

Equilibrium Fictions:

A Cognitive Approach to Institutions, with an Application to Race

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Abstract. What is the role of ideology in economic change? As a social scientist, one can see historical patterns that are repeated over and over again and that are virtually impossible to explain within a rational expectations model. This paper combines experimental work in psychology and behavioral economics and the economic analysis of behavior with an historical analysis to recast in economic terms arguments about the *cognitive* basis of institutions. Institutions provide not only the rules of the game, but also a set of categories that shape perceptions, and a logic by which to make new decisions. We apply this perspective to racial ideologies and, more generally, to institutions and institutional change.

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At least since the publication of Gunnar Myrdal's *Asian Drama*, it has been recognized that development economics would be greatly enriched by bringing in the notion of what we today call *cognitive frames*—"largely unconscious perceptual screens that determine how one views or understands a situation" (Elkins and Simeon 1979). Myrdal argued that people in poor countries could be trapped by their attitudes toward life and work, such as the assignment of shame to certain forms of manual work and the "psychological limitations on policies seeking to equalize opportunities" (Myrdal 1956, cited in Meier, 1976, p. 689-90). Myrdal argued, in effect, that certain social constructs affect behavior and were part of what we might call a dysfunctional economic equilibrium that could persist. But he did not address the question of the mechanisms by which such social constructs are created, evolve, or collapse. Nor did he ask, How do we reconcile such constructions of the developmental process with the usual approaches taken by economists? *This paper attempts to sketch a general approach to societal evolution that clarifies the critical—and unrealistic—assumptions about individual behavior and cognition that underlie what has become the dominant developmental model within the economics literature.* In so doing, we provide some insights into why Myrdal's predictions concerning Asia's prospects could have been so much off the mark.

To illustrate the general theory, and to see how this theory contrasts with more conventional approaches, we focus on the issue of race—categories into which individuals put themselves and others, which have had, and continue to have, large impacts on social interactions and economic behavior. We ask, How can an inefficient equilibrium, with high inequality between different groups, emerge and persist if the groups do not differ in any economically relevant characteristic? This provides a concrete context in which we can show how a more accurate

representation of individuals' shared "mental models" can help explain institutional persistence and change and economic development.¹

Older theories of discrimination in the conventional economics literature based on rational expectations are theories of statistical discrimination. They do not take into account that the categories taken as given in statistical discrimination models are products of history, and that the process of constructing these categories, as we will show through examples, shapes their content, which in turn shapes behavior. Taking these factors into account provides a new approach to explaining the persistence of dysfunctional inequality. We will present a model that is a particular example of the general psychological insights about confirmatory bias and the impact on behavior of social identity.²

But what we are really interested in is a theory of social organization, *i.e.*, of institutions. We will use the term "social construct" to mean anything that is a collective man-made good. The words might suggest a constructing enterprise. However, we do not mean that any such enterprise exists; collective beliefs can emerge endogenously from individual behaviors. Both institutions and collective beliefs ("ideologies") are social constructs. The persistence of an institution depends on the persistence of the beliefs of individuals—beliefs both about how others behave *and* about the legitimacy of the institution; *i.e.* about what is acceptable. *We are concerned with what collective beliefs are an equilibrium, and how they change.*

¹ *E.g.*, from North (2005): "The way we perceive the world and construct our explanations about the world requires that we delve into how the mind and brain work..." Meier (2005) discusses alternative treatments of institutions, culture, and development.

² Economists (typically outside the "mainstream") have, of course, been grappling with the problem of beliefs that an individual constructs. For example, efficiency wage models show how perceptions of fairness (an individual construct) can affect morale, morale can affect behavior (Stiglitz, Akerlof), and this can explain the persistence of dysfunctional inequality. Benabou and Tirole (2002) construct a theory of the strategic construction of beliefs about oneself. Benabou (2008) constructs a theory of the strategic construction of beliefs about the role of markets versus governments.

Economists have well-defined theories of the evolution of other state variables that describe an economic system, such as human and physical capital stocks. Collective beliefs change too, but we do not have a well-formulated theory of how they change. Classical game theory provides a description of when a set of beliefs can be self-confirming because it is consistent with outcomes. Such beliefs constitute a rational expectations (RE) equilibrium. Within the standard statistical approaches, Bayesian theory provides a well-formulated theory within which we can assess, in some highly idealized models, whether multiple RE equilibria exist and which ones are stable.³ In general, there are very few possible equilibria, and each is sensitive to any change in parameters. Equilibria depends only on the current economic variables. History does not matter (except in variants of the model in which there are multiple equilibria, in which case history may determine which of the equilibria the economy chooses). Thus this model cannot explain the rigidities that Myrdal described.

Recently, discussions of macroeconomics have taken another approach—they have assigned a role to Keynesian “animal spirits”—emotions that influence confidence-- that gives almost unfettered scope to changes in beliefs. Anything can happen.

