The Normative Implications of Biological Research

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ABSTRACT One of the concerns that has plagued research on the biological and genetic underpinnings of social behaviors and individual differences is the fear that such information can be used for ill. This fear rests on a foundation of good reason. Early abuses involving the use of selective phrenology and other purportedly "scientific" methods to establish moral hierarchies among races or between sexes have exerted profound and lasting damage on society, as well as affecting later attempts to more productively examine the biological bases of individual difference. And yet, many policies that have focused exclusively on social factors have created equal pain and suffering, although these approaches have rarely fostered as much discussion. However, despite these negative outcomes, biological research can also attack diseases, alleviate suffering, and dispel social myths that wrongfully assign blame to the victim or otherwise oversimplify behavior. Here, we argue for a similar positive valuation of such an approach in political and social research. We concentrate not on the ethics of conducting this research, but rather the ethical need for this research to be conducted.

One of the concerns that has plagued research on the biological and genetic underpinnings of social behaviors and individual differences is the fear that such information can be used for ill. This fear rests on a foundation of good reason. Early abuses involving the use of selective phrenology and other purportedly "scientific" methods to establish moral hierarchies among races or between sexes have exerted profound and lasting damage on society, as well as on later attempts to more productively examine the biological bases of individual difference. Eugenics unquestionably constitutes a moral stain on the history of scientific efforts to provide systematic explanations for individual variance, but many other policies focusing exclusively on social factors have created great pain and suffering too, although these approaches have rarely received as much direct criticism. Some of the best examples of this kind of damaging research are the models that suggested that bad mothering was responsible for the development of schizophrenia and autism, diseases that we now know rest on some combination of genetic vulnerability and in-utero development. Interestingly, the ways in which biology and genetics can be used for good ends are rarely discussed in the social sciences; instead, the focus of this field is often directed toward how these areas of study could potentiate sexism, racism, and other social ills. But psychiatric genetics, for example, has maintained a focus on leveraging biological analysis to attack diseases and alleviate suffering, while at the same time striving to dispel social myths that wrongfully assign blame to victims and primary caregivers, or otherwise oversimplify behavior. We argue here for a similarly positive valuation of such an approach in political and social research.

Similar debates have occurred in the past. Darwin's early attempts to categorize humans as having evolved from species of

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related primates, such as great apes and chimpanzees, only served to aggravate the tendency for people to view science as hostile to humanity by implying an implicit hierarchy in evolutionary processes and categorizing humans as the highest form of life. Yet while clearly reflecting some of the particular cultural and racial biases of his time, Darwin did not deserve to be forever identified with some of the worst abuses of "social Darwinism." Indeed, he was careful to assert in *The Descent of Man* that no clear distinction exists among racial groups. Darwin himself fought for notions of equality, although his ideas were unfortunately widely and incorrectly associated with the phrase "survival of the fittest," which Herbert Spencer coined in 1864.

Later tendencies to attribute racist categorizations to Darwin's ideas of natural selection and evolution are actually primarily attached to eugenicist notions first perpetuated by Sir Francis Galton. Galton's story remains instructive as a warning for the pitfalls and challenges that can arise at the intersection of scholarly and policy debates. Largely viewed as the father of eugenics, Galton published his book *Hereditary Genetics* in 1869. A failed medical student, he took up mathematics and became captivated by the new field of statistics. By studying the family histories of famous men and searching for patterns, Galton came to believe that intellectual and other valuable qualities, like physical characteristics, had to be heritable. He argued that with careful marriage, human qualities could be improved through selective breeding, much like farm animals. His desire to create a regulated marriage market to strengthen human skills and abilities became known as positive eugenics. Galton's ideas of using science to measure and improve desirable human characteristics reached its perverse climax with the Nazis' attempt to eradicate Jews based on the outrageous claim that Jewish people somehow constituted a "lesser" race. The development of negative eugenics took on overtly racist tones with policies regarding the sterilization of minorities and the poor in the United States, particularly in the early twentieth century (Galton and Galton 1998; Galton 2005; Schulze, Fangeraub, and Propping 2004).

