Social Macroeconomics

Working Paper Series

Striving for balance in economics: towards a theory of the social determination of behaviour

Karla Hoff, World Bank
Joseph E Stiglitz, Columbia University

RebuildingMacroeconomics

ESRC ECONOMIC & SOCIAL RESEARCH COUNCIL

GLOBAL SOLUTIONS
THE WORLD POLICY FORUM

Striving for Balance in Economics: Towards a Theory of the Social Determination of Behavior
Karla Hoff and Joseph E. Stiglitz
NBER Working Paper No. 21823
December 2015
JEL No. A12,D00,D01,D03,D20,D50,Z13

ABSTRACT

This paper is an attempt to broaden the standard economic discourse by importing insights into human behavior not just from psychology, but also from sociology and anthropology. Whereas the concept of the decision-maker is the rational actor in standard economics and, in early work in behavioral economics, the quasi-rational actor influenced by the context of the moment of decision-making, in some recent work in behavioral economics the decision-maker could be called the enculturated actor. This actor's preferences and cognition are subject to two deep social influences: (a) the social contexts to which he has become exposed and, especially accustomed; and (b) the cultural mental models—including categories, identities, narratives, and worldviews—that he uses to process information. We trace how these factors shape individual behavior through the endogenous determination of both preferences and the lenses through which individuals see the world—their perception, categorization, and interpretation of situations. We offer a tentative taxonomy of the social determinants of behavior and describe results of controlled and natural experiments that only a broader view of the social determinants of behavior can plausibly explain. The perspective suggests new tools to promote well-being and economic development.

Karla Hoff
World Bank
MC 3-301
1818 H St NW
Washington DC 20433
khoff@worldbank.org

Joseph E. Stiglitz
Uris Hall, Columbia University
3022 Broadway, Room 212
New York, NY 10027
and NBER
jes322@columbia.edu

1 Introduction

Kenneth Arrow reminded us that the standard economic theory of individual and firm behavior was actually a theory in which *social determinants* —factors not attached to particular individuals but instead to social groups—were crucial (Arrow 1994). Standard economics considers only the social determinants of choice sets: prices and the rules of the game. The social determinants of decision-making are left out, since the core theory used in standard economics assumes rational actors with stable, coherent, and autonomous preferences, who are certainly not affected by social context.

Recent research in *behavioral economics* has broadened our understanding of how individuals make choices. Exploring the psychological influences on behavior, this research has shown that the context *of the moment of decision-making* influences choices even when the context should be transparently irrelevant to the decision (Tversky and Kahneman 1974; Moscovici 1985; Ariely, Loewenstein, and Prelec 2003). For example, the context can make prescriptive norms against theft focal in attention and thereby reduce theft, or make a descriptive norm of frequent stealing focal and thereby increase it (Cialdini et al. 2006). Also, peers in a college (among men, a randomly assigned roommate) or peers in a workplace can lead an individual to change his behavior to match theirs more closely (Kremer and Levy 2008, Herbst and Mas 2015). The social factors in these examples would not affect behavior under standard economic theory. Insights into the social determinants of behavior can be used to *shape* it: individuals can be *nudged* to take one action or another (Thaler and Sunstein 2008). The Obama administration has actually used these ideas as instruments of policy (Executive Office of the President, 2015).

This paper discusses another strand of behavioral economics. This strand recognizes durable social influences on preferences and cognition. It recognizes that past social experiences and past social structures can result in sustained ways of conceptualizing a situation and, hence, sustained social outcomes—for example, high mistrust, a sharp gender division of labor, or a high level of violence in disputes that might seem trivial in origin.[1] The key variable that sociology and psychology have introduced to explain systematically biased uses of information are *mental models*, which are the tools that people use to process information and conceptualize. Mental models (sometimes called *schemas*)

---

[1] These examples are discussed, respectively, in Nunn and Wantchekon 2011; Alesina, Giuliano, and Nunn 2013; and Cohen et al. 1996. Early work that emphasized the biased processing of information using cultural beliefs (cultural mental models) includes Akerlof (1989), North (1990), and Denzau and North (1994).

include concepts, categories, social identities, narratives, and worldviews.[2] They "shape the way we attend to, interpret, remember, and respond emotionally to the information we encounter and possess" (DiMaggio, 1997, p. 274).

An individual may have in his mind multiple mental models that he can draw upon to interpret the situation he is in, and some may be inconsistent in content and in implications for behavior (D'Andrade 1995, Swidler 2001). What determines which one is selected? As DiMaggio (1997, p. 275) notes, "selection is guided by cultural cues available in the environment." Thus the social variables that behavioral economics introduces into decision-making—the social context of the moment and mental models— interact.

The analysis described so far is simply an elaboration of the standard behavioral economics model, explaining in greater depth, for instance, how certain "nudges" might work. This paper argues that the social context not only primes individuals, eliciting one kind of behavior or another, but that in a fundamental sense it shapes them—how they think and what they want. It *creates* the set of mental models upon which individuals can draw and affects the circumstances that prime alternative mental models.

This durable shaping of individuals is the distinction between the work on which this paper focuses and earlier work in behavioral economics whose central interest were reasoning biases that were typically thought of as universal and hard-wired. It is not just that the social context of the moment of decision-making influences behavior by making certain norms, role models, or reference points focal in attention. In a sense, prolonged (and sometimes even brief) exposure to a given social context shapes *who people are.*

Parents know this: they worry about who their children associate with. Parents send them to schools where they will be inculcated with the values that the parents respect. But while the influence of social context on preferences and, thus, the endogeneity of preferences, seems patently obvious, the implications for economic behavior have, for the most part, been ignored.

---

[2] Not all mental models are cultural. Some are idiosyncratic representations that a single individual created; for example, the mnemonic for a lock combination. Other mental models, such as basic object categorization, are innate. Humans may also be innately attuned to the category of "dangerous animal" (Bregman 1934). But the mental models of interest in the social sciences are cultural.

The following story illustrates the issue. We can imagine that people are born with many different kinds of actors inside them. Consider an individual, Fred, and call two of the potential actors inside him A and B. Let A be a scrupulously honest person and B be a less scrupulously honest person. An insight of modern behavioral economics is that Fred can be induced to act more or less scrupulously by changing the cues to which he is exposed. We say that Fred is primed to be A or B. At any given moment, it may be easier to prime Fred to be A than B.

But now having gone to work for an international bank in a period when social norms against dishonesty towards clients are lax, the set of stimuli that elicit Fred to behave dishonestly expands. This changes who Fred is. In general, after being embedded in a new context for a long time, an individual can become more B than A.

Racism is an example of a behavior that no one is born with but that is learned (Kinzler and Spelke 2011). A society can create a mental model of racial hierarchy and represent it as describing the world objectively. Children growing up in that world are exposed to that mental model, and it almost surely becomes one of their mental models as an adult. It is a culturally created mental model. A segregated and unequal society will constantly prime it.[3] An individual brought up in a racist society will make certain decisions and certain choices. This culturally created mental model changes the individual's preferences, cognition, and behavior from what they would have been had the individual never been exposed to it

As we discuss in this paper, culture is the focus of a rapidly growing strand of work in economics.[4] Since individual preferences/behavior (say, in confronting a particular choice set) are endogenous and influenced by the social context, including the actions and beliefs of those around the person, culture itself is *endogenous*. In some cases, economists can "solve" for *equilibrium cultures,* that is

---

[3] The set of possible mental models is infinite. There are an infinite number of ways to think and in the case of a given individual, most have zero weight. The set of possible mental models is not well-defined.

[4] Research on culture has also created new subfields outside of economics—cultural psychology (e.g., Bruner 1990, Fiske et al. 1998, Heine 2012) and cognitive sociology (e.g., DiMaggio 1997, Zerubavel 1997). The new field of cultural neuroscience examines the impact of experience and culture on brain development (see section 5 below). A definition of culture in these subfields emphasizes that individuals rely on cultural mental models to process information. Culture is defined as the interaction between (i) mental models (schemas), which make some ideas more accessible than others, and (ii) cues in the environment that activate particular mental models: "In schematic cognition we find the mechanisms by which culture shapes and biases thought" (DiMaggio 1997, p. 269). But much work in economics on culture does not emphasize the human dependence on cultural mental models to process information; a recent review is Alesina and Giuliano (2015).

cultures that give rise to behaviors that are self-sustaining—or would be in the absence of any exogenous events.

Because the environment shapes human cognition and behavior so deeply, habits of thought and behavior can be culturally transmitted across generations (e.g. Algan and Cahuc 2010; Alesina, Giuliano, and Nunn 2013). The result is that there can be societal rigidities; it may be difficult to change culture.

At the same time, we will see that historical situations and events can also have path-dependent effects (Herlihy and Cohn 1997, Nunn and Wantchekon 2011). But there is no teleology. As Darwin pointed out, there are evolutionary dead ends. Even taking account of history, there may be multiple (social) equilibria, and one of them may Pareto-dominate others.[5]

Social identities and norms are an essential part of what it means to be human. However, some social identities and norms can emerge that marginalize certain groups or are good for almost nobody – for example, the norm in traditional India of *sati* (widow-burning), female genital mutilation, and child marriage. In cases in which norms lead to obviously perverse outcomes, interventions that shift the mental models and norms can be empowering, at least for certain groups.

At one time, economists could relegate the issues we are discussing here to sociologists—concepts like social identity might be important for explaining social interactions, and perhaps even political choices, but not for economic behavior. Just as economists have had to come to terms with the fact that individuals act in ways that are markedly different from those predicted by the *rational actor model,* economists will have to come to terms with the fact that preferences and cognition are shaped by those surrounding us, and that these social interactions may be as important determinants *of economic outcomes* as the variables upon which economists have traditionally focused. The social influences on the nature of the individual are no longer beyond the boundaries of economics. Instead, social determinants of preferences and cognition are increasingly demonstrated in empirical work on individual choice and societal change. The broader perspective expands the explanatory power of economics and the accuracy of economic predictions. Most importantly, this perspective identifies

---

[5] This is a general property of evolutionary models; see, e.g. Hoff and Stiglitz (2001). But as the analysis below shows, standard welfare analyses may be of limited relevance when preferences are endogenous. What is clear is that there are significant distributive consequences of alternative equilibria.

sources of societal rigidity that the standard model takes no account of, and identifies new instruments that can influence behavior and long-run social change.

1.1 Going beyond the Robinson Crusoe economy

One of the paradigms within standard economics has been the Robinson Crusoe economy. Understanding the limitations of that paradigm enhances understanding of the difference between the line of research described here and other strands of work in conventional and behavioral economics.

A central feature of the Robinson Crusoe economy is the absence of social interaction. Therefore none of the issues that we have discussed here can arise in a Crusoe economy, but many of the insights of behavioral economics do apply. Work in behavioral economics demonstrates that much of our behavior is not consistent with rationality: Robinson Crusoe, living along on his island, may suffer from c*onfirmatory bias* or *anchoring* or any of the other of the multitude of universal, hard-wired reasoning errors that modern behavioral economics have identified (Kahneman 2003, 2011).

Interestingly, the standard economic narrative of Robinson Crusoe ignores an important part of Daniel Defoe's parable. Even on this isolated island, there is a society; Crusoe is accompanied by his man Friday. Defoe's story tells us much about their social interactions. Although Friday's capabilities are better suited than Crusoe's to the economic challenges posed by the island environment on which the men have landed, their hierarchical relationship persists. Standard economic theory could not easily account for this. But models of sociology and anthropology would find no puzzle: Friday and Crusoe have naturalized the status they each held before arriving on the island. It has become part of their identities. Friday would perhaps feel as uncomfortable giving orders as Crusoe would feel receiving them. The society they came from has shaped their identities and preferences.

1.2 A schematic representation

Table 1 gives a taxonomy, with examples, of the social determinants of behavior in three types of economic literature: (1) standard economics with the *rational actor* with fixed preferences; (2) behavioral economics with the *quasi-rational actor* with fixed preferences, including a preference for

7

conformity; and (3) behavioral economics with the *enculturated actor*[6], who has endogenous preferences, perception, and cognition.

Note that columns (1) and (2) have in common the assumption of fixed preferences, but column (2) introduces the new idea of "fast thinking." For most decisions, individuals use an automatic, intuitive, and associative mode of thinking ("fast thinking"), rather than a deliberative, reflective, and effortful mode ("slow thinking"). Fast thinking generally draws on only a small part of the relevant information. By affecting the salience and accessibility of information to the decision-maker, the context of the moment of decision-making affects his behavior.

Columns (2) and (3) have in common that people may be irrational, but column (3) introduces the additional notion that people process information using *cultural mental models*. An individual may be able to draw on one of several mental models that differ in their implications for action. Hence, even deliberative thinking can lead to irrational behavior, at least as conventionally defined.[7]

---

[6] The term is used by Heine (2010, p. 1423).

[7] For example, the sociologist Alfred Schutz (2013[1953], p. 22-23) writes that " 'rational action' on the common-sense level is always action within an unquestioned...frame of [social] constructs…Thus we may say that on this level actions are *at best partially rational*…" (emphasis added). The sociologist Mary Douglas argues that "individual minds are furnished with culturally given attitudes" (1986, p. 122), which individuals cannot easily recognize (see also pp. 76, 83, 126). Economists use the term "rational actor" not to suggest a high level of thinking, but only to mean a certain kind of consistency in behavior. The fact that experience and exposure can change the mental models (schemas) that an individual uses, and thus his framing of a given situation and the decisions he makes, will lead to behavior that violates consistency.

Table 1. Standard economics and two strands of behavioral economics

	STANDARD ECONOMICS	BEHAVIORAL ECONOMICS	
	(1) **The rational actor** ■ Fixed, autonomous preferences	(2) **The quasi-rational actor** ■ Fixed preferences, including a preference for conformity ■ "Fast thinking"	(3) **The enculturated actor** ■ Peer influences and "fast thinking," as in column (2) ■ Endogenous preferences and cognition ■ Perceptions that are not an unchanged or literal copy of the environment, but are simplified and transformed by social constructs (cultural mental models)
Concept of the actor			
Disciplinary foundations	Rational choice axioms	Evidence primarily from psychology (cognitive and social)	Evidence primarily from psychology (including cultural psychology), sociology, and anthropology

What are the social drivers of behavior?	Incentives
	
	■ Prices
	■ Rules of the game
		Incentives, as in column (1)
		
		Context in the moment of decision-making, e.g., the way in which choices are presented and the norm that is focal in attention
			Incentives, as in column (1)
			
			Context in the moment of decision-making, as in column (2)
			
			Experience and exposure, which
			
			■ Affect responses to particular primes
			■ Create mental models—the lenses through which the enculturated actor sees the world, e.g.,
			  ■ Categories
			  ■ Concepts
			  ■ Social identities
			  ■ Worldviews, and
			  ■ Narratives.

1.3 Outline of the paper

The objective of this paper is to provide a tentative taxonomy of the social determinants of individual behavior, going beyond Arrow's analysis of the social determinants of choice sets to the social determinants of the process of making decisions.[8] We contrast that taxonomy with the social determinants of behavior in standard economics and in behavioral economics that studies quasi-rational agents with fixed preferences.

In the standard models, the social determinants of behavior are prices and the rules of the game. Standard economics—that is, economics with fixed and self-interested preferences and rationality—*can* take into account social preferences. For example, standard economics can easily allow that individuals may be fair, altruistic, or spiteful. They may enjoy interacting with others. In the expanded standard model, the social determinants of behavior are not merely prices and the rules of the game, but also the welfare of others and certain elements of their consumption. This is the subject of section 2.

Early work in behavioral economics relaxed one assumption of standard economics—full rationality. It allowed that the context in the moment of decision-making could shape how an individual construed himself and his choice set. For example, what identity, role models, reference points, or norms were salient to him at the moment of decision? A seemingly irrelevant change in the context could lead to preference reversals. Rabin (1998) and DellaVigna (2007) review this work. Section 3 reviews, very selectively, socially determined behavior in that framework.

In the strand of behavioral economics on which this paper focuses, additional social determinants of behavior are experiences and exposure. They shape mental models, which in turn affect how an individual experiences what he experiences. Both preferences (section 4) and cognition (section 5) have social determinants. Cognitive processes that psychologists once believed to be universal are now understood to be shaped by experiences and exposure.

But the social context is just "other people." It is thus natural that section 6 addresses issues of equilibrium and dynamics. Because individuals' beliefs and preferences are dependent on others', society can exhibit rigidities. To overcome the rigidities, one has to simultaneously change the beliefs of large numbers of individuals. But this sometimes happens. We give examples in which an

---

[8] Bowles and Polania-Reyes (2012) provide a somewhat different taxonomy.

exogenous change in context (political reservations for women as village leaders in randomly selected villages in India, the mobilization of poor women in self-help groups in a few regions of India, and exposure of different areas of Brazil to soap operas in which all the female characters had few or no children) caused more-or-less simultaneous mental model switches by many interdependent actors and, thus, led to substantial behavioral changes that may help sustain the initial exogenous change in context.[9]

The paper describes laboratory, field, and natural experiments that we believe provide convincing evidence of observed behavioral changes that are markedly different from what standard economics would predict. There are social impacts on behavior that *cannot* be accounted for only by changes in choice sets and information, but that are best understood as changes in preferences and socially-determined cognition. Section 7 discusses the normative considerations raised by policies that try to affect individuals' mental models, and section 8 concludes.