We will argue that while RE equilibria may tie our hands *too much*—the set of possible equilibria is unrealistically restrictive—theories of “animal spirits” tie our hands *too little*. When there is too large a disparity between reality and beliefs, beliefs will change; and the change in

³ See *e.g.*, Piketty 1995. Benabou and colleagues have augmented the standard Bayesian approach with a framework in which individuals strategically choose the probability that they will remember certain signals. Agents take that filtering process into account *ex post* in assessing the reliability of their beliefs. If the value of distorted beliefs depends on the incentive properties of the institutions that agents face, there will be interactions across agents in cognitive choices that produce ideologies and “groupthink” (see Benabou and Tirole 2006 and Benabou 2007). For example, because of hedonic anticipatory utility, the size of public sector capital will affect individuals’ incentives to hold certain beliefs about government vs. markets. Because capital is a state variable, this model can also explain continuities in belief.

beliefs will change behaviors and thus the reality. We illustrate in the context of race a theory that allows us to demonstrate that the set of equilibria is larger and more robust than the set of RE equilibria that have been used to explain the unequal treatment of equals. The theory has implications for both institutional rigidity and change.

In this paper, we combine experimental work in psychology and behavioral economics and the economic analysis of behavior with an historical analysis. To set the stage, we begin with an extensive historical discussion that demonstrates that racial categories are a social construct that have had significant economic consequences. Racial categories were created at particular points in time and have persisted. What is remarkable is the similarity in some critical respects of the historical patterns that we relate drawn from different periods and different places. For social scientists, such repeated patterns necessitate explanation. But the patterns that are repeated over and over again in history are virtually impossible to explain with an RE model. We know, for example, from experiments with subjects who are junior high school boys in India that children in castes that were traditionally Untouchable can solve mazes as well as high caste children (Hoff and Pandey 2005, 2006). Yet when students' caste identities are publicly revealed, the performance of the low caste falls in both absolute terms and relative to the performance of the high caste. We infer that in other possible worlds, the Untouchables could have been an equal or dominant group. There are no intrinsic differences in ability. It is clear that a social construct has affected behavior.

In summary, several features distinguish the approach to societal equilibria and change that we develop here from the neoclassical point of view.

1. *Beliefs play an augmented role.* Individual behavior is based on beliefs that are more complex than those reflected in judgments about probabilities of the occurrence of

different states of nature. As in an RE equilibrium, in equilibrium these beliefs are self-confirming; when they are not, beliefs change. Beliefs affect behavior, which affects outcomes, which affect beliefs. But unlike an RE model, *beliefs also affect what is perceived*: the categories into which information is placed, and how information is absorbed and filtered. We recognize that individuals are not so fine-tuned as to perceive all changes. Biases—“pre-confirmatory” and “confirmatory” (terms to be explained later in the paper)—shape perceptions, widen the set of possible equilibria, and make them history-dependent.

2. *Many beliefs, including the categories into which information is placed, are social constructions.* Individuals do not choose their “software” in isolation, but within a social context. A set of collective beliefs (ideologies) that serves a society—or some group in society—well under one set of economic circumstances may serve it less well under another. The historical examples below show how in such situations, beliefs change. In the examples below, the beliefs that emerge are advantageous to some dominant group. But it is not as if that group got together and figured out a set of beliefs that would accomplish what they sought. Our theory is thus incomplete. But we believe it is a step forward to break out of the mold of rational expectations, in which the variables described above play no role.

3. *The general beliefs about the world are a state variable that determine which beliefs are acceptable.* A final difference from the neoclassical perspective is that redistributive institutions function because they have “legitimacy,” because they are accepted. Acceptance and legitimacy are a function, too, of collective beliefs. An institution (like Jim Crow) may be accepted at one time, and not at another. It may be part of an

equilibrium at one time, and not at another.⁴ We recognize that institutions depend not only on economic variables, but also on the set of general beliefs about the world, which are a state variable. Collective beliefs that emerge in one period shape the possible institutions in the next.

An institutional arrangement is an equilibrium if the outcomes lead to beliefs that support that institutional arrangement. *What we want to explain with respect to the societal belief structures (the ideologies) is what the statistical discrimination literature explained with respect to structures governing interactions between firms and workers.* There can be multiple such institutional equilibria, each of which is stable and robust. History can affect which equilibria we are in; and changes in “reality” (in, say, technology) may eventually upset a longstanding equilibrium.

The next section presents an extensive historical discussion of the evolution of the social construct of race. We follow that by a brief discussion of the standard literature attempting to explain inequality by statistical discrimination. This sets the stage for our more extended theory, which is divided into three parts: a general discussion in Section 3 of the theory of individual behavior based on findings from psychology experiments; a simple model in Section 4, based on the work of Compte and Postlewaite (2004), showing how we can capture these ideas at one moment in time. In doing so, we provide a new answer to the question, *Why is group inequality so persistent?* Section 5 extends the analysis to a theory of institutional evolution, and Section 6 discusses related literature on institutional change.