This perversion of science achieved additional notoriety with the rise of phrenology, or the study of the size of human skulls, and its later instantiations in measurements of brain volume. Samuel Morton, an early-nineteenth-century physical anthropologist, collected perhaps the largest group of human skulls from various racial groups. Based on his reading of skull size, Morton wrongly argued for the existence of significant racial differences in intelligence, with larger skull size translating into greater intelligence. This work received a great deal of criticism on methodological and theoretical grounds; indeed, there are no a priori scientific reasons why head size should be correlated with intelligence (Gould 1996).

More recent attempts to measure brain volume similarly find a small but significant relationship between the size of some brain structures and overall IQ, although none of these differences are correlated with racial differences. Some sex differences in patterns of relationships between brain size and IQ exist that are likely based on body size to weight correlation differences, but these differences do not correlate with overall levels of IQ (Andreasen et al. 1993). Rather, prenatal nutrition appears to be an important independent variable that influences head circumference (Ivanovic et al. 2004).

One of the troubling things about this history is not only that humans produced the scientific results they were prepared to find, but rather that the abuses themselves have continued to taint subsequent attempts to investigate biological and genetic differences among humans and explore how these differences may help explain important variance in attitudes and behavior. Many people have openly voiced concerns that such work might be used to perpetuate future abuses similar to those wrongs committed in the past. But such anxiety can be applied to all scientific fields and methods. Aspects of almost all economic, social, psychological, and physical approaches can be and have been used for nefarious purposes. This reality will likely never change. However, far less discussion occurs about how biology and genetics might be used to further positive ends; instead, the focus, particularly in the social sciences, almost always remains on how these fields potentiate the possibility for sexism, racism, and other social ills. In this article, we seek to offer some balance to these arguments and argue that genetics can prove a liberating as much as constraining field of study. After all, genetics has been able to demonstrate, among other things, that most racial differences in social behaviors are not "genetic" after all.

The irony of the automatic associations among biology, genetics, and the potential for misuse lies in the equally egregious abuses that can be laid at the feet of socialization models. Indeed, policies that focus exclusively on social factors have created as much pain and suffering as genetically focused policies. Perhaps the most obvious, if not the worst, example of such an abuse derives from early work on the origins of schizophrenia and autism. Although a deduction of biological or genetic causes for these disorders might have seemed obvious, given that the disease appeared to run in families and manifested a universal base rate across cultures of about 1%, scholars instead argued that the fault for schizophrenia could be laid at the feet of bad mothers. Specifically, it was claimed that refrigerator[1] mothers or mothers who placed their children in so-called "double bind" psychological situations were most likely to produce schizophrenic or autistic children (Bateson 1960). In reality, schizophrenia and autism are diseases that we now know derives from genetic vulnerability, epigenetic processes, and environmental conditions and are apparently unrelated to postnatal mothering. Similarly, until recently, homosexuality was considered a psychological disorder, and many etiological models implicated domineering and/or over-enmeshed mothers in combination with distant or emotionally detached fathers as the putative cause. This connection was, of course, far from true. Homosexuality is not a disorder, nor does its etiology have anything to do with parenting, although it does appear to be related to genetics, gene expression, hormones introduced in the womb, and other neurobiological factors (Kaminsky et al. 2009; Wilson and Rahman 2005).

In these cases and many others, differences were considered forms of psychological illness, and these "abnormal" behaviors were attributed to dysfunctional processes of socialization within the family. This social blame approach caused untold agony and guilt among numerous parents who believed that they had helped create their progeny's suffering. Now, genetic and neurobiological analyses have shown that, at least with regard to schizophrenia, autism, and sexuality, nothing could be further from the truth. Although parents may contribute to their children's disorders, such outcomes do not result from conscious action, but rather from genetic inheritance, epigenetic processes, in utero environments, and postnatal genetic and environmental interactions. Biological analysis has thus provided liberation in areas in which models of socialization had created turmoil and ignorance.