2 Interpersonal effects in standard models: Interdependent utility

This section summarizes the way that standard economics incorporates social determinants into choices. It does this by allowing others' consumption to directly affect one's own welfare. It retains the assumption of standard economics that the individual's preferences and ways of processing information are *fixed*—that is, unaffected by social elements. Behavior is described as if the individual maximizes a fixed utility function defined over his own and possibly others' consumption (actions).

For many decades, economists worked on enriching the standard models while retaining the core assumption of fixed preferences and a fixed way of processing information. It is straightforward to extend this framework to include the consumption of others:

2.1   Max U^i ($\mathbf{x}_i$, $\mathbf{x}_{-i}$**).**

       $\mathbf{x_i}$

---

[9] The three examples are, respectively, from (a) Beaman et al. 2009, 2012 and Iyer et al. 2012; (b) Sanyal, Rao, and Majumdar 2015; and (c) La Ferrara, Chong, and Duryea 2012.

The individual's utility in (2.1) depends on the vector of his own consumption $\mathbf{x}_i$ and that of others, $\mathbf{x}_{-i}$; there are externalities. With utility functions of this form, preferences—how an individual ranks alternative consumption bundles among which he chooses—depend in general on others' consumption, i.e. there is not separability, as in:

2.2. $\text{Max } U^i (\mathbf{x}_i, \mathbf{x}_{-i}) = u(\mathbf{x}_i) + \Phi (\mathbf{x}_{-i}).$
$\qquad \mathbf{x}_i$

Only in that case would the choices that the individual makes be independent of the choices made by others.

Equation (2.1) shows the general way that the standard theory might treat interdependent utility. By imposing more structure on preferences (on utility functions), we can go beyond this to make more precise predictions of behavior. We focus on two cases—where the individual's utility depends on relative consumption, and where his utility depends on *coordinated* consumption. A striking result in both cases is the effect on choices over leisure.

2.1. Relative consumption

Under the *relative consumption* hypothesis, the individual obtains pleasure from how well he is doing relative to others. Positional goods are valued because others cannot consume them. As Veblen once claimed,

> [I]n any community where goods are held in severalty it is necessary, in order to his own peace of mind, that an individual should possess as large a portion of goods as others with whom he is accustomed to class himself; and it is extremely gratifying to possess something more than others. (1899 [2007], 25)

An extensive literature explores the behavioral implications of this hypothesis.[10] Behavior can be markedly different from that predicted in standard models. For instance, in a model in which utility depends on the relative consumption of goods but the absolute level of leisure, the equilibrium level of leisure does not change when the wage rate changes.[11] Under some assumptions, an increase in

---

[10] See Stiglitz (2008) and Arrow and Dasgupta (2009) and the references cited therein. Between Veblen's early work and the more recent work of Arrow and Dasgupta and Stiglitz stands a considerable amount of macroeconomic work based on the "relative income hypothesis." See, e.g, Duesenberry (1949).
[11] Proposition B1 in Stiglitz (2008). This is true in the absence of wage inequality. A corollary is that changes in the wage do not change welfare in equilibrium, even though they change consumption levels.

wage inequality decreases aggregate leisure. In intertemporal extensions of this framework, Arrow and Dasgupta (2009) show that the dependence of utility on relative (conspicuous) consumption does not necessarily lower the savings rate.

2.2 Coordination utility

The utility that an individual obtains from consuming certain things depends on others' consuming similar things. We call this special case *coordination utility*. The enjoyment one gets from seeing a play or movie depends on the ability to discuss it with others, and this is best done if they too have seen the play or movie. Fads and fashions can be understood in a similar way: it is hard to conceive a single individual in isolation enjoying a hula hoop. The value of coordinating vacation time can also be understood in this way: the enjoyment an individual receives from a vacation day may depend on whether his spouse has the same vacation day. These examples highlight the social nature of what gives us pleasure. One important source of well-being are our interactions with others.[12] Patterns of consumption that enhance those interactions enhance well-being.

Stiglitz (2008) shows that there may be multiple equilibria. For example, if it is the norm for employers to give short vacations, the value of a longer vacation will be limited, so employees will not request (or value) longer vacations of their employers. But there can be another equilibrium with longer vacations. The latter equilibrium may generate higher levels of utility than the former.

2.3 Efficiency and collective action

In equation (2.1), individuals make choices focusing on only their own utility, i.e., they choose $\mathbf{x}_i$ to maximize U^i with no regard to the consequences for others' well-being. Obviously, the market (Nash) equilibrium in such an economy will not be efficient unless we can devise market mechanisms that force individuals to internalize the externalities, and that requires the creation of a large number of markets and associated property rights.[13] In this "system" an individual has to purchase the right to take an action that affects others' welfare. As Arrow (1969) observes, this

---

[12] See Putnam (2000)

[13] Traditionally, families have been modeled as if they maximize a family social welfare function, i.e. they fully integrate the impacts of the actions of each on others. More recent work on families, however, convincingly shows that models where family behavior is described by a repeated game (as described below) provide a better description of family behavior. Arrow's work on collective decision-making (Arrow 1963[1951]) shows that short of full integration of their preferences or one member of the family acting as dictator, there is no set of decision (voting) rules that lead to consistent behavior.

would be neither practical nor normatively feasible. Since impacts of person *i* on person *j* may be observable only to *j* (and possibly to *i*), this kind of simple Coasian solutions simply will not work.

However, social scientists have become aware of the more complex nature of many social interactions. Ostrom (1990) has, for instance, shown that in fact societies sometimes do design cooperative equilibria using repeated games to ensure that it is in the individual's *selfish* interest to be *other-regarding.* Her work is consistent with the large literature showing how cooperative equilibria can emerge in the context of games in which a group of players interact repeatedly. In the indefinitely repeated game, it can be in the self-interest of individuals to take account of how their actions affect others. Norms can be established.[14] It can even be in the self-interest of individuals to punish norm violators, including free-riders who shirk on punishing others' violations of norms.[15,][16] In these models, individuals are selfish and remain selfish. The repeated game provides *incentives* to act cooperatively.[17] Societies that have constructed repeated games to sustain welfare-enhancing cooperation are said to have high levels of social capital.[18]

But a disturbing implication of the social capital literature is that essentially any Pareto-efficient equilibrium can be supported, including equilibria entailing the exploitation of one group—such as African-Americans under Jim Crow. Those who violated the Jim Crow norm were punished. Discriminatory equilibria can persist.[19]

Policy restricting the set of variables that can be used as the basis of hiring can move the economy from one equilibrium to another. In such a policy, government intervention is very limited: all that is required is to prohibit certain actions. In the new equilibrium, it is not in anyone's interest to undertake those actions. Policy can thereby achieve social objectives at low or zero cost.[20] In these models, social context is important—far more important than in the case of the standard models, as discussed by Arrow (1994). Fundamentally, these models are not about how social interactions

---

[14] This is sometimes referred to as social capital.
[15] Abreu 1988.
[16] This section draws heavily on Kraft-Todd et al. (2015). See also the references they cite.
[17] It should be emphasized that the cooperative actions of some groups within society may work to the disadvantage of other groups. See below.
[18] Not surprisingly, there is a large formal and informal literature on social capital. See, for instance, Dasgupta and Serageldin (eds.), 2000.
[19] See Dasgupta (2011) and Acharya, Blackwell, and Sen (2014). These results are markedly different from those suggested by Becker (1957).
[20] See, e.g. Stiglitz (1974).

change preferences; rather they show how repeated "games" can change the *consequences* of the individual's action, thereby affecting incentives and the nature of the equilibria that emerge.

2.4 Societal learning and the evolution of preferences over time

As we have emphasized, a key characteristic of standard theory in economics is that preferences are fixed; they do not change over time. But the choices we make today depend on the choices that we have made in the past and on the choices made by others. It is not just that we learn what we like. Our way of perceiving the world can change. By experience, we can also become better at consuming certain things ("learning by consuming"). Because we get better at figuring out how to derive pleasure from the ownership/consumption of certain things, our demand for those things increases. At the most abstract level, this gives rise to a recursive structure to utility:

2.3   Max $U^i_t (\mathbf{x}_i^t, \mathbf{x}^t_{-i} ;\ \mathbf{x}_i^{t-1}, \mathbf{x}^{t-1}_{-i} ; \dots)$ + Max $\mathbf{\Psi}^i (\mathbf{x}_i^{t-1}, \mathbf{x}^{t-1}_{-i};\ \mathbf{x}_i^{t-2}, \mathbf{x}^{t-2}_{-i} ;\dots\dots)$

 $\mathbf{x}_i^t$ $\mathbf{x}_i^{t-1}$

where $\mathbf{\Psi}^i$ is the *direct utility* from consuming $\mathbf{x}_i^{t-1}$ when others consume $\mathbf{x}^{t-1}_{-i}$ and where U^i_t is the *continuation function*, i.e., the utility the individual will receive over the rest of his life given $(x_i^{t-1}, x^{t-1}_{-i})$ and given his "new choices" x_i^t and those of others.[21] An individual's marginal utility from consuming a particular good at time t is affected by his and others' consumption of that good at time t-1 and in all other previous periods.

In this model, individuals at time t-1 should think about the implications of their choices for the future. There is a sense in which our actions at one time shape who we are (defined by the choices we make) at later dates. Again, only in the case of temporal separability (i.e. how the individual ranks alternative consumption bundles is fixed over time) would that not be true.

Myopia and inefficiency. *If* individuals are myopic, they may not fully take into account how today's consumption affects the future. There is also a normative issue: at time t, their valuation of past consumption may be different from their contemporaneous valuation of that consumption. From a normative point of view, how should that earlier consumption be valued?

---

[21] It should be obvious that this formulation itself is not fully general. It assumes that I can describe the level of well-being I get from my consumption today independently of my future choices. But it may be that an individual describing his experiences *over his lifetime,* will evaluate current experiences in light of consumption that occurs after the date of consumption. The knowledge that he will do so will affect his consumption today.

This model, too, can give rise to multiple equilibria, as we discuss in the following application to choices over consumption versus leisure.

Learning and preferences. Societies that consume more "goods" may become better and better at consuming goods; those that start out enjoying more leisure may become better and better at that. Some societies may get trapped in a high-consumerism equilibrium.

It has been observed that over the past half century, large differences between US nationals and Europeans in consumption-leisure choices have developed. Europeans on the whole choose more leisure. Some 80 years ago, Keynes raised the question of how individuals would spend the *productivity dividend*—the fact that technological change permits us to meet the basic necessities of life in a few hours of work a week. The standard economic model provides no clear answer: there are income and substitution effects, the former suggesting more leisure since we are richer, and the latter suggests less leisure since the opportunity cost of consumption is so much lower. Forty-five years ago, there did not appear to be any systematic differences between the choices made by US nationals and Europeans. Today, there are.

Stiglitz (2008) puts forward several hypotheses for the behavioral differences,[22] some of them related to the models presented here. In particular, individuals can learn how to consume goods better, or to enjoy leisure better. Much learning is *social* learning—learning from others. Moreover, there is contagion of values: an individual may value goods more if others do.

Inequality, emulation, and societal behavior Individuals tend to emulate those who are viewed within their society as successful. They become role models, and there is again a social multiplier effect. In a society in which high value is placed on material success, the role models are the materially successful. Others will seek to follow their consumption patterns, reinforcing the value placed on material success.

In societies with a high level of inequality that have developed a high level of consumerism (a high value on the consumption of material goods, with one's well-being partly affected by relative consumption), those who are ahead will strive to distinguish themselves from the rest by working harder; those who are behind will strive particularly hard to keep up with the Joneses. This may lead

---

[22] There have been some attempts to explain these differences in terms of regulations or involuntary unemployment. Stiglitz (2008) argues elsewhere that those attempts are unpersuasive.

short-sighted individuals to get into debt—and there is evidence that this actually occurs, with indebtedness higher in communities with greater inequality.

This model, while it has gone beyond the standard assumptions of separability and independence, has been expressed totally in the language of standard economics. Some economists, for example Schelling (1984), have studied special cases of this model, e.g. addiction. The consumption of opium today affects preferences for opium and other goods tomorrow and later on.

Many of the reduced forms of the models presented below are similar to equation (2.3), even if the structural models—and therefore some of the points of intervention—are different. While in a formal sense, the individual in this model is "shaped" by his previous experiences, all of this is laid out at time 0. It is known at time 0 what his preferences will be like at a later date if he has certain experiences, including certain interactions. While, as we noted, much of the remainder of the paper can be reframed as special cases of this model, hopefully, the discussion in later sections will provide a far richer interpretation of how it is that social interactions (the social context) shape the individual. We will emphasize, in particular, the role of cognition. What matters is not so much what others do (as this model suggests) but how the individual perceives what they do and how he perceives the individuals themselves, and this is socially determined. It is affected by the individual's mental model. By changing mental models, we change behavior. Mental models can be changed by the behavior of others with whom we interact (e.g., as we see how role models behave), but it can, as we shall see, be affected by the behavior of others with whom we have no direct interactions (e.g., actors in a TV soap opera).

3 The impact on behavior of context in the moment of decision-making

As the previous section shows, it is not difficult to augment standard models to take account of individuals' other-regarding and social norm-regarding actions. But this is a limited view of how social elements affect behavior. It maintains the assumption that the decision-maker (a) is rational and (b) has fixed preferences: the structure of his utility function (even if socially oriented) is unaffected by others.

In the past quarter century, the new field of behavioral economics has emerged, showing that the economic model based on rationality does not provide an explanation of individuals' behavior in

many contexts. Individuals diverge *systematically* from rational behavior*;* they are, to use the title of Ariely's 2008 book, "predictably irrational."

This section focuses on how social context, e.g., social cues, are an important part of this predictably irrational behavior. To set the stage, we note that if Kahneman were to analyze the behavior of Robinson Crusoe on his island, he would easily identify aspects of his behavior that were irrational, i.e., subject to fast thinking. Crusoe might make systematic mistakes in judgment concerning small probability events, have confirmatory bias and loss aversion, and suffer from all the other biases discussed in that literature.
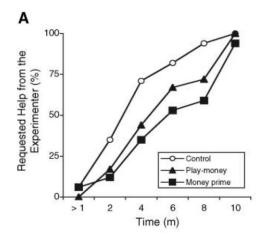
3.1 Intrinsic and extrinsic rewards

It has long been recognized that individuals act differently under extrinsic than under intrinsic rewards (see, e.g., Gneezy and Rustichini 2000 and Stiglitz 2000). "Money," the most important extrinsic reward, cues certain kinds of behavior—including more selfishness. In an experiment at the University of Minnesota, undergraduate subjects were randomly placed in one of three treatments, explained below: (1) *money prime*, (2) *Monopoly money prime*, and (3) *control* (Vohs, Mead, and Goode 2006). All subjects undertook a descrambling task: they were given nonsense phrases and asked to arrange the words into a sensible phrase. In the *money prime treatment*, one-half of the nonsense phrases included words related to money, while in the other two groups, all phrases were neutral. In the *Monopoly money treatment*, a stack of Monopoly money was placed in the subject's visual periphery. In the control, there were no primes to money.

After the descrambling task, the individuals in each group were given a difficult but solvable task. As the experimenter left the room, he told them that if they desired help, he was available.[23] Participants who had been given the money prime or even the Monopoly money prime worked longer before requesting assistance—see figure 1. There was no statistical difference between the treatments that used the money prime and the play money prime, but both were statistically different from the control. The authors replicated a version of the experiment and found consistent results.

---

[23] To confirm that the treatment activated the concept of money in the minds of the treatment group, all participants performed word-stem completion tasks. One-third of the word-stems could be completed with either money-related or neutral words (for example, CO _ _ can be completed as "coin" or "cord"). The money prime treatment group used more money-related words than the control group. Post-experimental questionnaires indicated that participants did not realize that they had been primed with the concept of money.

All that this experiment suggests so far is that thinking about money makes people behave with greater self-reliance. We will argue shortly that this is economically significant.

Figure 1. Percentage of participants who asked for help as a function of a money prime and the length of time that had elapsed while working on a difficult task

Source. Vohs, Mead, and Goode (2006).

There is also evidence that a money prime makes us less helpful to others—it makes us more selfish. The authors conducted the same descrambling task on students from the University of British Columbia, this time just with a money prime and a control. After the priming task was completed, the experimenter explained that she was an undergraduate who was looking for help coding data and she asked whether the participants would be able to help. She explained that each data sheet takes approximately five minutes to code. The subjects were left alone to indicate how many they would be willing to code. People who had been primed with the money condition volunteered about half as much time as the control group (25 minutes compared to 43 minutes). Versions of the experiment were replicated to explore generalizability, and consistent results were observed.

This example is useful in showing how an individuals' selfishness can easily be primed. But in some sense, it really belongs in the next subsection of the paper on the role of *social* context in priming: for money is a *social construction*. Robinson Crusoe living alone would not have need of money. This is the simplest example of a social construction affecting behavior. It induces the individual to think about his material needs.