⁴ At one time, some economists suggested that institutions have a simple role in society—to fill in the “holes” in markets, to remedy market failures (see, *e.g.*, North 1973). Arnott and Stiglitz (1991) and Hoff and Sen (2006), as well as others, showed that non-market institutions purportedly resolving a market failure (like incomplete insurance markets) could, in this sense be dysfunctional—they could lead to Pareto inferior outcomes. More recent literature has highlighted the role of institutions in preserving inequalities (*e.g.*, Acemoglu and Robinson).

1. History

A. From economics to politics

Whereas ethnic differences are conceived as cultural, racial differences are conceived as immutable. In many of the examples of the construction of race that we review in this section, we show how the phrase “all men are created equal” was suffused with particular meaning: *e.g.*, all Anglo-Saxon men. As one scholar notes in the context of her work on Native Americans, “belief in the dominance of the white body was not a given but *a labored creation of racial ideology*” (Chaplin 1997, p. 231, emphasis added). The examples illustrate “a common pattern of racialism in sites of European colonization after the Protestant reformation” (Hartz). A belief system cannot be imposed, but history shows that meanings do change.

i. The construction of race in the US to justify slavery

Skin color was not initially an organizing principle in the colonies that became the United States. There were multiple categories of coerced labor, and freedom and slavery were not yet associated with persons of white and black skin. In the 17th century,

a substantial number of Virginia’s Negroes were free or became free. And all of them, whether servant, slave, or free, enjoyed most of the same rights and duties as other Virginians. There is no evidence during the period before 1660 that they were subjected to a more severe discipline than other servants. They could sue and be sued in court. They did penance in the parish church for having illegitimate children. They earned money of their own, bought and sold and raised cattle of their own. Sometimes they bought their own freedom. ..As Negroes took their place in the community, they learned English ways, including even the truculence toward authority that has always been associated with the rights of Englishmen. Tony Longo, a free Negro of Northampton, when served a warrant to appear as a witness in court, responded with a scatological opinion of warrants, called the man who served it an idle rascal, and told him to go about his business. (Morgan, p. 18).

This anecdote illustrates that in mid-17th century Virginia, it was possible for a black to have no sense that his color was consequential or meaningful.

Racist beliefs about blacks emerged as the governing elite in the colonies reacted to new problems and perceived new opportunities. In 1676, in Bacon's Rebellion, Virginia's poor (primarily former indentured servants) turned against the elite—the class of men who owned the land and ran the government. Around this period, similar rebellions occurred in other colonies, as well. In response to the threat from the landless, governments abridged the liberties of servants and lengthened their terms of indenture. A second development in the late 17th century was that Virginia's heavy mortality rate fell. Between 1625 and 1660, Virginia was a death trap, with a death rate “comparable only to that found in Europe during the peak years of a plague” (Morgan, p. 19). Once the death rate fell, as it did before the end of that century,

an investment in slave labor was much more profitable than an investment in free labor; and the planters bought slaves as rapidly as traders made them available...Slaves probably already constituted a majority or nearly a majority of the labor force by 1700.” “As the number of slaves increased, the [Virginian] assembly passed laws that carried forward with much greater severity the trend already under way in the colony's labor laws. *But the new severity was reserved for people without white skin.* The laws specifically exonerated the master who accidentally beat his slave to death, but they placed new limitations on his punishment of ‘Christian white servants’ (Morgan pp. 25, 26, emphasis added).

An important advantage of slave labor compared to English-born indentured servants was that slaves had no rising expectations; “no one had told them they had any rights.” Thus African slave labor provided an opportunity for repression that imported labor from England did not:

“discontent [by African slaves]...could be repressed by methods that would not have been considered reasonable, convenient, or even safe, if applied to Englishmen. Slaves could be deprived of opportunities for association and rebellion. They could be kept unarmed and unorganized. They could be subjected to savage punishments by their owners without fear of legal reprisals. And since their color disclosed their probable status, the rest of society could keep close watch on them. It is scarcely surprising that no slave insurrection in American history approached Bacon's Rebellion in its extent or in its success.” (p. 27)

Penal codes support this assessment. In 1712 South Carolina passed laws that became the “model for slaved codes in the South” until the end of slavery. They forbade schooling,

travelling, church attendance, land ownership, and inter-marriage (Fishel and Quarles, 1976, p. 21). Thus, as the former slave Frederick Douglass () wryly noted, “the ‘inferior’ group was outlawed from bettering itself.”

It was “at the very point in time when large numbers of men and women were beginning to question the moral legitimacy of slavery” that the idea of race came into its own (Lacsh, cited in Fields 1982, p. 152; see also Faust 1981). Out of this process, two fictions emerged. The first was the biological inequality of human beings with black and white skin. The second was that there were only two groups—bright lines between categories were defined (and redefined); a continuum was never recognized.⁵

ii. The British imperial narrative in India

We next use the account in Dirks (2006) of the nine-year trial of Warren Hastings to consider the emergence of a racial idiom for Indians during the period when the East India Company consolidated its control over broad parts of India. The East India Company in the 18th century was supposed to have been a trading company, with an eastern monopoly vested by Parliament. However, it “had become a rogue state: waging war [almost constantly]..and collecting revenue over Indian territory” that produced massive private fortunes for the traders (pp 9,. 13) . The activities of the company’s employees contributed to famine conditions in Bengal and “successive crises around the fundamentals of English politics, culture, and society.” The private trade was based on the misuse and abuse of grants, treaties, agreements and understandings between the Company and rulers in India. In his opening speech at the trial, in 1788, Edmund Burke declared, “I impeach [Hastings] in the name of the English constitution, which he has