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The point here is not that models of socialization are always misguided or that biological models are always helpful; indeed, when placed in the wrong hands or used for malign purposes, or when poor research is conducted, each approach can prove disastrous or exploitative. Rather, we suggest that in the case of genetics and biology, ignorance does not constitute bliss. Choosing to not uncover the genetic or biological knowledge that it may be possible to learn puts scholars at a decided disadvantage over their industry, government, and other counterparts who systematically use this knowledge to serve their own designs and intentions. Indeed, a clear identification of the sources and expression of individual differences can help people to more properly see the ways in which they can be or are being manipulated by others, such as media elites, public policy leaders, and political decisionmakers.

We suggest that in the case of genetics and biology, ignorance does not constitute bliss. Choosing to not uncover the genetic or biological knowledge that it may be possible to learn puts scholars at a decided disadvantage over their industry, government, and other counterparts who systematically use this knowledge to serve their own designs and intentions. Indeed, a clear identification of the sources and expression of individual differences can help people to more properly see the ways in which they can be or are being manipulated by others, such as media elites, public policy leaders, and political decisionmakers.

The tobacco industry provides perhaps the best illustration of this phenomenon, although the mechanisms or processes of manipulation can just as easily be applied to insurance companies, political campaign managers, or pharmaceutical corporations that seek to sell policies or drugs for profit. Indeed, politicians and political parties use similar methods as businesses in trying to solicit donations and votes for their preferred candidates. In the case of the tobacco industry, many individuals worked long and hard to uncover the biological processes that enhance and maintain addiction in order to keep and expand their markets and sales (Glantz et al. 1995; Carpenter, Wayne, and Connolly 2005; World Health Organization 2008). By examining the human brain, tobacco companies were able to create a more addictive product that users would have difficulty foregoing. A class-action suit brought by 46 states against four of the major tobacco companies that was settled in 1998 and is referred to as the Master Settlement Agreement demonstrated the malicious and conscious manipulation of consumers at a huge cost to public health care systems.[2] The complainants were able to show that companies were exploiting biological factors for the express purpose of increasing demand and profit, thereby demonstrating the tobacco companies' clear intent to manipulate the public to its detriment.

Similarly, fast-food restaurants have conducted extensive research to find the most addictive combination of fat and salt for their recipes, particularly for French fries, to keep customers coming back for more (Schlosser 2001). Part of what makes these manipulations so challenging to overcome is that those who fall prey to their power are often unaware of them. Because the desire for sweet or salty food is at least partially innate (Birch 1999), agricultural groups that capitalize on this desire can profit at the expense of victims, who may attribute their subsequent weight problems and associated negative health outcomes solely to their own lack of willpower and not their unconscious exploitation by financially motivated capitalists. Already, some firms such as Neurofocus have begun to use biological information to improve neuromarketing, an attempt to improve marketing through an investigation of attention, memory, and emotion to anticipate consumer preferences. Through proper recognition of the underlying scientific processes involved, scholars of the biological and genetic bases of preferences and behavior can help consumers become more aware of the ways in which others may try to manipulate them for their own gain without the consumers' conscious awareness or participation.

Understanding the manifestation of these individual differences more fully can help create equality instead of fostering and perpetuating existing inequalities. Rather than adopt a one-size-fits-all approach to important policy issues, we can create more tailored programs designed to produce more effective results in more cost-efficient ways. Just as it would not be appropriate to prescribe one drug for every person suffering from a given condition, certain social interventions may not be suited for every population or individual. Carefully targeting a given program to those people who are most likely to benefit from it can enhance a project's effectiveness and save money. As long as the implementation of such policies remains transparent, strategic manipulation is less likely to occur, compared to situations in which such outcomes remain hidden in order to maximize effectiveness, as is characteristic with tobacco companies and corporations in general.

