Social inference and occupational choice: Type-based beliefs in a Bayesian model of class formation☆

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ABSTRACT

Beliefs are a key motivator of individual behavior. As such, an understanding of how individuals' beliefs develop is a prerequisite to understanding decision-making and behavior. While rational choice theory posits a Bayesian framework for belief formation, status construction theories argue that beliefs are strongly influenced by status typifications. In this paper, we develop a Bayesian model of belief formation in which individuals use (irrelevant) information on others' observable type to bias their beliefs. This model is used to analyze a simple occupational choice setting, thereby shedding light on the micro–macro inter-relationship between observable type (e.g. race, gender) and social class.

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1. Introduction

Across disciplines, researchers have been concerned with the distribution and inequities of status, earnings, health and other components of socio-economic well-being. This research has not only focused on empirical analyses of educational and labor market outcomes, but also on developing theories aimed at understanding how these distributions change over time and are affected by both individuals' behavior and structural aspects of society.

Within this research, there have been two fundamental approaches to understanding the emergence of these inequities. The first, frequently used in sociological research, has been to focus on the structural and institutional aspects of society that lead to inequities. These include social hierarchies that perpetuate inequities (e.g., Ridgeway and Walker, 1995). The alternate approach, more typical in economics, has been to focus on micro-level, rational choice analyses of individual decision-making. As a result there has been little attention to the interrelationships between social structures and individuals' behaviors in shaping one another. Thus, we see the current study as building on the work of Baron and Pferrer (1994) who argue that

> Missing in most of the literature on reward distributions is any attention to the "micro–macro" connection – the links between social structures, institutions, and organizations, on the one hand, and, on the other, cognitions, perceptions, interests, and behaviors at the individual or small-group level. (p. 191)

Here, we begin to look at this micro–macro link between social structure and individual decision-making. Specifically we posit a model of individual belief formation and decision-making that ties together social structure and individuals' cognitions and self-perceptions. Our focus here is on the ways that structural aspects of society may influence individuals' beliefs, thereby affecting individual's behavior. In turn, these behaviors feedback on society's structures, changing the distribution of rewards (here, occupations) among the population. Thus our model is intended as a step towards developing a theoretical and analytical foundation for the needed micro–macro connection in social research.

Most decision-making takes place under some degree of uncertainty. For example, when undertaking an investment in human capital, individuals are uncertain not only of the return from this investment (e.g. via the job market), but also about their ability to

make the most of such an investment (e.g. their abilities or skills). Thus, an individual's beliefs play a significant role in determining her choices regarding education, occupation, and hence, social class. As such, understanding how beliefs develop is essential in understanding individual and group decision-making. We therefore focus on the ways in which social structures are internalized in individuals' belief processes. In turn, the behavioral manifestation of these beliefs shapes these social structures.

In this paper, we develop a theory of belief formation in which individuals incorporate irrelevant information regarding the distribution of observable types into their beliefs. Specifically, we use a simple occupational choice model to explore the consequences of individuals using information on observable type (e.g. race, gender) in forming beliefs about their own ability. Interpreting observable types as representing different social classes, our model follows closely along the lines of expectation states theories. These theories, developed by Berger, Cohen, and Zeldich (1972), argue that individuals and groups use "status relevant information" (e.g., race, gender) when engaging in tasks or making decisions affecting their own social status (e.g., education and occupational decisions). As a result, individuals may develop biases in their beliefs where they associate ability in a given status worthy task with the social status of their type (Webster and Foschi, 1988; Ridgeway and Erickson, 2000). These *type-based biases* can result in the evolution of endogenous classes and occupational segregation in which agents of different observable types choose different sectors of the labor market regardless of their private information regarding own ability. As a result, there is an inefficient matching of skills in the labor market and policies which alter the incentives faced by individuals of different types (e.g. redistributive taxation, affirmative action) may play efficiency enhancing roles.[1] Beyond the labor market, the process discussed here similarly affects occupational attainment, earnings behaviors, human capital formation and self-rated competence.

2. Related literature

Much of the analysis regarding beliefs has centered on the process of belief formation. For example, in economics the study of individuals' beliefs has focused on Bayesian learning mechanisms whereby individuals use observed outcomes (arising from their own experience or those of others) to update and refine their subjective beliefs. On the other hand, sociologists often cast beliefs as the result of socialization processes or the internalization of behavioral norms. In either case, differences in information or the social environment will lead individuals to form different beliefs and therefore choose different behaviors.