We suspect, though, that similar results might be elicited by materialistic primes that are not (or not always) social constructions. Thus, if individuals were mildly hungry, then in societies in which individuals rely on individual efforts to obtain their food, a food prime would elicit more selfish behavior. By contrast, in hunter societies in which individuals have to cooperate to get food, one might hypothesize that there would be at most a weakly selfish response. To our knowledge, these alternative hypotheses have not been tested. However, in a later section we explain how the differences in the need for cooperation in growing two different crops, wheat and rice, have led to certain persistent differences in culture, which are reflected in both the mental models that individuals draw upon and their behavior.

Behavioral economics is replete with examples of how context and framing matter. These effects have been demonstrated not just in laboratory experiments, but also in the field and, more recently, even in policy, and they have generated extensive replication to test the generality of the mechanisms that underlie them. A field experiment in Kenya had results consistent with those of the money prime laboratory experiment. In Kenya, Dupas and Robinson (2013) gave all the subjects information about preventative health products and encouraged them to save toward investing in them. A randomly chosen group were given two additional things: a lockable box and a passbook that the individuals labeled with product for which they were saving. The intervention had large effects. The proportion of people who reached their savings goals was only one-third in the control group (without the box and passbook but with the encouragement) but one-half for those who also had the box and passbook. The amount of spending on preventative health products in the past 12 months was 66-75 percent higher for those with the lockable box compared to those with only verbal encouragement to save for health needs. How did the subjects manage to increase their spending on health products? Post-interview surveys suggest the lockable box and labelled passbook helped individuals to *mentally* allocate money for savings.[24] It also made them feel less obligated to share available money with others in need. A survey revealed that the group with the lockable box felt much less obligated than those without the box to share with others when their only available cash was in the box.[25] The mental accounting changed the way the subjects addressed both internal temptations and external pressures.

---

[24] This result is consistent with the "mental models" analysis presented later.
[25] Dupas and Robinson, pp. 1164-65.
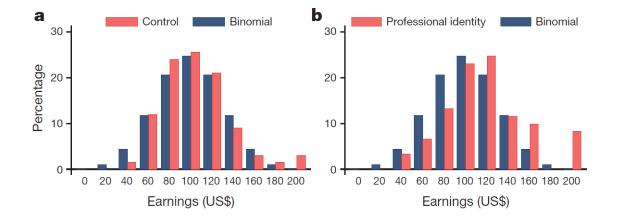
3.2 Social context and priming

Among the cues that can prompt irrational behavior are those associated with social context. Behavior is often best described *as if* individuals had multiple identities: distinct sets of beliefs, preferences, and behaviors. Social context affects which of these multiple identities is primed. The model of multiple identities, common in the psychological literature, is anathema to most economists, who are trained to view the individual as a unitary being, acting in a consistent manner when exposed to different choices. We suggest that there are at least some aspects of human nature that are more consistent with the psychologists' concept of the individual than with the concept in standard economics, even if the standard economic model of the unitary, consistent individual may be useful for many purposes, e.g. the choice between red and green lettuce.

A recent experiment shows that dishonest behavior is stimulated in bankers merely by priming them for their professional identity (Cohn, Fehr, and Maréchal 2014). Employees of a large international bank were asked to toss a coin 10 times and report the results online. Each winning toss could be worth $20. (Subjects were told that they would be paid only if the number of their winning tosses was at least as great as the number for a random player from the pilot study. In this way, researchers aimed to mimic the competitive environment of the banking industry.) Employees were more dishonest when their professional identity of bank employee was made salient by asking a small number of questions about their professional work in the pre-experiment survey. In figure 2, the darker bars in each panel show the distribution of returns if there is honest reporting of coin tosses. In the left panel, the lighter bars show the distribution of returns in the control group. In the right panel, the lighter bars show the distribution of returns in the treatment group, in which banker identity was primed. The lighter bars in the right panel are significantly shifted to the right compared to those in the left panel.

The behavioral change can be explained by norms of bankers that permit dishonesty, so that cues to an individual's identity as a banker increase dishonest behavior within the banker "compartment" of the individual's life.[26] Cues to banking have no such effect in the case of individuals who are not bankers.

---

[26] There is another explanation: earlier, we showed that simply priming an individual with "money" leads to more selfish behavior. Obviously, when one is a banker, one is constantly being reminded of money, so that it is not a surprise that a banker primed about banking would act more selfishly.

Figure 2. **Distribution of earnings predicted for a fair coin toss (binomial distribution) and the distribution of earnings by bankers without a prime (lighter bars in left panel) and with a prime to their professional identity (lighter bars in right panel)**

Source: Cohn, Fehr, and Maréchal 2014.

The findings are consistent with the hypothesis that social cues have a "programming" role on how individuals act. Anything that changes how individuals think may also change how they act.[27]

This experiment is instructive in several ways. The first way, which is the subject of the next section (section 4), is that it is possible that becoming a banker changes who an individual is. It affects his identity. There are a large number of aspects of his identity as a banker. Being part of the "culture" of banking may entail having strong beliefs that bankers should not be regulated; that governments are bad; and that when bankers behave badly, they should not be punished. A second implication of the experiment is that the banking culture may *inculcate* different norms—with greater approval of selfishness. This experiment has not tested this hypothesis—indeed, it does not even test whether bankers who have not been primed are more or less dishonest than non-bankers, though the results for the non-primed individuals suggest not. But we could imagine experiments that did test that (for

---

[27] There is direct evidence that the prime changed the thinking of the individuals, which is consistent with the theory of mental models described below. When asked to turn word fragments into meaningful words, the subjects primed with their professional identity of banker were more likely to generate bank-related words—for instance, turning the word fragment "_ _ oker" into "broker" as opposed to "smoker"—than those whose banker identities were not made salient. The professional identity treatment increased by 40 percent the frequency of banker-related words. This is just another instance of priming.

example, by an RCT with random hiring of otherwise similar individuals that ascertained behavioral changes after a period of being a banker).

What this experiment does show is that when individuals think of themselves as bankers, they consistently act in a more selfish way. (Those who go into banking may, on average, be more selfish, so observing more selfish behavior from bankers does not tell us that banking has *shaped* the individual.) The experiment suggests that, whether or not being a banker has changed an individual's *deep* preferences, when he is working in a bank, he is constantly being "primed" about banking, constantly reminded that he is a banker, and thus, he, and all of those around him, tend to act in more selfish ways.

It is easy to show, of course (Appendix A) that if those around one are acting in a dishonest and selfish way, it is optimal for one to act in a more dishonest and selfish way. Thus, being a dishonest and selfish banker is part of a social equilibrium. (As the literature on fast thinking has emphasized [Kahneman 2003, 2011], being primed can sometimes be viewed as simply part of "fast thinking." Fast thinking has the individual thinking of himself in a "banker equilibrium" in which being selfish and dishonest is the optimal way to behave.)

3.3 Other aspects of social context eliciting selfish behavior

There are other examples in which a change in social context elicits more selfish behavior. Gneezy and Rustichini (2000) describe an Israeli day care center that imposed a fine to induce parents to pick up their children on time. As Sandel (2012) points out, charging a fee (or imposing a fine) converted a social obligation not to be late into a conventional market exchange. The fine led to responses that were different from those anticipated (and predicted by the standard economic model): the fine increased the fraction of parents who picked up their children late. One can think of individuals as having a selfish identity and one that is more other-oriented. Which identity gets expressed depends on the framing. Framing a relationship as a cooperative venture primes the socially conscious identity; framing it as a monetary arrangement primes the selfish identity. The former framing proved more effective in motivating parents to be punctual. To put it another way, the pecuniary incentives were less effective than the social and intrinsic incentives that they had undermined.[28]

---

[28]We noted earlier the distinction between intrinsic and extrinsic rewards. There is a large literature on their relative efficacy (see, e.g., Stiglitz 2001, Gneezy et al. 2011, Bowles and Polania-Reyes, 2012, Ashraf, Bandiera, and Jack (2014),

4 Social determinants of preferences

The previous section of the paper explained how a prime could shift an individual's behavior markedly: the social context of the moment of decision-making could affect the actions the individual takes. But who the individual was, was given. The individual who had picked up his child on time from the nursery school without pecuniary incentives to do so was the same individual who picked up his child late when given a monetary incentive to be on time. No one suggests that in a deep sense this one exposure to financial incentives changed the individual's identity; it affected only how he behaved *in that particular social context*.

The remainder of this paper is about deeper social determinants of behavior, including those that change preferences and cognition—for instance, changes in the individual that affect how he responds to particular primes. In this section, we show that there are social determinants of preferences. This section differs from the previous two, which assumed that preferences were given. We argue that the "self" is not given, so that what primes or elicits certain behaviors is not fixed. (It still may be *predictable* how exposure to certain social contexts affects individual preferences, including the way individuals respond to certain choice sets and primes.)

As we observed in the introduction to this paper, who an individual is—his preferences and his identity or set of identities—is endogenous. His experiences can affect them. A child's "fast thinking" when exposed to a hot substance is affected by his learning from being burned.

Cognitive psychology describes automatic thinking and identifies biases, e.g., confirmatory bias, that are universal in form but not necessarily in content. Confirmatory bias says that I discount information, paying less attention to it, if it is not consistent with my prior beliefs. But it does not explain where those prior beliefs come from.

Some prior beliefs might be almost universal. The way that individuals treat rare events has universal consequences for a wide range of things that are rare. But if we were to change the environment in such a way that the rare event was no longer rare, then that event would not fall into the category of being rare (by definition) and its treatment would therefore differ. Robinson Crusoe living on an island in the Arctic would have come up with frameworks of thinking that were

---

and the references cited there and in World Bank Group 2015, chapter 2. Bowles and Polania-Reyes attempt to identify circumstances in which financial incentives "crowd out" or "crowd in" social incentives.

sensitive to that physical environment. His fast thinking would respond subtly to certain changes in cold weather, and be of little use if he were transported to a tropical island. And *vice versa* if Crusoe had spent years living on a tropical island, and then were suddenly transported to an Arctic island.

The physical environment thus affects individuals' fast thinking and even perception. (Indeed, Amos Tversky's original work grew out of observations about distortions in judging distance in a desert arising among individuals who had grown up in other physical surroundings.)

In this paper, we are concerned more narrowly with how social context affects individual preferences and cognition and, thereby, behavior.

4.1 Basic concepts

The previous section described how society as a whole primes certain social identities. But society as a whole does more than *prime* certain identities and worldviews. It validates them and the perceptions on which they are based. People seek approval of others and want confirmation that their perceptions are correct and that their behavior is, in some sense, appropriate. For the most part, the confirmation comes from *others,* from the fact that others in the individual's group, with whom he identifies, see the world similarly and share a similar set of norms.

Most importantly, society *creates* identities and worldviews. As we noted in the introduction, parents work hard to inculcate their values in their children. A child who is brought up to believe that littering is wrong is uncomfortable when he litters, not because he will be punished—he is uncomfortable even in situations where he knows it will not be detected. He comes to believe he is not that kind of a person.

The most obvious instances of the social construction of preferences arise in contexts in which individuals are relating to others, as in the relationship between Crusoe and Friday. As noted earlier, Friday would feel as uncomfortable giving orders as Crusoe would feel in receiving them. Crusoe's and Friday's identities were formed in a social context quite different from the island upon which they have been shipwrecked. But those identities continue, even as they seem inappropriate in the new situation.

To return to the banker example, we saw that when a banker was primed with his professional identity, he tended to behave differently. The *immediate* social context affected his behavior. An individual can again be thought of as having a number of *potential* identities; the social contexts in

which he was placed *in earlier periods* determine which of these identities is "expressed" or realized. Our hypothesis is that having spent time as a banker changes the individual, so that he is more likely to act in a selfish or dishonest way, *even when he is not in the context of banking or being primed about banking.* Many believe, as we noted earlier, that becoming a banker affects who the individual is in the fundamental sense that it affects the choices he makes in a variety of circumstances—even outside his profession and interactions with other bankers.[29]

Though the experiment that we reported does not test this hypothesis, an experiment on law school students provides suggestive evidence that exposure to ideology affects preferences. Fisman, Kariv, and Markowitz (2009) exploit a natural experiment in education—random assignment to instructors in the mandatory first-term curriculum at Yale Law School—in order to assess the effect on distributional preferences of exposure to different ideologies. The instructors in the first-term courses are free, and even encouraged, to design the syllabus as they see fit. The study focused on the instructors who taught contracts and torts, and identified differences among instructors on the basis of whether the instructor had a Ph.D. degree in economics, a Ph.D in a humanistic discipline, or only a J.D. degree. Traditional economics evaluates contracts according to the incentives they give people to deploy resources efficiently, whereas the humanities include a more egalitarian view of the role of contracts. The study finds that students exposed to instructors with economics degrees display greater preferences for efficiency (i.e., for increasing total payoffs) relative to those exposed to instructors with degrees in the humanities (who have greater preferences for equity). The study also finds that students exposed to instructors with economics degrees display greater selfishness than those exposed to instructors with humanities degrees; those exposed to instructors with only a J.D. degree exhibit intermediate selfishness. The findings are striking since the imposed exposure to ideology was relatively brief (one semester).

After presenting a simple model of endogenous preferences, we focus on the social determinants of selfishness and self-reliance.

A look ahead

---

[29] This is fundamentally different from how social capital, as conventionally defined, affects behavior; for as we have noted, in standard social capital markets, the social context affects individual's *extrinsic* or external payoffs, while here, social capital is the individual's sense of his own being, as he defines himself.

Perhaps the most important aspects of the social determination of preferences are interlinked with cognition and perception, for instance, of gender, race, and caste. These are discussed in section 5.

That an individual's beliefs and sense of self are a function of the beliefs and perceptions of others implies that there may be societal rigidities: even a dysfunctional Nash equilibrium may persist because of the difficulty of changing behaviors in a coordinated way. This idea is explored in sections 5 and 6. At the same time, perceptions can sometimes be changed in a coordinated way, and this opens up new possibilities for societal change. We give many examples (especially in sections 5.2 and 5.7).

4.2 A simple model of endogenous preferences/behavior

We consider an individual confronting a set of market constraints, represented by the prices (including wages and interest rates) at which he can buy and sell goods. The individual lives for two periods. We focus on his behavior in the second period. His behavior (choices) when confronted with prices $\mathbf{p}_t$ are then a function of his *experiences* in the first period of his life. The experiences that the simple model takes account of are his observations of the behavior of adults and, in particular, their choices, $\mathbf{a}_{t-1}$. Following our earlier formulation, individuals have multiple possible identities. The one that they become[30] is affected by the social context in which they are embedded. Thus for all individuals in a given society[31]

(4.1) $\mathbf{a}_t = H(\mathbf{p}_t, \mathbf{a}_{t-1})$.

Here, the individual's actions, $\mathbf{a}_t$, as an adult are affected by his observations concerning *all* the choices being made by all the adults, not just his parents.[32] In this general formulation, his parents or some other role model (e.g., the community leader) could have more influence than others, and there are specializations of (4.1) that can highlight such dependencies. Here we keep the analysis general. Focusing on the steady state, a social equilibrium is one where

---

[30] We avoid using the term "choose" because there may not be an element of conscious choice of which identity to "express." This formulation stands in contrast to that of Benabou and Tirole (2002), where individuals can effectively choose which of their multiple possible selves they become.

[31] This formulation ignores the non-social experiences. These can easily be incorporated into the analysis. Moreover, the way a child interprets the social context (behavior) may be affected by still other variables, which could be incorporated into the model.

[32] In the model, all face similar choices. The model can be extended to situations where different individuals confront different choice sets.

(4.2) $\mathbf{a}^* = H(\mathbf{p}^*, \mathbf{a}^*)$

$\mathbf{p}$ itself is of course determined socially, e.g., through market processes, summarized by the excess demand, $\mathbf{Z}$, of all goods equal to zero:

(4.3) $\mathbf{Z(p, a)} = 0.$

Any solution to (4.2) and (4.3) is a social equilibrium.

It should be obvious that there can exist multiple social equilibria. Even if *ex ante* the members of two different societies are identical, so they have the same potential to be selfish or hard-working or trustworthy, *etc.,* the two societies that actually emerge can be quite different. Slight variants of this idea are developed in the appendices and in the next two subsections.

4.3 Social determination of the susceptibility to priming

The previous section focused on how the social experiences of an individual (the social context in which he is embedded as a child) affects his *rational* choices as an adult. It is as if those initial experiences *determine* which of the possible selves an individual becomes. In a slightly more complicated formulation of the model, those experiences determine how an individual responds to certain primes, or stimuli (S), when he is in "fast thinking" mode. The stimuli include certain aspects of the social context at time t, but could also include many other primes. Individuals in fast thinking mode do not necessarily act the same way all the time. What we mean by endogenous preferences is that past experience makes it more *likely* that a certain identity will be expressed, given a prime S. We thus say that the probability, $\mathscr{P}$, of responding to prime S with action $\mathbf{a_t,}$ given prices $\mathbf{p_t,}$ is determined by "who the individual has become," i.e., by his past social experiences:

(4.4) $\mathscr{P}(\mathbf{a_t\,; S, p_t)} = H(\mathbf{p_t\,, a_{t\text{-}1}}).$

This would replace equation (4.1). By describing the set of stimuli to which individuals are exposed (the probability that an individual will receive a certain prime), we can complete the description of the social equilibrium.[33]

---

[33] The impact of an individual's observing a particular action in the first period on his second-period behavior could depend on whether the individual is behaving under "fast" or "slow" thinking (and, obviously, on whether the individual knows that and knows that the prime was related to the action). Sociologists emphasize the idea that what an individual has observed affects his mental models and dispositions in ways that are important for the reproduction or change of social structures.