⁵ Explaining why it was “useful” to have only two groups would take us beyond this limited paper. But see Rothman 2003.

violated and broken, --I impeach him in the name of Indian Millions whom he has sacrificed to injustice—I impeach him in the name, and by the best rights of human nature, which he has stabbed in the heart” (p. 105). Burke protested against Hastings’ “geographical morality”: “We think it necessary in justification of ourselves to declare that the laws of morality are the same everywhere” (p. 107).

But over the course of the nine-year trial, perhaps the major spectacle in England in the late 18th century, something happened: “the well-known scandals of the East India company ... became either forgotten or subsumed with the imperial narrative of an exhausted land that virtually invited the British to conquer it....the social political cultural and economic buoyancy of India in the 18th century was not just forgotten but suppressed” (p. xii). After the trial, “*scandal itself became institutionalized* [;] it was displaced onto a civilizational map [entailing...] a [broadly] shared condemnation of the Indian present” (p. 24). “Scandal became normalized in the *assumptions and categories of modernity itself*” (emphasis added). The British now controlled not only broad swathes of India, *but also Indian history*. “Built on fabrication, colonial history [used] imputed barbarism [of the people of India] to justify, and even ennoble, imperial ambition” (p. 5). The British came up with the notion that Indians were children in need of supervision. Burke’s rhetoric in the trial exposed the strains of empire-building in the post-Reformation West, and contributed to the emergence of “new vocabularies of legitimation and political right to overcome the scruples Burke so eloquently raised when dominion abroad had to be justified” (p. 206). After the trial, there emerged the “justificatory logic that the good despotism provided was much better than the bad despotism Indians had known before conquest” (p. 207). “Drawing a veil across the oppressions of history was necessary in order to sustain the legitimacy of governance as well as of civil society” (p. 350 *n*

61). The trial ended with the repression of all ambivalence around the colonial guilt that gave rise to the trial in the first place (p. 85; p. 355).

iii. The emergence of a racial idiom for Native Americans

The examples above illustrate a pattern of racialism in sites of European colonization that entailed the expropriation of labor and land rents. A similar historical pattern emerged to justify the wholesale expropriation of land in the case of Native Americans and Australian Aborigines.

A racial idiom emerged for Native Americans beginning in the mid-17th century. In the mid-17th century, it was still common to argue that “Nature knows no difference between Europe and Americans in blood, birth, bodies, &c.” (*The tears of the Indians*, 1656, cited by Chaplin 1997, fn. 37). But by the 18th century, the cartography Bernard Romans argued that it was “by no means reasonable” to designate the Indians as Americans (Chaplin, p. 230). “The English contended that the Indians were ill-adapted to *any* region” (p. 248, emphasis added). They were a physically inferior race. The English

“used that explanation to usurp the very habitat of Americas’ pre-Columbian natives.... English discourses of nature and the human body were fundamental to their imperial project. The proof was in the body.” “These beliefs [of Indians’ physical inferiority] were not universal, nor did they fail to elicit disagreement...But a good measure of the persuasiveness of the argument for English physical superiority was the fact that it appeared even in the writings of colonists who were sympathetic to Indians and who otherwise argued for native hardiness” (Chaplin pp. 232-233, 250).

iv. The “expulsion” of Aborigines from the human race

Aborigines were classified as British subjects. “The early governors [in the 17th century] wanted to see them converted to Christianity and farming so that they could be absorbed, socially if not genetically, into the lower class of the colony—an idea loathed and resisted by every white

[in Australia], no matter what his class.” (Hughes, 1987, p. 275). The conflict over land rights between settlers and Aborigines resulted in violence in which settlers shot Aborigines indiscriminately. In 1805, the King’s judge-advocate ruled that because “Aborigines had no grasp of such basics as English law as evidence, guilt, or oaths, they could neither be prosecuted nor sworn as witnesses...And so the best course would be to ‘pursue and inflict such punishment as they may merit’ without the formalities of a trial.” The restrictions on Aboriginal testimony in court meant that evidence from a white witness had to be acquired to prosecute the killing of an Aborigine. Such policies made clear to settlers the inequalities of settlement and ushered in a new wave of dispossessions and violence. One cattle proprietor remarked that “there was no more harm in shooting a native than in shooting a dog” (Hughes 277). Over time, “Force and punitive expeditions became an *institutionalized* way of dealing with the Aborigines” (Elkin, 1938, p. 364, emphasis added).