Given the import of belief formation, two key questions exist. First, how should models of belief formation characterize the use or internalization of new information? For example, in light of new information, do individuals use statistical methods to update beliefs or, rather, rely on heuristics and rules of thumb?[2] Secondly, what type of information is used in shaping individuals' beliefs? That is, given a task or event around which individuals have beliefs, what types of information do individuals use in updating their subjective probabilities regarding that task or event?

A frequent answer to the first question is to model belief formation through the use of Bayesian learning mechanisms. Bayesian models provide a tractable means of studying belief formation and have seen frequent use in economics and game theory (see Jordan, 1991; Kalai and Lehrer, 1993; Piketty, 1995, 1998). Given their tractability, such models are increasingly finding support in sociology and psychology (for example, see Breen, 1999). Further, while individuals frequently utilize heuristics when making decisions (Gigerenzer and Todd, 1999), there is experimental evidence that individuals' beliefs, especially when they are the outcome of group processes, can approximate the outcome of Bayesian learning mechanisms (see, for example, Cox, Shachat, and Walker, 2001).[3]

The answer to the second question is more complicated. Research in psychology and economics has demonstrated that individuals often use information in conflicting ways, using seemingly irrelevant information to anchor or justify their beliefs. For example, Tversky and Kahneman (1974) demonstrated how obviously irrelevant information (the spin of a wheel) could influence individuals' judgements (estimates of the number of African countries in the United Nations). As a result, individuals with initially identical prior beliefs and information may arrive at very different subjective beliefs as they incorporate information in inappropriate or contradictory ways. Most germane to our purposes, the theory of status characteristics and expectation states (Berger et al., 1998), the theory of stereotype threat (Steele and Aronson, 1995), and status construction theories (e.g. Berger, Ridgeway, and Zelditch, 2002; Ridgeway, 1991) posit that individuals' beliefs may incorporate information on social hierarchies and the observable characteristics of others, even when such information is irrelevant to the object of their beliefs.

Following Berger, Cohen, and Zeldich (1972) and Berger et al. (1998), an individual of low social status may negatively bias her beliefs about success in a status worthy task (e.g. success in education or employment). Their formulation of expectation states theory argues that individuals will sort themselves into social hierarchies (often based on wage or occupation) that are manifest through individual choices of and participation in social groups. Alternately, as in Steele and Aronson (1995), individuals may internalize stereotypes based on observable criteria when engaging in an activity within a group of individuals of different observable types. Similarly, Ridgeway (1991) uses expectation states theory to discuss how the salience of a status attribute can lead beliefs to be dominated by status typifications: beliefs about individuals' abilities and qualities that are based on their status characteristics (here, gender).

Empirically, there is ample evidence that individuals use information on social statuses to bias their behavior in various settings. For example, Ridgeway and Bourg (2004) find that activating gender as a salient social characteristic can lead men and women working in mixed gender groups to behave in greater leadership (men) and egalitarian (women) roles. Similar results have been documented in small group interactions in the field (mixed gender police teams, Jemmott and Gonzalez, 1989) and with respect to performance on tests of mental aptitudes (Lovaglia et al., 1998; Shih, Pittinsky, and Ambady, 1999). Within experimentally constructed groups, Ridgeway and Erickson (2000) and Ridgeway et al.

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[1] In this context, the model presented here is related to models of statistical discrimination (Arrow, 1973; Coate and Loury, 1993; Phelps, 1972). The key difference here is that our object of interest are *employees'* beliefs about their abilities rather than *employer's* beliefs about employees' abilities. See Section 5.

[2] Gigerenzer and Todd (1999) and others have argued that the use of heuristics may, in many circumstances, by optimal.

[3] Of course, Bayesian learning does not necessarily imply that individuals choices are correct. As addressed in the literatures on herding and information cascades (in which individuals incorporate observable information on the actions of others) Bayesian learning may lead to individuals conforming to the decisions of others, even when their private information would imply a different course of action (Banerjee, 1992; Bikhchandani, Hirshleifer, and Welch, 1992).