We offer a couple of examples of how such targeted interventions might improve cost and efficiency. First, not every student approaches education in the same way. In particular, recent research suggests that boys learn in ways that are manifestly different than girls. Specifically, physical activity and interaction remain integral elements of many aspects of male social learning (Gurian and Stevens 2007; James 2007). Thus, budget cutbacks that threaten recess, for example, exert an unintentional sex bias in effect, making it more difficult for boys than girls to learn in the absence of the regular outlet provided by physical activity. In less clear-cut categories, some individuals learn better by hearing information, while others process information more accurately with visual cues, and multi-modal stimuli appear to speed learning (Seitz, Kim, and Shams 2006). Allowing parents and children to select into the categories that work best for them can not only enhance the depth and quality of learning, but also reduce rates of truancy and absenteeism and perhaps even improve graduation rates.

Second, important health interventions work differently for individuals with the same diagnosed condition. For example, many people with diabetes need to lose weight. The conundrum

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confronting doctors and other health care providers concerns the best way to encourage patients to do so. Research indicates that all diets may work well initially, but that most people regain weight over time; similarly, certain diets work well for some people but not others. People can be divided according to the way in which their bodies process blood sugar, and thus can be assigned a more appropriate diet for their body type. Some individuals suffer from a "sugar addiction"; once this addiction is identified and the neurobiological elements of the addiction categorized, health care providers can develop an individually based program that may, for example, avoid carbohydrates and other simple sugars. Some individuals with this addiction tend to have success with the Atkins diets, on which, despite the high fat intake, they lose weight rapidly without hunger and with no ill effect to their cholesterol levels (Shai et al. 2008). Conversely, other individuals tend to suffer from more behavioral challenges, since they need to eat every few hours to keep their blood sugar steady. Such individuals also need to consume moderate amounts of carbohydrates to stave off hunger and lose weight and thus respond well to diets such as South Beach. However, if a doctor put such an individual on an Atkins diet, this person's cholesterol would likely skyrocket, leading to a failure to lose weight and a lack of subsequent motivation. Thus, awareness of individual differences can improve the specificity of targeted interventions in ways that can improve outcomes and reduce discomfort.

Examining the biological and genetic underpinnings of social and political behavior can enhance the prospects for social good as much as ill in the same way that models of socialization can be used to help or hurt those people who embrace them. It is crucial to recognize that regardless of scholars' attempts to ignore or reject biology because of past misuses, such factors will continue to be investigated and employed by people and groups seeking to manipulate the public for profit or other advantage. In these cases, knowledge constitutes the best defense, and conscious education can facilitate more cost-effective and beneficial social policies for everyone.

Because such information can and has been used for malign purposes in the past, we argue that we must use fire to fight fire. Those in the academy are positioned to balance the power and resources of private corporations or government agencies that might use such information for purposes inspired by greed or a need for endless supplies of fresh manpower to perpetuate conflict. The value of this research goes beyond simply understanding trait variation for its own sake, but its findings and implications can be used to protect the public, particularly by increasing awareness of the myriad ways in which such technology is being used for malign intent, and by generating remedies.

We have moved into an age of rich technological growth, speed, and sophistication in which a massive amount of information is being linked up without public knowledge. These interconnections are not being forged as they were in the past, when the public was aware of the need for confidentiality and laws ensuring privacy. In this new environment of ever-increasing technological interconnection and sophistication and instant global propagation of information, we need to build legal protections regarding the links being made to transmit personal information of which we are not aware. Certainly, corporations will use whatever means necessary to achieve decisive economic advantage, including the use of any and all biological information they can garner to determine influences on key behaviors of interest, such as those related to purchasing, website activity, e-mails, insurance claims, medical records, and pharmaceutical purposes. Every swipe of your supermarket rewards card, every pharmaceutical purchase, every website visited is recorded and used to build a profile. The analysis of such information occurs in every major industry in the private sector, and few groups outside of the academy are in a position to balance these forces by pursuing independent research and releasing their own results to the public. If scholars do not undertake biological research, this work will not take place in a rigorous and scientific manner. However, the research will still proceed, but will only be conducted by individuals or groups interested solely in profit or personal advantage; thus, private industries may use such information without the knowledge or willingness of the public, and few people will be able to provide an objective, unbiased, and scientifically rigorous counter to this influence. We believe that making this kind of biological and genetic research available to the public is an ethical obligation, which will allow the public and policymakers to decide how to use that information. The alternative to such a strategy will not prevent such information from existing; rather, information will continue to be used without our knowledge by those with intentions and purposes of which we are unaware and with which we may not agree.