For a convention to become legitimate, it needs to have some justification beyond mere convenience. “The settlers...asserted that they [the Aborigines] could not be civilized.” (Elkin 364). One historian characterizes the efforts to justify the policies towards the Aborigines as leading to the expulsion of the “Aborigines from the human race and ... the development of a Herrenvolk democracy in Australia” (McQueen p. 115).⁶ The ideology regarded “Aborigines as inferior, unintelligent, lazy, irresponsible grown-up children, acceptable and even lovable, as long as they were ‘kept in their place’” (Hartwig 1972, p. 14). Taz (p. 97-109) describes over 30 statutes enacted in Australia that ascribe certain characteristics, usually negative, to Aborigines, including the inability to manage their own affairs and property, unworthiness for

⁶ The notion of “pollution” arose as well. For instance, a Chief Justice who later became a Governor-Genera warned against the “contaminations and the degrading influence of inferior races” (Encel p. 32).

inclusion in industrial awards, inability in relation to certain rules of evidence in courts, and the inability to govern their communities.

Racial ideology that emerged in Australia, like that which emerged in the US colonies, was a solution to the dilemma of treating humans merely as ends to someone else's purposes in the post-Enlightenment period. In the context of slavery, Montesquieu famously satirized this dilemma: "It is impossible for us to suppose that these beings should be men; because if we suppose them to be men, one would begin to believe that we ourselves were not Christians" (cited in David, 1975, p 302). This dilemma did not occur in the West before the Enlightenment. We illustrate this in the next example.

v. Slavery without race in antiquity

Classical sources explained bodily variation in nonracial, environmental terms. "All humans are potentially the same, and adult specimens differ owing to the physical and cultural milieux in which they take final form. Natural philosophy nonetheless stressed an underlying, universal human similarity" (Chaplin, p. 230). . Slaves were obtained through warfare and colonization, and slavery was perfectly consistent with general beliefs of justice and the way the world works. Evidence for this point is from Thucydides Melian dialogue. When the Athenians landed on the island of Melos, the Melians asked for mercy, invoking their goodness in the eyes of the gods. But the Athenians went ahead and killed all the men, sold the women and children as slaves, and colonized the island. The Athenians justified their action this way:

"Of the gods we believe, and of men we know, that by a necessary law of their nature they rule wherever they can. And it is not as if we were the first to make this law or to act upon it when made; we found it existing before us, and shall leave it to exist for ever after us."⁷

⁷ I thank Varun Gauri for this quotation.

Slaves in antiquity served in high- as well as low-status occupations, depending on their education and talents. There was no association between slavery and innate differences between slave and slaveholder.⁸

B. From politics to beliefs

A striking implication of the example of race is that categories that were defined by politics were represented as natural and objective. Telles (2004) found that the probability of an interviewer classifying an individual in the same way that he classifies herself to be only 22 percent for self-identified black females, leading one reviewer to conclude that “any attempt to make sense of a Brazilian racial landscape must rely heavily on the background factors used to invent race in the first place [and not on phenotype]” (Lieberman, 2008, p. 11). We next argue that the social constructions of race were entrenched and embedded in individuals’ psychology through symbolism, ritual, and protocol.

In Australia,

“More than simply a technique of control and governance, the racialised designation of space [in the 1911 Aboriginals Act] expressed and reproduced social and ontological categories on which colonial society was founded.” (Cowlshaw, 1999, p. 63)

Rituals reinforce the ideology by humiliating the “inferior” race. Individuals enact the ideology as a lived practice. The cultural baggage prevents psychological distancing. No one is allowed to forget that race is a salient category and who he is in the racial hierarchy. In the Jim Crow south, the unwritten rules that governed day-to-day interactions across race lines have been seen “not only as a form of social control but also as a script for the performative creation of culture and of ‘race’ itself (A-Ritterhouse, Boyle). As Charles Evers (brother of the murdered civil

⁸ Another example is Russian serfdom.

rights activist Medgar Evers) explained in his autobiography, “Our mothers began telling us about being black from the day we were born. The white folks weren’t any better than we were, Momma said, but they sure thought they were’—which Evers implied, amounted to much the same thing.” Violations of racial etiquette could lead not only to individual lynchings but to massacres (Dailey 1997, p. 561). The etiquette of subservience and dominance in the Jim Crow South has also been identified in Australia (Hartwig 1972, p14), in Brazil (where a former slave could lose his freedom for violations of etiquette), and in India (where criminal penalties were applied to low caste individual who wore gold or rode bicycles) (Connerton, 1989, p. 10).

Although socially constructed, part of the power of racial categories depends upon their not seeming to be constructed (Lessig p. 951). Although the beliefs clearly evolve over time, the beliefs come to be represented as old. As the saying goes, history is written by the conquerors. For instance, white southerners repressed the history of biracial parties in the 1870s-80s.

“in real political terms an idea dies, in this case the idea of black political participation and rights. ..Clearly, limiting subsequent generations’ worldview by encouraging them to ‘forget’ alternatives is a subtler form of political repression than shooting one’s political opponents. But it is not a trivial form of repression...Here it is worth thinking about the word ‘repression’ in its psychological, as well as political, sense, for to repress successfully is to forget what one is repressing” (Ritterhouse, 9-10).