4.4 Social determinants of selfishness and self-reliance

Part of the sense of self of many, if not most, individuals is that they are *not* selfish. The most important relations in individuals' lives are defined by emotional commitments to others that transcend self-interest.[34] Being described as selfish is a term of opprobrium—not a mark of respect of an individual who is just playing his role in achieving a Smithian equilibrium, in which social welfare is maximized (for given preferences and cognition) by each person pursuing his self-interest.[35] Even Adam Smith, whose celebration of the butcher's and baker's self-love is championed as the original exposition of the utility of self-interest, opened *The Theory of Moral Sentiments* with the claim that

> how selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it (2009[1759], p. 13).

Until recently, however, individual behavior that could not be explained as self-interested was deemed not to matter at the aggregate level (Fehr and Tyran 2005). Policies could thus be designed *as if* people were completely self-interested. But the policy relevance of pro-social behavior is now well recognized. For example, the political scientist Robert Putnam (1993, 2000), first in Italy and then in the United States, reported suggestive evidence that the strength of civic-spirited behavior is shaped by, and shapes, social outcomes—including crime, health, and the strength of the economy.[36]

Altruism and other pro-social behavior often emerge from feelings of *collective identity*. This is shown in experiments with the "dictator game." The dictator game is a two-person game in which only player 1, the "dictator," has to make a decision. Player 1 has to decide what share of a given amount of money to pass on to player 2. If, for example, the experimenter gives him an endowment of $10 and he gives a share of $3 dollars, then monetary payoffs in the game are $7 to player 1 and $3 to player 2. Obviously, purely self-interested players would choose to give player 2 a share of zero. When members of coffee-producer cooperatives in Uganda played a dictator game, they allocated more resources to anonymous members of their co-ops than to anonymous people from their villages who were not part of their coop (Baldassarri and Grossman 2013). By controlling for the

---

[34] There is more to this than reciprocity or "gift exchange," though relationships in which there are excessive imbalances may suffer as a result of perceptions of inequities and unfairness.

[35] One reason for this is that there are often large externalities. Externalities are pervasive, since they arise whenever there is imperfect information or incomplete markets.

[36] Putnam's work is often described as suggesting that there is more social capital in some places than others, but this kind of social capital is different from that described earlier in the context of repeated games.

effect of social proximity, the experiment illustrated the independent effect of group attachment on behavior. Leaders from the farmer group or a village group were more generous in their allocations toward members of the groups that they led.

Repeated interactions can sometimes create a collective identity and, thus, lead to more other-regarding behavior. An experiment in India on group lending[37] showed that increasing the social interactions among the program participants increased reliability and trust (Feigenberg, Field, and Pande 2010). Groups receiving loans were randomly assigned to meet either once a week or once a month. Compared to those who met monthly, individuals meeting weekly were three times less likely to default on subsequent loans. They were more willing, nearly two years after the experiment ended, to pool risk with their former group members. There was no change in the punishment meted out to those who misbehaved. The evidence suggests not that the greater contact strengthened the ability to enforce social norms, as in the example of social capital in section 2.3, but rather that greater contact elicited more altruistic behavior.[38]

5 Social determinants of perception and cognition

5.1 General theory

Man is a social being. He is social not just in what he does, but also in the lenses through which he perceives himself and the world. He does not, however, choose the lenses that he uses. They are socially acquired and socially activated.

Earlier, we argued that behavior is affected by what we have experienced—including the behavior of others whom we have *observed*. But in a fundamental sense, what we see is itself socially determined. Society affects our *perception* and *cognition*[39], what we see and how we process and interpret it. Not only does "society" *create* individuals, it even creates the *categories* that one uses to think about oneself and others. Because how others see us affects how we see ourselves, and because how individuals

---

[37] Where there is joint liability for repayment of the loan.

[38] There are many models of group lending as *social capital* (see e.g., Besley and Coate 1995), where it is individually rational for individuals to act cooperatively, as part of a repeated game. Feigenberg *et al.*'s results are more consistent with Haldar and Stiglitz' (2014) interpretation of the bankruptcy of SKS, the largest micro-finance bankruptcy ever. They argue that differences in repayment behavior as a result of differences in *social attitudes towards for-profit lenders and not for-profit lenders* were key. That is, individuals embedded in a situation where they are dealing with a for-profit firm behave differently, even when the financial pay-offs to the individual borrowers would be the same.

[39] By cognition, we mean, following DiMaggio (1997, p. 35), both reasoning and the pre-conscious bases of reasoning, including the sense of self, categorization, and default assumptions.

see themselves affects how they behave (the choices they make and, in a fundamental sense, *who* they are), social constructions—exemplified by categories like race and caste and gender into which individuals place others and themselves—can have important implications for social outcomes (Steele and Aronson 1995; DiMaggio, 1997; Hoff and Pandey 2006, 2014; Demeritt and Hoff 2015; Hoff and Walsh 2015).

Much of our thinking relies on pre-existing assumptions about the way the world works that the individual has not critically evaluated but rather has absorbed from his experiences and from society. "Most of uniquely human cognition is not genetically coded for, but rather has been invented, refined, and built up over historical time via the process of cultural transmission," writes the psychologist Michael Tomasello (1999). It is obvious that the language we use is socially constructed, and language affects how we process information and categorize objects. More broadly, the social contexts to which we have been exposed shape what we perceive and attend to.

An experiment in India illustrates this idea and points to its importance. In the experiment, subjects played a "stag hunt game." This is a coordination game in which each player simultaneously and independently makes a binary choice between "hunting hare" and "hunting stag." If a player hunts hare, his payoff is positive, but low, and is independent of what the other player(s) chooses. If, alternatively, a player hunts stag, his payoff is high if the other player(s) also hunts stag, but negative if not. This game allows cooperation in equilibrium (with all players hunting stag), but there is also the noncooperative and Pareto inefficient equilibrium (with all players hunting hare). The philosopher Brian Skyrms (2004, p. 9) writes that "the whole problem of adopting or modifying the social contract for mutual benefit can be seen as a stag hunt….[T]he state of nature [is] an equilibrium…[and there is] the problem of transcending it."

Based on experiments with US subjects (e.g., Van Huyck, Battalio, and Beil 1990), the ability of fixed pairs to form the efficient convention in the stag hunt was widely thought to be universal. But an experiment with men in north India showed that it is not universal. In the experiment, low-caste pairs were more than twice as successful as high-caste pairs in forming the efficient convention (in which they hunt stag) (Brooks, Hoff, and Pandey 2015). The high-caste men appeared to perceive an accidental coordination failure as an insult that they needed to punish. After a loss from a coordination failure, only 42% of high-caste players continued to choose to hunt stag in the next period, compared to 71% of low-caste players. This high-caste behavior in response to coordination

failure tended to block coordination on the efficient convention. In contrast, the low-caste men appeared to perceive accidents that caused them losses as the result of mistakes rather than malice. In a follow-up experiment with different subjects, this difference between high- and low-caste men occurred as well in responses to vignettes in which accidental circumstances led one person to cause a loss to another.

Because how we perceive the world affects what we do, it affects in a deep sense who we are. However, standard economics is built on the assumption that individuals are architects of their social worlds, but that the social worlds do not shape cognition or preferences—how individuals think or what they want. The core model in standard economics also assumes that individuals have unlimited powers of objective perception and reasoning. All individuals exposed to the same data and experiences would come to the same conclusions. The rational expectations model goes even further. It makes sufficiently stringent assumptions that, with enough dialogue, *all* individuals would come to hold the same beliefs—there would be common knowledge.[40]

In contrast, cultural psychologists and sociologists take it for granted that society is partly "inside us": socioeconomic factors affect the mental models that influence how we process information (e.g., Markus and Kitayama 2010). This section will present evidence (i) that the social environment shapes cognition and behavior; (ii) that this change cannot be explained only by changes in individuals' choice sets; and (iii) that the behaviors, in turn, shape the societal equilibrium. But first we present a simple model.

5.2 A simple model, with applications

A model helps illustrate the difference between the analysis here on the social determinants of *perception and cognition* and that in the previous section on the determinants of *preferences*. We now have to introduce the concept of *perception*, denoted **P**, where individuals' perceptions of their "real experiences" are socially determined, i.e., are affected by social stimuli, S. As before, we simplify and focus on one aspect of those experiences, the actions of others. What we actually see and how we interpret what we see (Was it aberration? How was it motivated? What does it tell us about the individual?) are all socially determined, but it is those perceptions (which may themselves be

---

[40] There is an important literature explaining why individuals may in fact "agree to disagree" (a survey is in Bonanno and Nehring 1997).

described by a vector of beliefs) that determine the individual's behavior. Thus, now we write the actions of all individuals, **a**, as

(5.1) $\mathbf{a}_t = H(p_t; \ \mathbf{P}(\mathbf{a}_{t-1}, S))$.

Focusing on the steady state, a social equilibrium is one in which

(5.2) $\mathbf{a}^* = H(\mathbf{p}^*, \mathbf{P}(\mathbf{a}^*, S))$

As before

(5.3) $Z(\mathbf{p}, \mathbf{a}) = 0$.

Obviously, the range of possible equilibria and the scope for policy interventions have increased enormously by taking into account that people respond to their perceptions rather than to the objective actions. If there is some way we can change perceptions, we can change behavior—and possibly the equilibrium—without doing much else.

Traditionally, we have had a hard time empirically distinguishing this model from the previous one, since we don't typically observe perceptions but only actions. But recent research (some of which is described below) has lent weight to this interpretation. Studies can, for instance, sometimes observe, or at least get evidence on, individuals' perceptions; and more recent research obtains evidence on brain activity. Individuals who perceive things differently may have different patterns of brain activity. Three examples illustrate and apply the ideas just presented.

5.2.1 Political reservations for women in India

In 1993, an amendment to the constitution of India reserved leadership positions for women in randomly selected villages in every Indian state. In the state of West Bengal, Beaman *et al.* (2009) measured how exposure to local women leaders affected villagers' implicit attitudes toward gender roles. To do this, they used an Implicit Association Test (IAT), which is widely viewed as a "test that tells us how culture works" (Shepherd 2011). The IAT examined occupational stereotypes for men and women. In particular, it examined the associations between male and female names, on the one hand and, on the other hand, concepts associated with gender-neutral *domestic* activities (for example, resting at home) and gender-neural *leadership* activities (for example, public speaking) (Beaman *et al.*, p. 1525).

For male respondents, though not for female respondents, exposure to local female leaders significantly reduced the association of domestic scenes with women, and of leadership activities with men. Just seven years' exposure to local women leaders also changed the villagers' *behavior*. It increased the number of women who chose to run for political office and the number of women who won elections. This means that the exogenous change in exposure to women village leaders changed behavior in ways that reproduced in some measure the initial change carried out under the constitutional amendment. The reservation policy might thus shift society to a new social equilibrium, where what has changed is not only behavior, but also mental models. The new mental models would then support the new societal equilibrium.

Beaman *et al.* (2012) measured the effect of the political reservations on parents' aspirations for their teenagers, and on teenagers' aspirations for themselves. Compared with villages that had not yet ever had political reservations for women, the gap between teenage girls and boys in aspirations fell by 25% among parents and by 32% among teenagers in those villages that had had political reservations for two election cycles. The changes in parents' aspirations appear to translate into changes in actions, e.g., in gender gap in the amount of time that teenagers have to spend on housework.

5.2.2 Women's livelihood project in India

A poverty alleviation project implemented by the government of the Indian state of Bihar and funded by the World Bank led to the enrollment of economically and socially disadvantaged women in savings groups (each group had 10 to 12 women) and to a series of social changes that brought about greater gender equality in a very poor and patriarchal region of India. A qualitative study (Sanyal, Rao, and Majumdar 2015) tracked two control and two treatment villages intensively over a three-year period – systematically comparing women's empowerment outcomes in both villages where women were actively participating, and in one where the project was never introduced. Over the course of eight years, the project gave women in treatment villages not only *exclusive* access to physical anf financial resources (such as cheap credit), but also new symbolic resources and a new institutional environment. The women were organized into a well-defined network called Self-Help Groups (or SHGs) within and across villages. Once a women's group had established a record of regular weekly savings, the group obtained access to loans at rates much lower than those available from village moneylenders. The groups met once a week, and the three elected officers of each of

the groups met bi-monthly at the village and district levels. A majority of the group members were entering domains and spheres of activity outside the home for the first time. The groups gave women an identity that cut across castes. The financial resources gave women greater bargaining power in the households, while the solidarity gave them greater political power. Their participation in civic, political, and financial institutions further broke down longstanding gender barriers, thereby "changing both men's and women's idea of what it means to be a woman." Women who went outside their homes and courtyards were no longer perceived as immoral for moving freely. They also were much more likely to run for ward and village-level elections. As one participant said, "You know, when a woman sees other women go out, she is willing to try it out herself...Now, I too have gone to other villages…" (p. 38).

5.2.3 Soap operas

Investigations of the effect of exposure to new kinds of fictional social environments in soap operas provide further evidence that exposure to (and emotional engagement with) new environments can change preferences and even perception and cognition. When people who have not been exposed to societies with low fertility were exposed to soap operas in which the adult characters had few or no children, fertility rates declined (Jensen and Oster 2009; La Ferrara, Chong, and Duryea 2012). There was a sizeable impact on fertility in Brazil of exposure to long-running serial dramas produced by a company that deliberately crafted soap operas with small families in order to bring about social change. The fertility decline across the municipalities in Brazil began after the first year that the municipality had access to the TV soap operas. The decline was especially great for respondents close in age to the leading female character in at least one of the soap operas aired in a given year, which is consistent with a role model effect. The decline was comparable to the effect of two additional years in women's education. For women ages 35–44, the decrease was 11 percent of mean fertility.[41]

When individuals in South Africa were randomly invited to watch a soap opera that featured a

---

[41] The causal impact is based on the arguably random timing that different parts of Brazil obtained access to the TV emissions. There was, however, no direct test available of a change in mental models.

character whose excessive borrowing and gambling led to his financial distress, viewers' understanding of financial management increased and they were less likely to engage in risky financial behavior themselves. Focus group findings suggest that viewers' emotional connections with the leading character helped to change the viewers' behavior. In Nigeria, soap operas are being designed to change behavior in ways that will slow the spread of HIV-AIDS; experimental evaluation is in progress (Banerjee, La Ferrara, and Orozco 2015).

The impact evaluations of the soap operas, like those of the political reservations and of the self-help groups for women, show that exposure to the new contexts has clearly shaped individuals. The idea that preferences are fixed can unambiguously be rejected.

Of course, a die-hard devotee of fixed preferences could argue: the soap opera has changed individuals' posterior distributions concerning the consequences of different behaviors; that is, beliefs about the net payoffs from different conduct have changed.

Alternative interpretations

But at least for some of the laboratory and natural experiments, this interpretation of what has happened is far-fetched. In the Indian example in Jensen and Oster, the situation observed in the soap opera is markedly different from that of the villages in which the viewers reside. How the middle-class urban husbands in the soap opera respond to the behavior of their wives is of little relevance to how the husbands of the village women (or even other women in the village) will respond. The soap opera conveys information not so much about how others respond to the woman, but about what the possibilities are of actions for the women. The soap opera conveys a sense of dignity and respect of the women for themselves. The soap opera is changing the women's own sense of identity. And in doing so, it is changing the women and their behavior.

Beyond short-term priming

These results can be related to priming, but in a distinctively different sense than that associated with fast thinking. Consider our earlier model of individuals with multiple identities: latent in these women was an identity with stronger self-regard. The soap opera primes that individual. But it primes it in a way with strong hysteresis effects: it is primed not just for the moment, but permanently, or at least durably. Of course, such changes are what we mean by endogeneity of preferences.

5.3 Language as a social construction

According to Berger and Luckmann (1966), our taken-for-granted understanding of everyday reality emerges from, and is sustained by, social processes. The concepts and categories we use reflect our socially imposed meanings, not any particular natural state of the world. Consider one obvious social construction, language. As the linguistic anthropologist Laura Ahearn (2012, p. 8) argues, a widely held but mistaken view of language is that it is "largely a set of labels that can be placed on pre-existing concepts, objects, or relationships." According to an alternative hypothesis, the Whorf hypothesis (Whorf 1954 [1941]), language *creates* categories and the categories influence cognition. "Which of the dramatically different sorts of things to which languages require their speakers to pay attention have been found to have an influence on thought" (Ahearn, p. 83). The semantic domain of color gives well-studied examples. The Russian language has distinct and commonly used words for light blues, *goluboy,* and dark blues, *siniy.* Winawer *et al.* (2007) find that this gives native Russian speakers an advantage over native English speakers in discriminating between colors at the *goluboy/siniy* boundary (e.g. one *goluboy* and one *siniy*). Native Russian speakers are no faster at distinguishing colors that are not at this boundary. Participants in an experiment performed a task of color differentiation that did not involve language and was too brief to give them the time to access the color terms in their language, yet nonetheless language mattered. The results suggest that language in the color domain affects the perception of colors.[42]

5.4 Race and caste as social constructions

While language is an obvious social construction, many social identities, such as race and caste, are also social constructions. In societies in which race is not viewed as a salient characteristic, it may in fact not be. But race may affect behavior when people come to see individuals through the lens of race. When this happens, a category like race that would contain no relevant information in a situation in which race is not viewed as a salient category becomes relevant and may carry meanings.[43]

---

[42] Language embeds culturally the needs of society to respond to these physical circumstances, so, for instance, Crusoe and Friday would have developed words to communicate subtle differences in weather. And once the language is developed, it would reinforce how we see the environment.