We cannot claim that any research will lead to a good outcome or change anything for the better. But, as with psychiatric diseases such as autism and schizophrenia that were once attributed out of ignorance to bad parenting, we can formulate more effective remedies with better knowledge. While we now realize that the emergence of these illnesses has precious little to do with parenting, we do know that effective treatment can involve particular parenting strategies. This new understanding presents an interesting resolution: if these diseases are detected early enough, parents can become involved and the child will have better prospects for recovery. In this scenario, the primary caregiver is no longer blamed but empowered.

What would these ideas mean in a political context? The discovery of biological and genetic influences on political factors has tremendous policy implications for issues such as the kinds of legal protections mentioned previously. In addition, widespread recognition of such factors can influence how policy is made and might even influence the nature of political campaigns. For example, just as the Supreme Court decision in *Schenck v. United States* does not allow a person to falsely yell "fire" in a crowded theater because of the chaos that might ensue, we might consider whether it should be illegal to create political advertisements that are designed solely for the purpose of inciting public fear in order to gain partisan political advantage. Should candidates be allowed to use subliminal measures and fear-based strategies to incite particular reactions without public knowledge? Should public figures be protected from campaigns that hint at assassination or portray candidates in gun sights? Should political advertisements come with warnings, much like those that appear on cigarette cartons (e.g., "this commercial is intended to elicit an adrenaline release, thereby altering your behavior")? We do not know the answers to these questions, but certainly commercials created using scientific research and intended to influence the populace based on its biological predilections leave the public at a disadvantage relative to large special interests, unless academics without similar financially vested interests also work to inform the public of such effects.

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The questions that political science can help answer can also advance public debate on a wide range of topics, including such salient challenges as posttraumatic stress disorder, the high rate of suicide in the military, and health care reform. We are attempting to go beyond the kind of bioethical questions involved in challenging research programs such as stem cell research. We are focusing here not on the ethics of conducting this research, but rather on the ethical need for this research to be conducted. We believe that it is time to change the discourse from a focus on what is bad about biological research or how it might have been used for reprehensible purposes to concentrate on how to carry out this kind of research in as ethical a manner as we can, with the goal of protecting the public. Let us work to be sure of the long- and short-term implications of our work and how such research can be used and misused by various people, organizations, and governments for their own purposes. We must be self-conscious as we conduct this work, realizing that the path is difficult.

We may encounter dangerous shores to navigate. But just as Galton's warped attempt to improve the human species was further perverted by Nazis who wanted to destroy those groups that they deemed less fit, the recognition of such evil was necessary in order to halt its advance. As with alcoholism, recognition of the problem represents the first step toward conquering it. Work on the genetic and biological bases of political behavior is still ongoing, and if the academy moves to prevent scholars from producing and publicizing such knowledge independently, only the private sector is left to exploit such information. As a result, we deem it our ethical responsibility to make such knowledge available to the public, fully realizing that all research enterprises are flawed, but also believing in the value of accumulating knowledge over time. We remain optimistic about the value of the scientific enterprise to continue to discover information that can be used to help alleviate human suffering.

Quite possibly, much of what we find initially will prove incorrect or incomplete over time, but this reality makes our enterprise no different than any other scientific enterprise. And just as social science has been used to misguide public policy, so too can biological or genetic research be used wrongly, intentionally or otherwise. We remain fully aware of these concerns and as nervous about their potential misuses as our most ardent critics, but we also believe that we have no other choice, because by burying our heads in the sand, we ensure victory for the enemies of fully informed and open democratic discourse. ■

NOTES

1. The term "refrigerator mothers" was coined by Leo Kanner and promoted by Bruno Bettelheim in *The Empty Fortress: Infantile Autism and the Birth of the Self* (1972) to describe a style of cold parenting, lacking in any genuine kind of maternal warmth. He described children as "left neatly in refrigerators which did not defrost." Parents of autistic children were discussed as those who "just happen to defrost enough to produce a child."
2. This document can be found at http://www.ag.ca.gov/tobacco/pdf/1msa.pdf.

