation is investigated, additional depth is provided to public opinion poll data. Members of the public in the United Kingdom, Europe, and Australia are quite good at bringing personal frames of reference to bear on genetics (Barns, Schibechi, Davison, & Shaw, 2000; Davison et al., 1997; Kerr et al., 1998; Morris & Adley, 2001; Parsons & Atkinson, 1992).

Personal frames of reference often differ because of social standing and personal history. Thus, these frames can form competing lenses that can affect substantively a person's perception of genetics (Davison, Macintyre, & Smith, 1994). On a broader scale, Gaskell, Bauer, Durant, and Allum (1999) suggest that some societies may view genetics differently than others do because of their cultural sensitivities and national historical factors. This need to consider cultural sensitivities and historical factors is often backed by the higher support Americans lend to genetics than other publics (Davison et al., 1997; Gaskell et al., 1999). This difference is commonly assigned to different perceptions of governmental regulation, scientific practices, and health system structure between the United States and other states. Although the breadth of Australian, British, or European public opinion polls is often complemented by