In Africa and India, colonial power invented “traditions” to give content to the “natural” differences between groups (see, *e.g.* Hobsbawn and Ranger 1983, and Dirks 2001).

2. Early literature on self-confirming racial constructs

A large literature attempts to explain as part of a rational expectations equilibrium the persistence of racial discrimination when there are no inherent differences between groups.”⁹ In the

⁹ We note that one of the seminal papers on discrimination in economics argued that discrimination could not persist; by inference, any persistent wage differences reflected inherent differences in ability. The extreme

statistical discrimination literature, fully articulated rational expectations (RE) models have multiple equilibria. There is an equilibrium in which firms believe that workers categorized in different groups differ in ability, and those beliefs affect incentives that make the beliefs self-fulfilling. Given everyone else's beliefs, there are no gains to be reaped from improving the use of existing information. There is a *coordination failure* of beliefs. Institutions play no part in this explanation.

The central limitation of that literature is that *it takes the cognitive frame of race as given*, *i.e.* that it is a characteristic that individuals observe and believe is salient. This literature does not explain why that is the case. It thus ignores the question to which these historical episodes call our attention.

If the categories were platonic, and/or if the world were rich in data and the costs of processing data were zero, then everyone should have the same beliefs. However, common knowledge is not an accurate description of society. Because people do not have rich enough data (see *e.g.*, literature on one-armed bandit problem), several mutually exclusive explanations are almost equally plausible with the data people do have or are likely to obtain. There are multiple possible frames. Bayesian priors may determine which of those beliefs come to be held.

People build ideologies to resolve these indeterminacies. These ideologies “shape” both the Bayesian priors and the way individuals process information. They shape the categories into which the infinite possible sets of information are placed. They even shape what information people “receive.” As shown in the literature on *confirmatory bias*, hypotheses shape what people pay attention to and what they rationalize away (see the references in Rabin and Shrag

assumptions underlying the analysis served one salutary purpose—eliciting a large literature explaining what was wrong with the theory. See, Gary Becker and {critiques}

1999). Rabin and Shrag show that this can make the hypotheses self-perpetuating even under an infinitely repeated experiment that *optimally* tested the beliefs.

But there is an even deeper issue. It is not meaningful to say that an individual conditions his actions on everything that is observable, since he doesn't know what is observable. What is observable interacts with an *infinite* data set and a *finite* set of social constructed categories. Below we describe the resulting bias as *pre-confirmatory bias*.

The story we will tell in this paper goes beyond the literature on statistical discrimination in several ways. First, it observes that in general people do not condition on all relevant variables. *There does not exist a unique, natural set of frames or categories*. Frames are themselves a convention and a consequence of social interaction. Thus, a complete model needs to explain these. *Our approach differs from rational expectations in that it assumes that individuals start with priors (primitive beliefs) that might be called ideologies, and it tries to explain those ideologies and their evolution*.

Second, societies act as if the dominant group could impose an ideology – an integrated system of beliefs, assumptions, and values—that reflects its needs and interests. There are often ideologies that could lead to equilibria that are favorable to the dominant group. The set of admissible ideologies is constrained by a set of intrinsic values, perhaps based on some unquestioned truth, to which an ideology must conform in order to be legitimate (what might be called “a super-ideology” that might evolve more slowly than the ideology, just as the ideology itself may evolve more slowly than the beliefs that attempt to reconcile observations of reality with the ideology.¹⁰)

Race served as a way to structure hierarchy beginning in the 16th century. In the post-Reformation, the idea emerged that individuals should have some control over their destiny. In

¹⁰ As we explain below, the super-ideology determines the “logic” of analysis.

the context of our discussion of race, “the super-ideology” in the post-Protestant reformation world is that humans could not be treated only as means for someone else’s ends. After the spread of the ideals of the Enlightenment, the super-ideology tightened the constraints on the scope for one group to appropriate the labor or land of another group, since the ideal became that equals have to be treated equally. These constraints, combined with the drive for domination of a powerful group, created powerful incentives for the dominant group to create an ideology that identified primal differences among groups. Thus for example, Davis (1975, p 303) argues that race became “the central excuse for slavery.” In the model we present in the next section, racial doctrines (of inferiority) will take on a life of their own, affecting behavior in such a way that the ideology is self-sustaining. Because individuals do not process all signals and because ideologies focus attention on certain phenomena, those beliefs will be more stable than would be the case under rational expectations.

3. Psychology: Going beyond the economists’ usual models

There is ample evidence that individuals’ beliefs about themselves affect their behavior. The question is why. The economics literature suggests several explanations—individuals who think they are being unfairly treated will work less hard, a variant of the “efficiency wage” literature (see Akerlof and Yellen; Stiglitz). Here, we draw on the psychological literature, which identifies several other effects.