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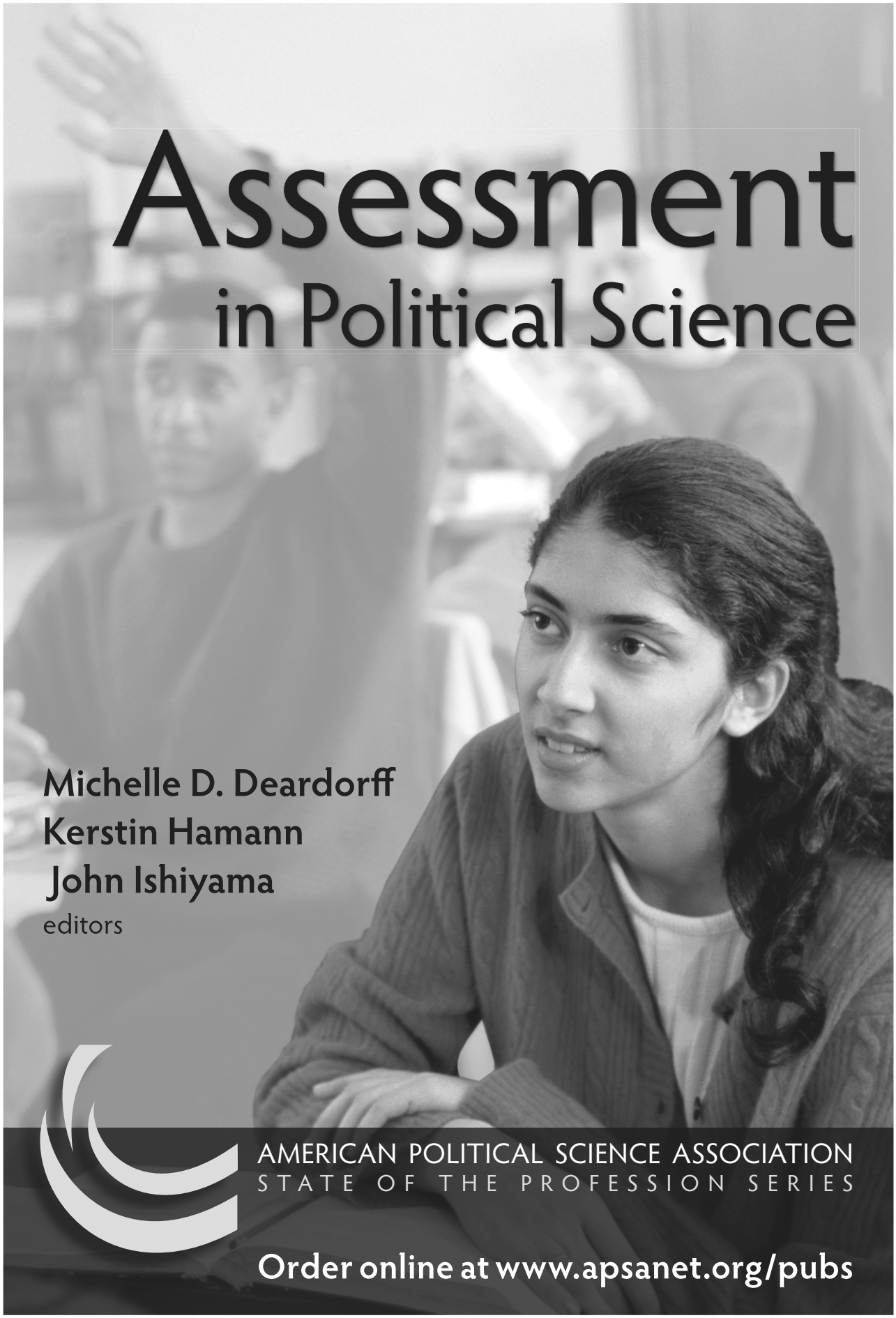
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