[43] Hoff and Stiglitz (2010) construct simple models showing that this is the case. See also Appendix C.

Thus, there are some social constructions that can be totally artificial; *ex post* they reinforce the interests of one group or another. Because they are artificial constructions, they can be changed. Later sections will illustrate interventions that have changed social constructions.

5.4.1. Multiple equilibria and self-fulfilling social constructions

Socially constructed fictions can thus be self-fulfilling. If individuals believe that they are relevant, they become relevant. In an experiment in India, when high- and low- caste boys played a game in which they received rewards for every maze they solved, there was no performance difference between high- and low-castes until caste identity was primed (Hoff and Pandey, 2006, 2014). When caste was made salient in mixed-caste settings, a performance gap of almost a quarter emerged between the high- and low-caste boys in favor of the high castes. (The mazes were solved on paper packets that were assessed anonymously. Thus a caste bias by the grader could not have influenced the measure of performance.)

5.5 Social multipliers and the interdependence of beliefs

There is good reason that our perceptions are affected by those of others. We each have only limited information and limited information-processing capabilities. Few of us have the ability to evaluate the scientific evidence on global warming. In effect, we delegate that responsibility to others. We *trust* that they will honestly do that task--or at least most of us do so.[44][45]

Appendix B provides a simple model in which there is belief interdependence.[46] The important consequence is that there can be a multiplier effect on beliefs--a change in information that leads to

---

[44] The scientific community does not rely just on trust, but on verification (which might be thought of as the opposite of trust). Norms requiring the disclosure of data and methodology enable verification. Still, most people have to rely that others have performed the requisite verification.

[45] We have thus far used trust in a broad sense. In the "multiple identities" model that we have employed in earlier sections of this paper, different identities can trust in different things. Some may be more faith-based: "In God we trust." Others may correspond to the "enlightenment identity," trusting in the Scientific Process. Which identity becomes the individual can be socially determined. There is a subgroup in the US population that has come *not* to trust in the scientific process and to doubt the validity of climate science. Most individuals do not have the ability to verify whether or not the claims of the scientific community (say as reflected in the IPCC reports) are accurate. They rely on others, and their beliefs are subject to confirmatory bias. When they hear evidence that one small aspect of a study is flawed, they may see that as evidence that the entire study is flawed. As we note below, those beliefs are then reinforced. There is a culture of "climate-change deniers."

[46] Belief interdependence also arises in models of common knowledge, in which beliefs converge. Here, beliefs do not in general converge.

a change in one individual's beliefs is amplified as others in society change their beliefs. Any individual may not know why others have changed their beliefs; he simply takes their change in beliefs as new data to be processed, which reinforces the initial change in beliefs.

Behavior of each can change in response to the change in beliefs, and the observed consequences of those changes in behavior are again new data, which typically will be reinforcing. Thus, political leaders often talk about confidence multipliers: if we can only create a mood of confidence, there will be more investment, which will justify and amplify the increase in confidence.[47]

The model of Appendix B describes the contagion of beliefs about a very particular subject, the probability of the occurrence of an event. But the same process is at play in the contagion of values and even preferences.

What makes this particularly relevant are intertemporal linkages. For instance, if being primed for other-regarding behavior at time t makes it easier to be primed for such behavior at later dates (or results in the individual's making choices that make it more likely that he will be primed for such behavior), then those from one society will appear to be different (that is, in a given context, they will make different choices) from those from other societies.

5.6 Information processing, social reinforcement, and social divisions

The assumption in the previous section that we do not *choose* our culture, and that our culture shapes us, is perhaps too extreme. We do not choose the society into which we are born, but we might be able to choose the subgroups with which we associate. Like the media to which we are exposed, our subgroups play a role in shaping our beliefs, values, and perceptions (Haidt et al. 1993).

But even then, the structure of society (which the individual does not choose) affects the extent to which different subgroups come into contact with each other and, when they do, the extent to which people in one group give credibility to the beliefs of those in other groups.[48] If we believe that others' circumstances and interests are distinctly different from, or opposed to, ours, then we

---

[47] But, of course, beliefs are eventually tested against reality, even if filtered through distorted lens with confirmatory bias; even when there is a social multiplier, the green shoots of spring 2009 that had withered by the summer almost surely eroded confidence in the economic officials who had touted them as signs of an incipient robust recovery. See Akerlof and Shiller (2009).

[48] See, e.g., Gentzkow and Shapiro (2011). Fricker (2007) coins the term "epistemic injustice" for the discounting of the credibility of an individual by virtue of his membership in a race or other group whose membership is fixed by his ascriptive characteristics.

are less likely to give the others credibility, so that any exchange of beliefs is less likely to give rise to convergence in beliefs. Societies that are more divided (in income, ethnicity, etc.) are more likely to end up with divisions in beliefs (and less trust in each other), making cooperative behavior more difficult; and indeed, making interactions less frequent, partly because the interactions may prove less pleasurable.

Whether we give weight to the beliefs of particular individuals and groups is at least partly culturally determined--affected by the beliefs of the groups with which we identify and whose beliefs we trust.

As we have noted, cultural and political outlooks affect how individuals interpret data. One of the most strongly established psychological biases is *confirmatory bias*. Earlier studies of confirmatory bias simply tested the extent to which prior beliefs affect the interpretation of data. Where those prior beliefs came from was not of concern. Here, we simply note that to a large extent, those prior beliefs are culturally determined. Different cultures then come to believe different things—and they believe that the evidence supports their beliefs. As Hoff and Stiglitz (2010) emphasize, there can be, as a result, equilibrium fictions: *different* beliefs among different groups can be sustained, even though the groups are confronted repeatedly by evidence that would undermine the differences if the individuals were rational, autonomous actors (Appendix C).

In an experiment by Kahan et al. (2013), individuals were presented with identical data in two different contexts and then were asked which hypothesis the data supported. One context was ideologically and politically neutral: the hypothesis concerned which of two skin creams was more effective. The second context was ideologically and politically charged: the hypothesis concerned whether gun control reduced crime. Respondents were randomly assigned to one of the two contexts. In pre-play tests, the study assessed the numeracy of the respondents, as well as their cultural and ideological outlooks. As might be expected, in the case of the skin cream frame, the greater the respondent's numeracy, the greater the probability he interpreted the data correctly. The probability was not affected by his cultural and political outlooks. In contrast, in the case of the gun control frame, a respondent was more likely to interpret the data correctly when the correct interpretation corresponded to his ideology and political views. Moreover, when the correct answer in the gun control framing supported his ideological beliefs, numeracy helped (boosting the odds of getting the answer right). But when the correct answer was inconsistent with the respondent's ideology, numeracy had little impact. The results support a very general finding that on topics that

are important for social and political identity, individuals tend to engage in *motivated reasoning*—the tendency to arrive at conclusions they like, no matter what their level of numeracy.[49]

5.7 Role model effects: The demand for educating daughters and social equilibrium

As emphasized throughout this paper, how individuals see the world depends on the lenses through which they view it; and they do not, in general, choose the lenses.[50,51]   For instance, comments of women in interviews in India provide suggestive evidence of the influence of prevailing patterns in society on attitudes towards educating girls. When asked why their daughters never went to school, some parents said that "girls don't go to school in our community." When parents in Kerala, a socially progressive state in India, were asked why they sent their children to school, some didn't know what to say because they took it as self-evident that going to school was what children do (*PROBE, 1999*).

This section presents a simple model that illustrates the idea that associated with different social patterns in society are different ways of seeing the world. The model is a special case of the model of perceptions in equations (5.1)-(5.3).

There is a continuum of agents, whom we call parents. Each pair of parents has a young daughter. Parents have to choose whether or not to educate her. From an uneducated daughter, the parents would get a fixed utility θ that varies across households according to the cumulative distribution function $F(\theta)$.[52]

The focus of the model is the determination of the preference for educating a daughter. The parents do not have a unitary "true" utility function. How they think about educating their daughter depends on the society in which they live. Besides the market-determined lifetime earnings of the

---

[49] The main results were replicated in an experiment with randomly selected World Bank staff (World Bank Group 2015) as well as other development professionals (Gauri *et al.*, 2015). Motivated reasoning is an interpretation of confirmatory bias. It is important to realize that individuals may not be conscious of this bias. The persistence of beliefs in the face of mounting evidence to the contrary provides part of the rationale for rejecting the hypothesis that the individuals are just engaged in Bayesian updating. Bayesian statisticians with different priors would of course come up with different posterior views of the world. But as evidence mounts, there should be a convergence of beliefs among individuals with different priors.

[50] This is true, even though, through effort, some individuals can alter their own lenses. Our analysis applies so long as most people, most of the time, see the world through lenses that are socially acquired and socially activated. Our results apply even though most people imagine that they see the world in an unmediated, veridical way (Fiske and Taylor, 2013, p. 105).

[51] See Douglas (1986), D'Andrade (1995), and DiMaggio (1997).

[52] In general, this would depend on economic and social variables, but we abstract from that for simplicity. Thus there is a fixed distribution of preferences for an uneducated daughter.

daughter, W, the parents' attitudes come from prevailing social patterns. Consider two mental models, A and P. Under A, which holds a woman's autonomy in esteem, an educated daughter is a source of pride to her parents. Under P, which reflects attitudes of a patriarchal society, an educated daughter is a threat to the social order and to men's masculinity. Parents' utility from an educated daughter depends on the salience of each of the two mental models. Let U be a weighted sum,

$$U = \omega(s)V^A + [1-\omega(s)]V^P + W$$

where s is the salience of the mental model A and V^A is the parents' intrinsic valuation of an educated daughters under mental model A, and similarly for V^P. Reflecting the discussion above on Indian villagers' attitudes towards educating girls, let s be the fraction of the population in the community that educates their daughters. The weight ω **and** thus U are increasing in s. If all households educate daughters, $\omega = 1$, and if none do, $\omega = 0$.

For given s, at an interior equilibrium the marginal uneducated girl will give her parents utility $\hat{\theta}$:

$$\hat{\theta} = \omega(s)V^A + [1-\omega(s)]V^P + W.$$

The evolution of the fraction of educated girls closes the model. We focus on the long run. A long-run interior equilibrium is a fraction of daughters that are educated, s^*, that solves

$$\hat{\theta} = \omega(s^*)V^A + [1-\omega(s^*)]V^P + W,$$

and

$$s^* = F(\hat{\theta})$$

since only if $\theta < \hat{\theta}$ do parents choose to educate their daughter.
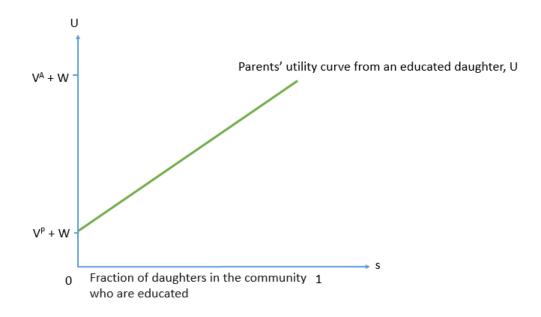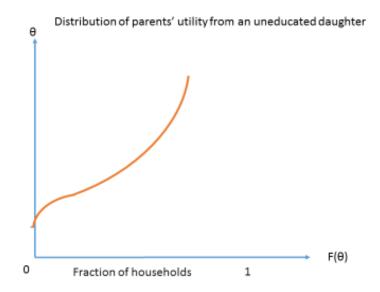
The top panel of figure 3 shows how the utility from educating a daughter increases in the fraction of daughters in the community who are educated. It slopes up because it is socially determined by the fraction of girls who are educated, which increases the weight ω. (The slope is $\omega'(s)[V^A-V^P]$.)
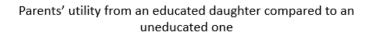
The second panel shows the distribution of utilities in the households from an uneducated daughter. This value varies over the population of parents by assumption (e.g., some parents have greater need than others for a young child to work at home to tend to an infant or sick grandmother). The figure assumes a roughly normal distribution of θ.

The bottom panel superimposes the two graphs. There are two stable equilibria (the solid circles) and one unstable equilibrium between them. In the "bad" equilibrium, the environment has no educated girls and the patriarchal mental model is so salient that no parents want to educate their daughters. In the "good" equilibrium, a high fraction of daughters is educated, which makes mental model A salient, which increases the parents' preferences for educating a daughter. This leads most households to educate their daughters.

Figure 3. Role model effects on preferences for an educated daughter

Distribution of parents' utility from an uneducated daughter

θ

0   Fraction of households   1   F(θ)

Parents' utility from an educated daughter compared to an uneducated one

Utility

$V^A + W$

θ

U

Good equilibrium

Bad equilibrium

$V^P + W$

0   Fraction of educated daughters; fraction of households   1   F(θ), s

A testable prediction of the model is that an exogenous increase in women's job opportunities – an increase in expected lifetime earnings from W to W' — can lead to a large increase in the fraction of daughters who are educated. Figure 4 illustrates this. In the figure, there are initially two stable equilibria—the bad equilibrium with no daughters educated, and the good equilibrium with nearly all daughters educated. An increase in W shifts up the parents' utility curve (U) of having an educated daughter. As the number of daughters who are educated increases, parents' preferences change. The rightward movement along the U-curve is so large that the new, unique equilibrium entails nearly universal education of girls.
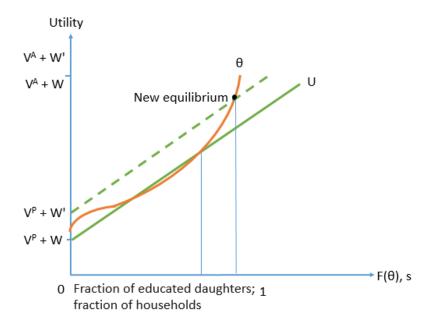
Figure 4. The effect of a shift in the labor demand for educating girls

The prediction of a large shift in behavior as a result of a small shift in expected lifetime earnings to an educated daughter was borne out in a field experiment in India (Jensen 2012). Jensen sent call center recruiters to a randomly selected set of villages that had never been served by job center recruiters. The recruiters helped young women in the villages obtain call center jobs. In the treatment villages compared to the control villagers, there was a 4.6 percentage point increase in the probability that a young woman would obtain a call center job. Although the expected wealth effect was very small, it substantially changed how households treated daughters. Compared to girls in the

control villages, girls in the treatment villages were more likely to be enrolled in school. For young girls, 30-40% of the gap in body mass index with wealthy Delhi residents was closed three years after the experiment. Jensen argues that the changes in parents' behavior are too large to be plausibly explained within a model in which parents have fixed preferences. Instead, a plausible interpretation, depicted in figure 4, is that the shift up in job opportunities and hence in W increased the salience of the mental model in which educated daughters were intrinsically valued rather than stigmatized. The increase in the weight on mental model A rather than P strongly enhanced the effect of the increased job opportunities on parents' investments in their daughters.

Figure 5 shows the striking contrast between the model with endogenous preferences and a model with fixed preferences. With fixed preferences, the increase in an educated girl's expected earnings, W, brings about only a small increase in the fraction of parents who choose to educate their daughter.

The shift depicted in figure 4, with endogenous preferences, illustrates a phenomenon described by DiMaggio (1997) in this way: "large-scale cultural changes may be caused by large-scale, more or less simultaneous frame switches by many interdependent actors" (p. 280).

Figure 5. Autonomous preferences for an educated daughter

5.7.1 Other examples of role model effects

Other studies also find evidence that exposure to new social patterns changes individual preferences. In Pakistan, the government uses a lottery to allocate visas to applicants who seek to participate in the Hajj. At the Hajj, Muslims from over 100 countries gather in Mecca, communally performing rituals. Utilizing the random choice of Pakistani lottery winners, Clingingsmith, Khwaja, and Kremer (2009) show that, for both male and female Pakistanis, participation in the Hajj changed attitudes. Despite the fact that pilgrims' social roles did not change upon their return home, the experience led to greater acceptance of female education and female employment, a more positive view of women's abilities, and greater concern about crimes against women in Pakistan. The effects were larger for those travelling in smaller groups, as predicted by the theory that the effects depend on relative exposure to new role models.

Even exposure to fiction, such as serial drama, can change perception, preferences, and behavior, as we noted in section 5.2.3.

5.8 Ecology, society, and individual behavior

Race and caste are categories into which we put different individuals, and these categories are socially determined. A large literature in psychology investigates how *ecological conditions,* giving rise to the growing of particular crops entailing particular degrees of communal cooperation, affect behavior and thinking, e.g., whether individuals think holistically (focusing on context) or analytically (focusing on the features of individual objects in isolation). Obviously, individuals who think in ways that are markedly different, and who observe the world very differently, will behave differently, taking different actions when exposed to the same choice set.