A. Confidence-enhanced performance

Why would confidence affect performance? Experimental work has identified an effect of mood, powerlessness, identification by others, and social identity on self-confidence and achievement.

i. Mood

Experiments summarized in Compte and Postelwaite (2004) find that psychological states can affect performance. Good or bad mood is induced in subjects, e.g. by having them read aloud sequences of depressed statements like “I feel a little down today” vs. reading aloud neutral statements like “Santa Fe is the capital of New Mexico” ; or seeing a happy vs. a sad film clip. The induced negative mood treatments impaired the ability to detect contradictions, speech articulation, physical reaction time....

ii. Feelings of power

The psychologist Pamela Smith manipulated in a series of games the feeling of powerlessness on the part of experimental subjects. For example, she told them that they would play in the future a game in which they would have an assigned role either as boss or person supervised. She finds that cognitive processes of lacking power impaired performance in updating, inhibiting, and planning.

iii. Stereotype threat

A very robust experimental effect is that when identity associated with a stereotype, or a condition that could confirm a negative stereotype is manipulated, performance shifts in the

direction of the stereotype. This might be because there is a norm about performance. An agent chooses a level of effort to exert to accomplish a task. There is a substitution effect and an income effect of a belief in low ability. The experimental findings show that the substitution effect dominates.

Even when there is no norm about how difficult a task is, making stereotypes salient affects performance. Why? One way to explain this experimental finding is by adopting the model of individuals with multiple identities, the salience of each can be manipulated.¹¹ In doing that, an individual's prior belief in the difficulty of the task changes. Each identity has its own priors, its own heuristics. In contrast, in a Bayesian model, reminding a person of his caste/race would change nothing. Experimental results on stereotype threat show how race/caste salience affects behavior, and provides evidence against the unitary self model.

While ideas can give comfort to “bad” behavior, and these ideas can even affect individual psychology and behavior, our concern in this paper is explaining stability and change. *We argue that beliefs should be treated as state variables.* This means that beliefs instilled at one point of time may persist. A set of beliefs designed to extract rents from one group (as in the case of race) affect the future equilibrium *after* the extractive regime is removed. Two features of how the mind works enable us to link such beliefs and the future equilibrium.

¹¹ This is one of the fundamental differences between the standard economic model and models that have increasingly been found useful in other social scientists. To an economist, an individual has, at any moment of time, a well-defined set of preferences. (Of course, preferences may change, e.g. as a result of addiction, and this presents challenges for defining welfare norms.) The well-defined preferences provide all the information that is relevant for describing his behavior, i.e. his choices. By contrast, in some of psychological literature, an individual is conceived of as having multiple identities (possible sets of preferences), which can be “expressed” at any point of time. Which is the “real” person? It is possible to describe more fully the behavior of the individual by describing the circumstances in which one kind of behavior or another is exhibited. That is, behavior depends on context. [references to be added]

B. Confirmatory bias

Rabin summarizes a large literature that finds that one's beliefs shape what people pay attention to, with the result that hypotheses can be maintained even when it is false and an infinitely repeated experiment optimally tests the belief. One widely shared belief among people is to think well of themselves. [examples to be added of how most people view themselves as well above average; see also Weinberg 2006]. But systematic factors appear to influence confirmatory bias. Depressed people do not have this bias (Alloy and Abramson 1979, Ackermann and DeRubeis). We can also see the responsiveness of one's self-image to variations in the environment in the following a beauty experiment: An interlocutor who thinks he is talking to a beautiful woman elicits from her on average fewer self-deprecating comments than does an interlocutor who thinks he is talking to an unattractive woman. That is, identification by others contributes to an individual's sense of self. This provides evidence of a mechanism that could sustain a sense of inferiority among the historic targets of racism even after socio-economic conditions have changed. Social identity affects perceptions, emotions, and behaviors. Huey Newton (1967, p. 16) (co-founder of the Black Panther Party) described the lower socio-economic American black male in the 1960s as

“a man of confusion. He faces a hostile environment and is not sure that it is not his own sins that have attracted the hostilities of society. All his life he has been taught (explicitly and implicitly) that he is an inferior approximation of humanity. ... “his attitude is that he lacks innate ability to cope with the socio-economic problems confronting him... The parents pass it on to the child and the social system reinforces [it].”

C. Pre-confirmatory bias

Confirmatory bias implies that agents are selective about the information that they see and hear and remember, with a bias towards processing information that confirms prior beliefs. *Pre-*

confirmatory bias means that the information agents collect is structured. They don't collect data on race if they have a prior that race is irrelevant. If they have the data, they don't use it. Agents need a model to put their perceptions into categories. *To put this another way, agents take for granted certain categories, and this affects even what information they gather.* Someone who did not think that race was a salient characteristic would not gather or observe information about the relationship between race and performance. There are an infinite number of possible "correlations," e.g. between eye color, hair color, height, etc. and performance. Individuals do not "gather" information about these possible correlations because, in a sense, the way we see the world says that they are irrelevant. If we came to believe that they were relevant, they possibly would be (see a related discussion in Loury 2002).

4. The model

This section uses the specific model of technology and of confidence-enhanced performance in Compte and Postlewaite (2004) to illustrate the idea of an equilibrium social construct—*i.e.* an ideology that can be maintained in equilibrium even though it is false.

Two races. There are two "races:" green and red. Every individual is categorized as a green or a red. Historically, reds were represented as inferior.