The Yangtze River in China divides areas that have traditionally farmed mostly rice from areas that have farmed mostly wheat. The same dynasties have ruled over the rice and wheat regions for most of the past few thousands of years, but the ecology and social patterns have been very different in the two regions. Rice farmers have to cooperate intensively: to build irrigation systems, coordinate the use of water, and cooperate in dredging and draining the system. Since transplanting and harvesting rice needs to be done in a short window of time, rice farmers tend to form cooperative labor exchange and coordinate their planting dates to allow them to help out in each other's fields. In contrast, wheat does not need to be irrigated, and planting and harvesting wheat impose a much
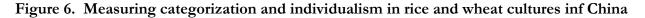
lighter labor burden, so that most wheat farmers can look after their own plots without relying on their neighbors.
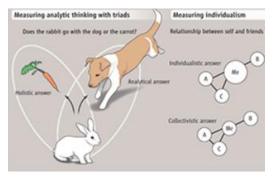
It is natural to hypothesize that the resulting large differences in social organization would in turn lead to large differences in the mental models that individuals use. The next two subsections confirm that that is the case.

5.8.1 Mental models

To test the hypothesis of a causal link from ecology to psychology and to assess the role of mental models, Talhelm *et al.* (2014) conducted psychological tests on Han Chinese students in universities spread across China. The students were shown lists of three items and asked to choose which two items should be paired (the test is called a *triad test*; see Ji, Zhang, and Nisbett 2004) Examples of triads were {train, bus, track} and {dog, rabbit, carrots}; see figure 6, left panel. In each triad, two of the items belong to the same abstract category, such as vehicle or animal, and two share a functional relationship: trains run on tracks, and rabbits eat carrots. The researchers found that the subjects in rice culture were more likely to categorize pairs with reference to the interactions between elements of the triad, whereas the subjects in wheat culture were more likely to categorize pairs with reference to abstract principles applying to the individual items of the triad. The same results hold when samples were limited to border areas of the Yangtze River, which implies that the results cannot be explained by omitted variables.

The results continued to hold when instead of agriculture grown, an instrumental variable of ecological conditions was used to predict the production levels of rice and wheat in a region. This removes concerns that a more holistic psychology might cause more rice-growing, or that a third variable might cause both holism and rice-growing.

Figure 6. Measuring categorization and individualism in rice and wheat cultures inf China

Source: Henrich 2014.

5.8.2 Individualism

We have emphasized the social determinants of cognition. The study in China also assessed how the perceived importance of the self relative to that of one's close associates depended on the social conditions, driven, as we have suggested, by differences in ecology. The assessment used the *sociogram task*, in which participants draw a diagram of their social network using circles to represent the self and others. A measure of individualism is how large participants draw the self compared to how large they draw the others. Earlier esearch found that Americans draw themselves about 6 mm bigger than they draw others, Europeans draw themselves 3.5 mm bigger, and Japanese draw themselves slightly smaller than others (Kitayama et al. 2009). The finding in the China study was that people from the rice culture drew the circle of themselves slightly smaller (-0.20 mm) than of their close associates (that is, they deflated the self relative to others), while people from wheat provinces self-inflated by 1.5mm (Talhelm et al. 2014). See figure 6, right panel.

Other studies have confirmed these differences in cognition. East Asians, in general, are more holistic and interdependent in their thinking than Westerners (a literature review is Nisbett and Masuda 2003). Experimental subjects were asked to explain outcomes in sports and the movement of animate and inanimate objects. The East Asians were more likely to explain the events with reference to interactions between the object and the field— external, contextual, and historical factors. The Americans, in contrast, were more likely to explain the same events by reference to presumed traits, abilities, and other characteristics of the individual.

Not surprisingly, there are behavioral consequences to these differences in cognition. Both the study comparing the rice and wheat cultures of China, and a cross-country study (Lester 1995), find that individualistic cultures have higher divorce rates (controlling for GDP per capita). In China, the wheat provinces had a 50% higher divorce rate than the rice provinces in 1996. Despite the near doubling of the divorce rate in China in the past 15 years, the raw divorce rate gap between the wheat and rice provinces remained the same in 2000 and 2010.

5.9 Brain activity
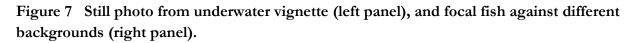
So far, we have identified fundamental differences in cognition between the rice and wheat cultures of China and also shown differences in behavior that might be explained by the differences in cognition. Such differences are also reflected in observed brain activity: there are neurological differences between East Asians and Westerners. For instance, a universal human feature is to
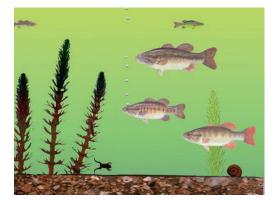
engage a particular part of the brain (the medial prefrontal cortex, or mPFC) while thinking about the self (see references in Kitayama and Park, 2010, p. 115). But the Chinese, in contrast to Westerners, also engage the mPFC when they think about others in their social network. Among Chinese, the mPFC is strongly engaged when one's mother is thought about.
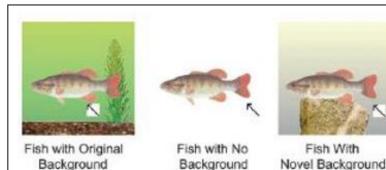
5.9.1 Attention and perception

Until recently, it was believed that the basic mechanisms of perceptual processing were innate.[53] Even this has now been proven wrong. The social environment shapes the way individuals decode their visual environment, guiding attention, perception, and memory (Nisbett et al. 2001). Asians attend more to the field of view, and Westerners attend more to salient objects within the field. An experiment presented 20-second videos of underwater scenes to Japanese and American participants (Masuda and Nisbett 2001). Figure 7 shows a still photo from one of the videos. After seeing ten videos, participants were presented with still photos of objects they had seen before and also objects they had not seen before. The previously seen objects were shown in one of three ways: (i) against the original background, (ii) against no background, or (iii) against a novel background, as shown in the right panel of the figure. The Japanese participants were thrown off by presentation of the object against the novel field. They made substantially more errors when the object was seen against a novel background than when it was seen against the original background. In contrast, the background manipulation did not affect the performance of the American participants.

Figure 7   Still photo from underwater vignette (left panel), and focal fish against different backgrounds (right panel).

Source. Masuda and Nisbett 2001.

---

[53] Locke (1689) uses the metaphor "white paper void of all characters" to describe the mind.

5.9.2 Culture, behavior, and the brain

From what we have said so far, it is clear that culture has physiological consequences. There are physical, including neurological, bases underlying the differences described above. Chua, Boland, and Nisbett (2005) examined the eye movements of US and East Asian participants looking at images with a focal object imposed on a complex background. Compared to the East Asians, the US participants focused on, and looked more quickly at, the focal objects in their visual arena. The East Asians made more quick glances to the background.

The observed physiological differences, too, can be linked to brain activity. In a study using functional magnetic resonance imaging (fMRI), the neural processes that underpin these differences were identified. Compared to East Asian participants, US participants activated more regions in the brain implicated in object processing (Gutchess et al. 2006).

5.9.3 The endogeneity of the brain

Thus, the metaphorical distinction often made between hardware (the brain) and software (culture) may be less rigid than the standard vocabulary suggests. The brain itself and the way it operates can be altered by experience. That this is so has long been suspected, but advances in neuroscience are confirming this. Consider cab-driving in London. It requires continuously retrieving episodic memories of a busy complex city, simulating possible routes, and operating on maps. The drivers make constant use of the navigating functions of their hippocampi (Maguire et al. 2006). As a result, the shape of their hippocampi systematically differs from the shape in non-cab drivers. The longer the cab drivers have been driving, the larger the differences are. The act of driving, self-motion from riding in a car, or preexisting individual differences at the time of career choice cannot explain the differences in the hippocampi.

The example of cab drivers sheds light on human malleability more generally. The routines and habits that people engage in are not randomly distributed across the world. Instead, they emerge from historical experience and are organized by social factors. Just as taxi drivers regularly perform certain tasks (retrieving relevant episodic memories, simulating possible routes, and operating on the mental maps), so too do people in different cultures. Sustained engagement in tasks yields culturally

patterned neural activities (Kitayama and Park 2010, p 114); the mind can become "re-tooled" (Wilson 2010).

5.9.4 Implications for standard economics

The findings that culture and experience affect categorization, individualism, attention, perception, and cognition have an immediate economic implication: the standard assumption in economics of intertemporal separability is misleading. What happens at one date affects behavior and perceptions at later dates. Experiences affect cognition. Experiences that the subjects have had in their lives affect the accuracy with which their brains respond even to very simple tasks, for example, estimating the absolute compared to the relative lengths of lines in the *framed-line test* (Kitayama et al. 2003). As the psychologist Steven Heine (2012, p. 9) writes, "mind and culture cannot be disentangled; the mind is shaped by its experiences, and cultures differ in the kinds of experiences that they provide." Culture (experience) affects how experiences are experienced.

6 Social dynamics and rigidities

6.1 Societal rigidities

One implication of the social determinants of preferences and cognition, with each individual's beliefs and behavior dependent on those of others, is that societal rigidities can emerge. Confirmatory bias and the dependence of behavior on perceptions can contribute further to societal rigidities.

For example, the caste system need not be enforced by punishment in a repeated game (as in Abreu 1988) or not only by such mechanisms. Individuals in all positions may come to believe that there is something fundamentally "right" about the system. If outcomes of failure by those who deviate from their assigned roles are more salient than successes (as a result of confirmatory bias), individuals will come to believe that it is best for them to act in accordance with the norm. Moreover, if, as Hoff and Pandey (2006, 2014) and Hoff, Kshetramade, and Fehr (2011) show, behavior itself is affected by these beliefs (echoing in part the beliefs of others), then the behavior can be self-confirming. Each individual may believe that it is optimal for him or her to play the role assigned by the system, and there can be broad consensus in society that the social order is appropriate.

In older times (and even today in some quarters), these belief systems were reinforced by ideology (Hoff and Stiglitz 2010). The ideology may be that the social order is ordained by God or that it is efficient, with differences in well-being reflecting differences in societal contributions. There is always uncertainty about social change, and with enough uncertainty—belief about which can be socially engendered by elites who would be the likely losers from a change—and enough risk aversion, the change in the social order may actually seem undesirable. It might seem that changes to that order would impose huge costs that would not be justified by the expected benefits.

While it is easy for those in the West to look at the caste system as an example of societal rigidity, there are examples in the West as well. Consider the overwhelming evidence on climate change. A large subgroup of the US population (a recent estimate is 35%) has created a belief system that there is not solid evidence that the Earth is warming.[54] Change to halt global warming requires collective action. Given the opposition of this group, the action that is required is not (so far) forthcoming. Given the strength of their prior beliefs, additional evidence seems to have little bearing on the climate change skeptics' beliefs.[55]

Another source of societal rigidity can be a low level of trust. Appendix A shows that an economy can be characterized by multiple equilibria with respect to trust and trustworthiness, arising from differences in socially determined preferences and beliefs and not, as in section 2.3, from differences in social capital, i.e., payoffs in the context of a repeated game. In the trust equilibrium in the appendix, the lack of trust can fundamentally *change* the individual. The identity that is elicited (or primed) in the no-trust equilibrium is different from the one that is primed in the trust equilibrium. While the "trustworthy" individual that is primed in his direct interactions with others could be justified as part of a rational Bayesian equilibrium (it is optimal for him to act in a trustworthy way in interactions with other trustworthy individuals, but to act in a selfish and opportunistic way if he believes he is interacting with non-trustworthy people), his trustworthy mode of interaction carries over into other interactions. He behaves, more generally, in a trustworthy way.

In principle, in models of trust based on repeated games, it is possible to engineer a shift from a no-trust equilibrium to a trust equilibrium. There is no lingering effect on "fundamentals" of the

---

[54]Pew Research Center (2014), section 7.

[55] It is increasingly difficult for the climate change deniers to hold onto their position. Even then, evidence that climate is changing does not answer the question of the cause, the extent to which it is the result of human behavior. But one doesn't have to answer that question to frame a policy response: reductions in carbon emissions could still be the best way of preventing the untoward events that would otherwise occur.

episode in which the economy seemed stuck in a no-trust equilibrium. In contrast, in models of trust based on priming identity, once the no-trust identity is primed, it may be difficult to put the genie back into the bottle. Personalities are shaped. Behavior patterns get entrenched and are passed on across generations. History matters.[56] For instance, the lack of trust that characterized the Soviet Union has had long-term effects on the functioning of society in the post-Soviet era.[57]

6.2 Social change

There are, of course, important historical instances in which nonetheless, large societal changes in the level of trust occurred: There was little trust between workers and management in Japan in the 1920s, but this seemed to have changed in the post-World War II era. Understanding how one moves from one social equilibrium to another (in this case from a low-trust equilibrium to another)—in spite of the forces for societal rigidity that we have described—is one of the important areas of ongoing research. Here, we describe some aspects of that process.

6.2.1 A simple mathematical model

Consider a slight variant of the model introduced earlier with perception, denoted by $\mathbf{P}$:

(6.1) $\mathbf{a_t} = H(p_t; \ \mathbb{P} \ (\mathbf{a}_{t-1}, S, \varepsilon_t) \ ) + u_t$.

There are idiosyncratic shocks to perceptions, denoted, ε_t , and to behavior, denoted u_t. In such a world, even with symmetrically identical (similar) individuals, different individuals will take different (but similar) actions. We can assess social stability (rigidity) by looking at some aggregate measure, such as the average value of $\mathbf{a}$, denoted $\bar{\mathbf{a}}$. If the population is large, then in the long run $\bar{\mathbf{a}}$ changes little if the variances of $\varepsilon_t + u_t$ are small. If the variance of $\bar{\mathbf{a}}$ is small, then we can say that the system exhibits societal stability (rigidity).

We noted earlier that there can be multiple equilibria. With large enough disturbances, the system can move from one equilibrium to another. Each can have a domain of attraction.

---

[56] See Nunn, 2008, Durante 2010, Algan and Cahuc 2010, and Nunn and Wantchekon 2011.
[57] Of course, even in the simplest economic models, there can be strong intertemporal linkages. In the models presented earlier in this paper, prior experiences (consumption) affect current preferences. Interlinkages are absent only with strong assumptions of intertemporal separability. So too, there can be intertemporal linkages arising from beliefs that adapt slowly. As long as the memory of, say, banks' bad behavior remains, there will be a lack of trust. In our model in Appendix A, a lack of trust induces the agents to behave in an untrustworthy way, reinforcing pre-existing beliefs.

Policy can induce a change in equilibrium in two ways. First, certain actions may be forbidden. The individual, in maximizing his utility subject to his budget constraints, may be constrained from certain actions (e.g. discriminating against African-Americans). That may change his actions and those of others and move society to a different social equilibrium. Note that once the society has moved to the new equilibrium, it may be stable: there may be no need for continued enforcement actions (Stiglitz 1973, 1974).

The second way that policy can change the equilibrium is by exposing individuals to new situations and role models, e.g., through soap operas, that change their perceptions. Again, a self-sustaining new equilibrium can be established. (These ideas were explored in the *World Development Report 2015*.)

6.3 The internal logic of beliefs

Beliefs can have a dynamic of their own. Changes in ideologies can lead to a change in perceptions and beliefs. Once the doctrine that "all men are created equal" came to be accepted as part of the American ideology, there was a logic (resisted, admittedly by many) that extended these notions of equality to African-Americans and women. That logic could, and did, come into conflict with interests. There were some individuals for whom the logic was trumped by self-interest; others for whom it was not. But the willingness of some to sacrifice self-interest, as normally understood, for principles and the well-being of others is testimony to the limitations of economists' standard model.[58]

7. Normative considerations and policy

Importing psychological, sociological, and anthropological insights into economists' conception of preferences and cognition provides additional tools for changing behavior— beyond the economists' usual toolkit. At the same time, the analysis provides cautions about how difficult it is to anticipate behavioral effects of policies when those policies change societal perceptions and norms. Thus, the change in primary school enrollment of girls in Uganda after the elimination of school fees was far greater than predicted by standard econometric models because it appears to have induced a change in norms: for parents not to take advantage of the free education offered to

---

[58] Of course, Adam Smith in *The Theory of Moral Sentiments* took a much broader view of human motivation and human nature than that taken by those who claim to be his modern-day descendants.

their daughters came to be viewed as *wrong,* whereas before, parents were perceived to make reasonable choices in economizing scarce family resources.

Our analysis also provides insights into political battles about framing. For example, is inequality the result of impersonal competitive market forces or of political choices and economic rent-seeking? Is it efficient or not, exploitative or not? The political battles, even when the challengers to the system fail to achieve their political goals, can have societal consequences because they may change the perceptions of large subgroups of the population.

"Culture"—which following DiMaggio (1997) are the mental models learned from society and cued by the context and on which people draw to conceptualize — has effects like public goods or bads. Externalities are pervasive. Sandel (2011) has noted that converting certain transactions into market transactions[59] encourages the expression of the selfish self and corrupts the social relationship. The conversion denigrates the value of the transaction. Because the values associated with certain actions are socially determined, there are consequences even for individuals who have not converted the transactions of the given type into market transactions.

Our well-being depends not just on the goods we consume, but is deeply affected by our relationship with others. Take the issue of trust. Trust is a social phenomenon. Economists have begun to recognize its implications for standard economics: Economic performance in a low-trust equilibrium is lower, in general, than in a high-trust equilibrium (Algan and Cahuc 2010). But there is a difference between living in a high- and a low-trust society that is more fundamental than the gap in the efficiency of production and exchange. Trust influences not only our behavior but also have a direct effect on our well-being. Holding the goods and services provided in a transaction constant, interactions without trust give rise to anxiety and a loss of well-being, at least for many (if not most) individuals.[60]

Because of these pervasive externalities, there is no presumption that the equilibria that arise in the models we have explored have any optimality properties. Hoff and Stiglitz (2010) explore one

---

[59] This is illustrated by the example of the Israeli child-care center described earlier.
[60] This is just another example where well-being is not captured by GDP. See Stiglitz, Sen, and Fitoussi, 2010.

example— the use of racial or caste constructs, which clearly did not serve the interests of large segments of society.[61]

While the contribution of this work to positive economics should be clear, it poses difficult, well-known normative questions. Standard welfare economics evaluates alternative economic policies assuming individuals with well-specified utility functions. When utility functions can change as a result of policy, which utility function should be used? (Similar problems arise even in conventional settings: when individuals maximize expected utility, where the subjective probabilities of different events can change, it is as if the utility function changes. Do we use the *ex ante* utility function--say based on very incomplete information--or the *ex post* one?)

The models force us to ask, what do we mean by a good society? Assume, for instance, that there were a social evolution that led to an equilibrium in which our selfish self, rather than our other-regarding self, was the only one that manifested itself. Could we be non-judgmental about the desirability of such an equilibrium in comparison with one that was more balanced? In posing the question this way, we are going beyond the instrumental view of economic policy.

8. Conclusion

The taxonomy of social determinants of preferences and cognition that we have discussed provides explanations and predictions that are different from both those provided by conventional economics and much of the work in behavioral economics, with its focus on individuals in isolation and with its insights derived primarily from cognitive psychology. People are social animals. It should not be surprising that the social environment affects preferences and cognition and, thus, not only choice sets but also how people make choices. While it is obvious that many aspects of life (the many manifestations of altruism, love, civic-mindedness, spite, etc.) are not well explained by economic models despite valiant attempts to do so,[62] we hope that we have persuaded the reader that important aspects of economic behavior can best be understood through models in which an individual's interactions with others are at the core of the theory explaining not only choice sets but

---

[61]They suggest that the use of race as an important categorization is historically relatively recent; there were societal equilibria in US history in which such categories were not used.

[62] Much of the work in what is sometimes thought of as "economic imperialism" shows that price effects matter even when there are non-economic motivations. Establishing this may still leave unexplained much of the variability in behavior.

how the individual makes choices. Moreover, behavior is affected not just by the social context *at the moment of decision-making.* There is a deeper sense in which social context affects preferences and cognition.

We have emphasized, in particular, how culture—social context—shapes how the individual perceives the world, the lens through which he sees it, the categories that he uses to understand and interpret it. This can give rise to multiple equilibria and societal rigidities.

Societies can get trapped into dysfunctional norms and behavior patterns. It is possible to change norms and to prime identities and mental models that change behavior. The *World Development Report* 2015 provides dramatic examples. They include many to which we have referred here: using lockable boxes with savings books in order to increase individuals' ability to act on their intentions to save for preventative health products; exposing individuals to soap operas with female characters with small families, which reduced birth rates; and using political reservations to expose villagers to local women leaders—thereby eliminating or reducing gender bias in evaluations of leaders and in parents' aspirations for teenage children.

We have shown that there is a wealth of evidence for behavioral changes—both natural and laboratory experiments—that is hard to reconcile within the standard economics model (the rational actor model with fixed preferences), but which is consistent with our models of endogenous preferences and socially determined cognition.

Conventional economics provides a lens through which one can see the world, including human interactions. It stresses the importance of financial incentives and largely denies the relevance of altruism for understanding markets. By assuming that preferences are fixed, it assumes that policy interventions (including providing financial incentives) will not alter the nature of the individual, his identity, and his perception of others. Of course, well-trained economists do not deny the existence of these other effects, but suggest that they are the province of other social sciences.[63] This view of the world is itself a social construct—one that serves some interests but may have had adverse

---

[63] The anthropologist Clifford Geertz (1973, p. 44) calls this the "stratigraphic approach." Our conclusion accords with his hypothesis that "we need to replace the 'stratigraphic' conception of the relations between the various aspects of human existence with a synthetic one; that is, one in which biological, psychological, sociological, and cultural factors can be treated as variables within unitary systems of analysis."

effects on others and on society as a whole. This worldview helps frame how we think about economic decisions and about society more broadly.

One central insight of behavioral economics is that framing matters. It affects individual behavior, collective decision-making, and the evolution of beliefs and culture. The standard economics framing of individuals and the determinants of their behavior has had profound effects on economic and social policy and the evolution of many societies.

Ideologies are often contested. In the last few years, the framing provided by conventional economics has become increasingly contested and the subject of debate. This paper can be viewed as a contribution to that debate. It is about the proper balance between social and non-social determinants of behavior (endowments, technology, and incentives).

The ability of so many to ignore the social determinants of behavior, in spite of the wealth of evidence for them, is testimony to the importance of two of the concepts presented here—mental models and confirmatory bias. The irrational devotion to the model of rationality provides further cause for skepticism about rationality. As this paper and the rich literature upon which it draws argue, there are alternative models of human behavior, with markedly different implications for how economic systems function. Economic research on the social determinants of preferences, cognition and, thus, behavior is still young. The rapidly growing body of work suggests the fruitfulness of more realistic models of human behavior for explaining outcomes and designing policies.

Appendix A The effect of trust on trustworthiness

This appendix shows that it is easy to construct a model in which there is an equilibrium exhibiting a high level of trust, and another equilibrium with a low level of trust. Three hypotheses underlie the analysis:

(i)   When individual i interacts with individual j, whether i trusts j affects how i behaves.

(ii)   What i does may elicit either trustworthy or untrustworthy behavior. Thus j's behavior is (in part) a consequence of i's behavior, which in turn depends on i's beliefs.

(iii) Beliefs are, at least in part, social constructions. If others believe that, in general, people are trustworthy, individual i will believe that, too; if others believe that most people are untrustworthy, so will individual i. The collective experience is greater than the individual experience. That's why the collective wisdom is given such weight.

In the model presented here (a variant of Hoff and Stiglitz 2004), individuals have a choice: they can take the trustworthy action (dealing honestly with one's trading partner), or the untrustworthy action (dealing dishonestly). One randomly meets trading partners, has no knowledge of their trustworthiness, but has beliefs based on a given set of societal beliefs of the fraction of trustworthy people, x (or more accurately, the fraction of people who will *act* in a trustworthy way). One also has knowledge of one's previous experience. For simplicity, we assume a one-period memory, and so the expected value of x is given by $x^e = B(x^s, \Lambda)$, where x^s are societal beliefs about the fraction of people who acted in a trustworthy way in the previous period. Λ is an indicator function that takes the value 1 if the individual's previous encounter is with a trustworthy person, and 0 otherwise. The individual has to take an action before he knows whether his partner is trustworthy, but finds out later whether he is or is not.

Individuals differ in their utility functions, e.g. in the disutility from acting in an untrustworthy way. Some may actually get utility from such behavior, but it causes disutility to "good" individuals. There is a distribution of types, θ, denoted by $F(\theta)$. A type θ individual chooses to act in a trustworthy way or not depending on his beliefs about the likelihood that his trading partner will act in a trustworthy way. Thus, for any given x^e, there is a critical value of θ

(A.1) $\theta(x^e) \equiv \hat{\theta}$

such that for $\theta \geq \hat{\theta}$, the individual acts in a trustworthy way. Given societal beliefs and the individual's last period experience, the fraction of people who will act in a trustworthy way this period is determined.

We need to close the model with an equation describing the evolution of societal beliefs. We focus on a limiting case in which individuals give no weight to their own experience. Then a long-run rational expectations social equilibrium is the solution to (A.1) and

(A.2) $1 - F(\hat{\theta}) = x^* = x^e$

There can, in general, exist multiple equilibria, i.e. multiple values of $\{x, \hat{\theta}\}$ satisfying (A.1) and (A.2). A low equilibrium value of θ means that most people in society act in a trustworthy way—it is a *trust society*—while a high value means society is untrusting. When there are such multiple equilibria, a large shock--undermining even temporarily the level of trust--can move the society from a trust society to one in which trust in other people is low.

This analysis assumed that individual preferences were given (individuals differed in a single parameter, θ, the utility of behaving honestly). It focused on how socially determined *beliefs* affected actions, and therefore beliefs, within a standard model. This is an example of what the financier George Soros refers to as *reflexivity,* the idea that beliefs can change the economic fundamentals.

The social context can, itself, change individual preferences—how they behave and the choices they make. Many individuals have within themselves a selfish and a non-selfish person, a trustworthy and a non-trustworthy person. An environment in which there is no trust brings out the non-trustworthy identity. The non-trustworthy environment, in effect, lowers the utility of acting in a trustworthy way. For example, the close supervision of actions that an employer interacting with a worker takes in a low-trust environment may elicit behavior in which the worker takes advantage of any lapse of attention by the supervisor. The distribution function of $\theta\hat{}$ is itself a function of the social environment. Thus, the fraction of people who act honestly, in (A.2), becomes

(A.3) $1 - F(\hat{\theta}, x^*) = x^*.$

It should be apparent that it is even easier to generate multiple equilibria in the fraction of trustworthy people, x^*, in the society.

Appendix B   Social interdependence of beliefs

What we believe depends on what others believe. As a result, a change in beliefs by one person can be amplified throughout a social network. To be concrete, assume for individual i that his beliefs, p^i, about the probability of the occurrence of an event are a function of his information and others' beliefs:

(B.1) $p^i = f^i (p^{-i}, I^i)$

The equilibrium set of beliefs is given by p^{i*} satisfying the simultaneous equations for all i:

(B.2) $p^{i*} = f^i (p^{-i*}, I^i)$.

It should be evident that the vector of all individuals' beliefs is

(B.3) $\mathbf{p}^* = \Psi (\mathbf{I})$.

The equilibrium beliefs are a function of the aggregate information.

Consider an economy with two individuals. Only individual 1 has access to outside information, but he doesn't know this. When he revises his beliefs as a result of new information, individual 2 will also revise his beliefs. Individual 1 (mistakenly) thinks there is information content in individual 2's change in beliefs, so he revises his beliefs in response to the change in individual 2's beliefs. Using functional notation without superscripts, we have

(B.4a) $p^1 = f(p^2, I^1)$

(B.4b) $p^2 = g(p^1)$.

Substituting (B.4b) into (B.4a), we obtain

(B.5) $p^1 = f(g(p^1), I^1)$,

so that

(B.6) $dp^1/dI^1 = [\partial f/\partial I^1] \dfrac{1}{1 - \left[\frac{\partial f}{\partial p2}\right]\left[\frac{dg}{dp1}\right]}$

The right-hand side is the product of two factors: the partial derivative with respect to information (the direct effect) and the social multiplier, which is the extent to which a new piece of information is amplified within the network. (Herding behavior can, of course, appear even in models with rational expectations.)

Appendix C   An equilibrium fiction of racial hierarchy in cognitive ability

This appendix shows how a belief in race and in a racial gap in intelligence can *produce* a racial gap in cognitive performance. It draws on three features of how the mind works: we think in terms of categories given to us by society, we have confirmatory bias, and confidence improves our performance. (See Hoff and Stiglitz 2010 and the evidence in Smith et al. 2008 and Mobius et al. 2013.)

Assume that individuals undertake a series of projects, at each of which they can fail or succeed. Confidence, based on the person's perception of his frequency of success, affects the probability of success in future attempts. The top panel of figure C-1 shows the relationship. If the individual's perceptions of his successes and failures were unbiased, there would be a unique equilibrium at the point marked E, where the 45 degree line intersects the probability-of-success curve. At point E, the perceived success probability is equal to the actual success probability.

However, this is not an equilibrium if an individual manages his self-image by "forgetting," or rationalizing as uninformative of future success, a given fraction of his failures. Frequencies of success are random variables. But in the long run, a true frequency of success will translate into a perceived frequency of success whose distribution is concentrated around a single value (Compte and Postlewaite 2004). The relationship between the true and the perceived mean frequency of success is a bowed-out curve. (It corresponds to the truth if there are only failures or only successes—hence the bowed-out shape from the 45 degree line.) The larger the fraction of failures that are forgotten, the more the curve is bowed out.

Consider two types of people and call them Solid and Dashed. They have the same ability, but process information differently: Solids are better able than Dashed to forget their own failures. The

middle panel graphs the self-confidence curve of Solid as the more bowed-out curve than that of Dashed.

The bottom panel superimposes the probability of success curve on the self-confidence curves. The difference between Solid and Dashed in the way they process information generates a different level of -confidence and hence of performance for each group—S for Solids and D for Dashed.

Now reinterpret the model by introducing a social element—race. Suppose that the Solid and Dashed types are exactly the same, except there is a social construct that defines two "races," Solid and Dashed. The races are salient—a Solid sees himself as Solid, a Dashed as Dashed. The Dashed are defined as the inferior race, which affects how they process information about themselves. Compared to a Solid, a Dashed cannot as easily forget or explain away his failures because he sees them as confirming his alleged inferiority.
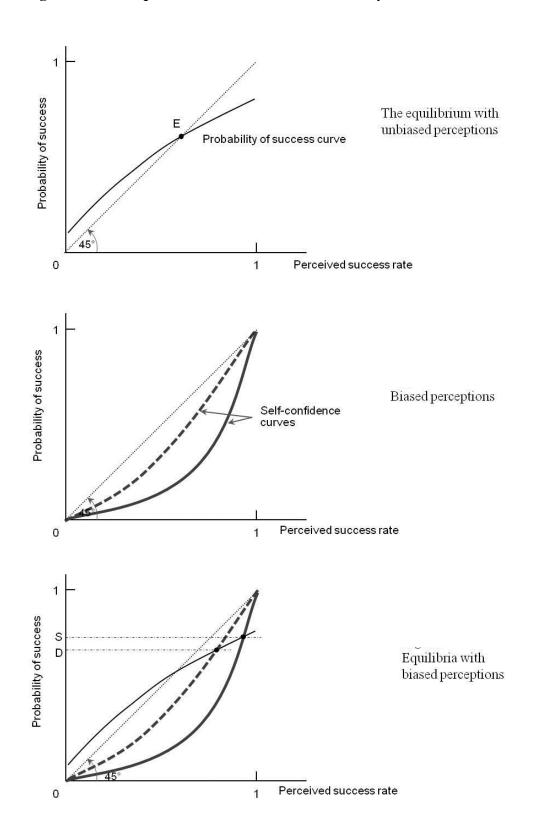
Figure C-1. An equilibrium fiction of racial hierarchy

References

Abreu, D., 1988. On the theory of infinitely repeated games with discounting. Econometrica 56(2), 383–396.

Acharya, A., Blackwell, M., Sen, M. 2015. The political legacy of American slavery. HKS Working Paper No. RWP14-057

Ahearn, L. M., 2012. Living language: An Introduction to Linguistic Anthropology. West Sussex: John Wiley Blackwell.

Akerlof, G. A., Shiller, R. J., 2009. Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism. Princeton: Princeton University Press.

Akerlof, G.A., 1989. The economics of illusion. Economics and Politics 1(1), 1-15.

Alesina, A., Giuliano, P. 2015. Culture and institutions. Journal of Economic Literature 53(4), 898-944.

Alesina, A., Giuliano, P., and Nunn, N.. 2013. On the origins of gender roles: Women and the plough. Quarterly Journal of Economics 128 (2), 469–530

Algan, Y., Cahuc, P., 2010. Inherited trust and growth. The American Economic Review 100(5), 2060-2092.

Ariely, D., 2008. Predictably Irrational: The Hidden Forces that Shape our Decisions. New York: HarperCollins.

Ariely, D., Loewenstein, G., & Prelec, D. 2003. Coherent Arbitrariness: Stable demand curves without stable preferences. The Quarterly Journal of Economics 118(1), 73-106.

Arrow, K. J. 1963 [1951], Social Choice and Individual Values. New Haven: Yale University Press.

Arrow, K. J. 1969. The organization of economic activity: Issues pertinent to the choice of market versus nonmarket allocation. In: The analysis and evaluation of public expenditure: The PPB system, Joint Economic Committee, 1, 59-73

Arrow, K. J. 1994. Methodological individualism and social knowledge. The American Economic Review, 1-9.

Arrow, K., Dasgupta, P. S., 2009. Conspicuous consumption, inconspicuous leisure, conspicuous consumption, inconspicuous leisure. The Economic Journal 119(541), F423–F546.

Ashraf, N., Bandiera, O., Jack, B. K. 2014. No margin, no mission? A field experiment on incentives for public service delivery. Journal of Public Economics 120, 1-17.

Baldassarri, D., Grossman, G., 2013. The effect of group attachment and social position on prosocial behavior: Evidence from lab-in-the-field experiments. PLoS ONE 8 (3), 1–9.

Banerjee, A., La Ferrara, E., and Orozco, V. 2015. Changing norms and behavior of young people in Nigeria: An evaluation of entertainment TV, mimeo, Bocconi University.

Beaman, L., Chattopadhyay, R., Duflo, E., Pande, R., Topalova, P. 2009. Powerful women: Does exposure reduce bias? Quaterly Journal of Economics 124(4), 1497-1540.

Beaman, L., Duflo, E., Pande, R., Topalova, P. 2012. Female leadership raises aspirations and educational attainment for girls: A policy experiment in India. Science 335 (6068), 582–86.

Becker, G. S., 1957. The Economics of Discrimination. Chicago: University of Chicago Press.

Bénabou, R., Tirole, J., 2002. Self- confidence and personal motivation. The Quarterly Journal of Economics 117(3), 817-951

Berger, P. L., Luckmann, T., 1966. The Social Construction of Reality: A Treatise in the Sociology of Knowledge. New York: Anchor Books.

Besley, T., Coate, S., 1995. Group lending, repayment incentives and social collateral. Journal of Development Economics 46(1), 1-18.

Bowles, S., Polania-Reyes, S., 2012. Economic incentives and social Preferences: Substitutes or complements? Journal of Economic Literature 50(2), 368–425.

Bregman, E. O., 1934. An attempt to modify the emotional attitudes of infants by the conditioned response technique. The Pedagogical Seminary and Journal of Genetic Psychology, 45(1), 169-198.

Bonanno, G. and Nehring, K. 1997. "Agreeing to disagree: A survey." Manuscript, University of California-David.

Brooks, B., Hoff, K., Pandey, P. 2015. Culture and the formation of (in)efficient conventions: Experimental evidence from India, mimeo, University of Chicago.

Chua, H. F., Boland, J. E., & Nisbett, R. E. (2005). Cultural variation in eye movements during scene perception. *Proceedings of the National Academy of Sciences of the United States of America*, *102*(35), 12629-12633.

Cialdini, R. B., Demaine, L.J., Sagarin, B.J., Barrett, D.W., Rhoads, K., Winer, P.L. 2006. Managing social norms for persuasive impact. Social influence 1(1), 3-15.

Clingingsmith, D. Khwaja, A., Kremer, M. 2009. Estimating the impact of the Hajj: Religion and tolerance in Islam's global gathering. The Quarterly Journal of Economics 124 (3), 1133-1170.

Cohen, D., Nisbett, R. E., Bowdle, B., Schwarz, N. 1996. Insult, aggression, and the southern culture of honor: An "experimental ethnography". Journal of Personality and Social Psychology 70(5), 945-960.

Cohn, A., Fehr E., Maréchal, M.A. 2014. Business culture and dishonesty in the banking industry. Nature. 516, 86-89.

Compte, O., Postlewaite, A., 2004. Confidence-enhanced performance. American Economics Review 94(5), 1536-1557.

D'Andrade, R.G., 1995. The development of cognitive anthropology. Cambridge: Cambridge University Press.

Dasgupta, N., 2011. Ingroup experts and peers as social vaccines who inoculate the self-concept: The stereotype inoculation model. Psychological Inquiry, 22, 231-246.

Dasgupta, P., Serageldin, I., 2000. Social Capital: A Multifaceted Perspective. Washington: World Bank.

DellaVigna, S., 2007. Psychology and economics: Evidence from the field. Journal of Economic Literature.

Demeritt, A., Hoff, K., 2015. "Small Miracles": Behavioral insights to improve development policy. In: Basu, K., Stiglitz, J. E. (Eds.). Contemporary Issues in Development Economics. London: Palgrave MacMillan, 19-43.

Denzau, A. T., North, D. C., 1994. Shared mental models: ideologies and institutions. Kyklos 47(1), 3-31.

DiMaggio, P., 1997. Culture and cognition. Annual Review of Sociology 23, 263-287.

Douglas, M., 1986. How Institutions Think. Syracuse: Syracuse University Press.

Duesenberry, J. S., 1949. Income, Saving and the Theory of Consumer Behavior. Cambridge: Harvard University Press.

Dupas, P., Robinson, J., 2013. Why don't the poor save more? Evidence from health savings experiments. American Economic Review 103 (4), 1138–71.

Durante, R., 2010. Risk, cooperation and the economic origins of social trust: An empirical investigation. Working paper, Sciences Po, Paris.

Executive Office of the President, National Science and Technology Council, 2015. Social and Behavioral Sciences Team Annual Report, Washington DC.

Feigenberg, B., Field, E., Pande, R. 2010. Building social capital through microfinance. National Bureau of Economic Research, Working paper No. w16018.

Fiske, A. P., Kitayama, S., Markus, H. R., Nisbett, R. E. 1998. The cultural matrix of social psychology. In: Gilbert, D. T., Fiske, S., Lindzey, G.. The Handbook of Social Psychology 4th ed vol II. Oxford: Oxford University Press.

Fiske, S. T., Taylor, S. E., 2013. Social Cognition: From Brains to Culture, 2nd edition. Washington: Sage.

Fisman, R., Kariv, S., Markovits, D.. 2009. Exposure to ideology and distributional preferences. Unpublished paper.

Fricker, M., 2007. Epistemic injustice: Power and the ethics of knowing. Oxford: Oxford University Press.

Gauri, V., Banuri, S., Dercon, S. 2015. The biases of development professionals. Manuscript. World Bank.

Geertz, C., 1973. The interpretation of cultures: Selected essays. New York: Basic Books.

Gentzkow, M., Shapiro, J. M., 2011. Ideological segregation online and offline. The Quarterly Journal of Economics 126(4), 1799-1839.

Gneezy, U., Rustichini, A., 2000. A fine is a price. Journal of Legal Studies 29 (2000), 1-18.

Gneezy, U., Meier, S., Rey-Biel, P. When and why incentives (don't) work to modify behavior. Journal of Economic Perspectives 25(4), 191–210.

Gutchess, A. H., Welsh, R. C., Boduroĝlu, A., Park, D. C. 2006. Cultural differences in neural function associated with object processing. Cognitive, Affective, and Behavioral Neuroscience *6*(2), 102-109.

Haidt, J., Koller, S. H., Dias, M. G. 1993. Affect, culture, and morality, or is it wrong to eat your dog? Journal of personality and social psychology *65*(4), 613.

Haldar, A., Stiglitz, J. E., 2014. The Indian microfinance crisis: The role of social capital, the shift to for-profit lending and implications for microfinance theory and practice. Mimeo. Columbia University.

Heine, S. J., 2010. Cultural Psychology. In: Fiske, S. T., Gilbert, D. T., Lindzey, G. (Eds.). Handbook of Social Psychology. New York: Wiley, 1423-64.

Heine, S. J. 2012. Cultural Psychology. New York: W.W.Norton and Company.

Herbst, D., Mas, A., 2015. Peer effects on worker output in the laboratory generalize to the field. Science 350(6260), 545-549.

Herlihy, D., Cohn, S. K., 1997. The Black Death and the New Transformation of the West. Cambridge*:* Harvard University Press.

Hoff, K., Kshetramade, M., Fehr, E. 2011. Caste and punishment: The legacy of caste culture in norm enforcement. The Economic Journal 121(556), F449-F475.

Hoff, K., Pandey, P. 2006. Discrimination, social identity, and durable inequalities. American Economic Review, Papers and Proceedings 96(2), 206-211.

Hoff, K., Pandey, P. 2014. Making up people: The effect of identity on performance in a modernizing society. Journal of Development Economics 106, 118-131.

Hoff, K., Stiglitz, J. E. 2001. Modern economic theory and development. In: Meier, G., Stiglitz, J. E. (Eds.). Frontiers of Development Economics: The Future in Perspective. Oxford: Oxford University Press, 389-459.

Hoff, K., Stiglitz, J. E. 2004. After the big bang? Obstacles to the emergence of the rule of law in post-communist societies. American Economic Review 94(3), 753-763.

Hoff, K., Stiglitz, J. E. 2010. Equilibrium fictions: A cognitive approach to societal rigidity. American Economic Review 100(2), 141-146.

Hoff, K., Walsh, J. 2015. Putting behavioral development economics to work: Tackling social exclusion. Mimeo. The World Bank.

Iyer, L., Mani, A., Mishra, P., Topalova, P. 2012. The power of political voice: Women's political representation and crime in India. American Economic Journal: Applied Economics 4(4), 165-193.

Jensen, R., 2012. Do labor market opportunities affect young women's work and family decisions? Experimental evidence from India. Quarterly Journal of Economics 127(2), 753-792.

Jensen, R., Oster, E. 2009. The power of TV: Cable television and women's status in India. Quarterly Journal of Economics 124(3), 1057-1094.

Kahan, D. M., Peters, E., Dawson, E. C., Slovic, P., 2013. Motivated Numeracy and Enlightened Self-Government. Yale Law School, Public Law Working Paper No. 307.

Kahneman, D., 2003. A perspective on judgment and choice: mapping bounded rationality. American psychologist 58(9), 697.

Kahneman, D., 2011. Thinking, Fast and Slow, Farrar, Straus and Giroux, ISBN 978-0374275631. (Reviewed by Freeman Dyson in New York Review of Books, pp. 40–44.

Kinzler, K.D., Spelke, E.S., 2011. Do infants show social preferences for people differing in race? Cognition, 119(1), 1-9.

Kityama, S., Duffy, S., Kawamura, T, Larsen, J. 2003. Perceiving an object and its context in different cultures: A cultural look at new look. Psychological Science 14, 201-206

Kitayama, S., Park, H., Timur Sevincer, A., Karasawa, M., Uskul, A. K, 2009. A cultural task analysis of implicit independence: comparing North America, Western Europe, and East Asia. Journal of personality and social psychology 97(2), 236-255

Kitayama, S., Park, J., 2010. Cultural neuroscience of the self: understanding the social grounding of the brain. Social cognitive and affective neuroscience 5(2-3), 111-129.

Kraft-Todd, G., Yoeli, E., Bhanot, S., & Rand, D., 2015. Promoting cooperation in the field. Current Opinion in Behavioral Sciences 3, 96-101.

Kremer, M., Levy, D., 2008. Peer effects and alcohol use among college students. The Journal of Economic Perspectives 22(3), 189-189.

La Ferrara, E., Chong, Duryea, S., 2012. Soap operas and fertility: Evidence from Brazil. American Economic Journal: Applied Economics *4*(4), 1-31.

Lester, D., 1995. Individualism and divorce. Psychological Reports 76(1), 258-258.

Li-Jun J., Zhang, Z., Nisbett, R. E., 2004. Is it culture or is it language? Examination of language effects in cross-cultural research on categorization. Journal of personality and social psychology *87*(1), 57-65.

Locke, J. (1955 [1689]). Essay concerning human understanding. Amherst, NY: Prometheus Books.

Maguire, E. A., Woollett, K., & Spiers, H. J., 2006. London taxi drivers and bus drivers: a structural MRI and neuropsychological analysis. Hippocampus 16(12), 1091-1101.

Markus, H. and Kitayama, S. 2010. Cultures and selves: A cycle of mutual constitution. Perspectives on Psychological Science 5(4), 420-430.

Masuda, T., Nisbett, R. E., 2001. Attending holistically versus analytically: comparing the context sensitivity of Japanese and Americans. Journal of Personality and Social Psychology 81(5), 922-934.

Mobius, M. M., Niederle, M., Niehaus, P., & Rosenblat, T., 2014. Managing self-confidence: Theory and experimental evidence. Mimeo. Harvard University.

Moscovici, S., 1985. Social influence and conformity. In: Lindzey, G., Aronson, E., (Eds.). The Handbook of Social Psychology*,* 3rd ed., Vol. 2, New York: Random House, 347-412

Nisbett, R. E., Masuda, T., 2003. Culture and point of view. Proceedings of the National Academy of Sciences 100(19), 11163-11170.

Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A., 2001. Culture and systems of thought: holistic versus analytic cognition. Psychological Review 108(2), 291-310.

North, D. C., 1990. Institutions, Institutional Change and Economic Performance. Cambridge: Cambridge University Press.

Nunn, N., 2008. The Long-term effects of Africa's slave trades. Quarterly Journal of Economics 123 (1), 139–76.

Nunn, N., Wantchekon, L., 2011. The slave trade and the origins of mistrust in Africa. American Economic Review 101 (7), 3221–52.

Ostrom, E., 1990. Governing the commons: The evolution of institutions for collective action. Cambridge: Cambridge University Press.

PROBE Team, 1999. Public Report on Basic Education in India. New Delhi: Oxford University Press.

Putnam, R. D., 1993. Making Democracy Work: Civic Traditions in Modern Italy. Princeton: Princeton University Press.

Putnam, R. D., 2000. Bowling Alone: The Collapse and Revival of American Community. New York: Simon and Schuster.

Rabin, M., 1998. Psychology and economics. Journal of Economic Literature 36(1), 11-46.

Sandel, M. J., 2012. What Money Can't Buy: The Moral Limits of Markets. New York: Farrar, Straus and Giroux.

Sanyal, P. , Rao, V., Majumdar, S. 2015. Recasting culture to undo gender: A sociological analysis of Jeevika in Rural Bihar, India. World Bank Policy Research Working Paper 7411.

Schelling, T. C. 1984. Self-command in practice, in policy, and in a theory of rational choice. The American Economic Review 74(2), 1-11.

Schutz, A., 2013 [1953]. The Frame of Unquestioned Constructs. In: Douglas, M. (Ed.). Rules and Meanings: The Anthropology of Everyday Knowledge. New York: Routledge.

Shepherd, H., 2011. The Cultural Context of Cognition: What the Implicit Association Test Tells Us About How Culture Works. Sociological Forum 26(1), 121-143.

Skyrms, B. 2004. The Stag Hunt and the Evolution of Social Structure. Cambridge, UK: Cambridge University Press.

Smith, A., 2009[1759]. The Theory of Moral Sentiments. Reprinted 2009

Smith, P., Jostmann, N. B., Galinksy, A. D., van Dijk, W. W., 2008. Lacking Power Impairs Executive Functions. Psychological Science 19(5), 441-447

Steele, C. M., Aronson, J., 1995. Stereotype threat and the intellectual test performance of African Americans. Journal of Personality and Social Psychology 69 (5), 797–811.

Stiglitz, J. E., 1973. Approaches to the Economics of Discrimination. American Economic Review 62(2), 287-295.

Stiglitz, J. E., 1974. Theories of discrimination and economic policy. In: von Furstenberg, G., Harrison, B., Horowitz, A.R. (Eds.). Patterns of Racial Discrimination, D.C. Heath and Company. Washington: Lexington Books, 5-26.

Stiglitz, J. E., 2001. Democratic development as the fruits of labor. In: Chang, J.H., (Ed.). London: Wimbledon Publishing Company, 279-315.

Stiglitz, J. E. Sen, A., & Fitoussi. J. P., 2009. The Measurement of Economic Performance and Social Progress Revisited. *Reflections and Overview*. Paris: Commission on the Measurement of Economic Performance and Social Progress.

Stiglitz. J. E., 2008. Toward a general theory of consumerism: Reflections on Keynes' economic possibilities for our grandchildren. In: Piga, G., Pecchi, L. (Eds.). Revisiting Keynes: Economic Possibilities for Our Grandchildren. Cambridge: MIT Press, 41-85.

Swidler, A., 2001. Talk of Love: How Culture Matters. Chicago: University of Chicago Press.

Talhelm, T., Zhang, X., Oishi, S., Shimin, C., Duan, D., Lan, X., Kitayama, S., 2014. Large-scale psychological differences within China explained by rice versus wheat agriculture. Science 344 (6184), 603–08.

Thaler, R. H., Sunstein, C. R., 2008. Nudge: Improving Decisions about Health, Wealth, and Happiness. New Haven: Yale University Press.

Tomasello, M., 1999. The Cultural Origins of Human Cognition. Cambridge: Harvard University Press.

Tversky, A., Kahneman, D., 1974. Judgment under uncertainty: Heuristics and biases. Science 185(4157), 1124-1131.

Van Huyck, J. B., Battalio, R.C., Beil, R.O. 1990. Tacit coordination games, strategic uncertainty, and coordination failure. The American Economic Review, 80(1), 234-248.

Veblen, T. 2007[1899]. The Theory of the Leisure Class: An Economic Study of Institutions. New York: , Mead, N. L. The Macmillan Company.

Vohs, K. D., Mead, N. L., Goode, M. R. 2006. The psychological consequences of money. Science 314(5802), 1154-56.

Whorf, B.L., 1956[1941]. The relation of habitual thought and behavior to language. In: Carroll, J.B (ed.). Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf. Cambridge: MIT Press.

Wilson, M. 2010. The re-tooled mind: How culture re-engineers cognition. Social Cognitive and Affective Neuroscience 5(2-3), 180–187.

Winawer, J., Witthoft, N., Frank, M. C., Wu, L., Wade, A. R., Boroditsky, L.. 2007. Russian blues reveal effects of language on color discrimination. Proceedings of the National Academy of Sciences 104(19), 7780-85.

World Bank Group. 2015. World Development Report 2015: Mind, Society, and Behavior, Washington DC.

Zerubavel, E., 1997. Social Mindscapes: An Invitation to Cognitive Sociology. Cambridge: Harvard University Press.