Technology. Individuals can either fail or succeed at a task. Confidence enhances the success probability. $p = p(\phi)$, where ϕ is a measure of confidence. Figure 1 shows the relationship.

Biased perceptions. The model captures the well-established human tendency to take credit for success but to deny responsibility for failure by assuming that, in the absence of

cultural constraints, an individual will not recollect some of his failures. In particular, consider a series of true successes and failures, denoted by 1 and 0, over time. Letting s and f denote *observed* successes and failures, if a person experiences a series {010101}, he might recollect only the shorter series { $fsfs$ }. The belief formation process is characterized by asymptotic consistency, a condition that rules out a permanent divergence between the agent's perceived success and failures and his beliefs. That is, *given his perceptual screen*, his beliefs are correct in the long run. This is a kind of "almost RE": beliefs have to match what is perceived given that "the agent is ignorant of the fact that the process by which these data are generated might be biased and lead him to biased beliefs." (Compte and Postlewaite p. 1542). Let γ denote the fraction of failures that are not recollected. Compte and Postlewaite prove that in the long run, asymptotically, for given γ , there is a unique value from ρ to ϕ ; denote this $\phi(\rho)$. [explanation to be added]

Because the implicit assumptions on which race is based and which form the context of race are taken for granted, and because reds were historically represented as the inferior race, race constitutes an additional largely unconscious perceptual screen that determines how one views data. A person's natural bias towards not recollecting failures but counting all successes will be constrained if he is red. We capture this idea by assuming $\gamma_{\text{green}} > \gamma_{\text{red}}$. Figure 2 shows the relationship between the frequency of success ρ and the long-run belief about the probability of success, ϕ , for each race. .

Equilibrium. Figure 3 superimposes the graphs in Figures 1 and 2. The equilibrium points are the intersections of the graphs. In equilibrium, the belief based on observations generates a level of performance that is consistent with those biased beliefs. The result in this simple model is that a social construct will be self-fulfilling.

Robustness We now deal with two further questions: will this false belief system be robust? If there is a fixed cost to changing it, we will argue that the greens may not want to change it, and the reds will have limited ability to change it. Thus we can explain persistence of race and of racial inequality long after the legal barriers to equal opportunity have been removed and the conditions that gave rise to them have changed.¹²

In the model constructed so far, there are no economic interactions. The reds and greens could be solving puzzles on their own. The only benefit from racially disparate performance is associated with another attribute of individual psychology: individuals' sense of well-being is affected by their relative position. The greens may feel better about themselves if they are doing better than the reds. This alone would give them a reason for reminding the reds of their race.

To construct a robust discriminatory equilibrium, we embed the model into an equilibrium ecology in which now there is a production function that requires skilled and unskilled labor. The more powerful group says to the less powerful group, "you're red." By calling them reds, the first group necessarily calls itself greens, and there is nothing the reds (being the momentarily less powerful group) can do about it. If the resulting loss of self-confidence makes the reds more likely to be complements to greens' labor than substitutes, the greens benefit by reminding the reds that they are reds even after slavery is over and the "free market" is reinstated.

What is striking is that this is precisely what happened in the Jim Crow South. van den Berghe (1978, p. 30) describes two types of race relations: (i) a paternalistic system (master-

¹² Note that if the racial system had allowed an overlapping distribution of abilities between reds and greens, all reds could then view themselves as relatively superior reds, equal to greens, and then differences between reds and greens might not be self-confirming.

servant model) and (ii) a competitive system (associated with industrial and urban societies). In this typology, in the second type of race relations, segregation occurs; race plays a role in the division of labor; and the dominant group's image of the lower caste changes from "one of backward ... children to ... dishonest, underhanded competitors for scarce resources... virulent hatred replaces condescending benevolence."

It was perhaps not inevitable that race relations of type (i) change to type (ii). There were periods in the US South in which biracial parties existed and blacks exercised equal political rights with whites. But these periods ended by 1900 (Dailey 1997). Jim Crow was an institution that, in effect, forced (or led) even those who might have been reluctant to act in a discriminatory way to do so. What was remarkable was how long the institution lasted. It was a dysfunctional institution—overall societal productivity would arguably have been far higher in its absence. But it persisted nonetheless for more than six decades

5. Institutional change

In modern economics, institutions are often conceptualized as the "rules of the game" that govern cooperation. The focus is on economic equilibrium: rules, together with technology and information sets, shape outcomes. But clearly, *institutions also shape how individuals see the world, how they receive information, the categories they use*—they affect beliefs, and those beliefs also affect behavior.

One can think of institutional behavior and dynamics much as we have thought of individual behavior. In both cases, beliefs are central. Standard theory has emphasized the role of beliefs (or expectations) about the behavior of others. But beliefs also matter because individuals must decide whether or not to conform to a particular set of rules. If individuals were

to decide, for instance, not to conform to the rules, the outcomes would differ (from what they otherwise would have been). This will necessitate a change in the “rules,” *i.e.* in the institution. It is possible that the punishments for not following what were the rules might change, or it is possible that the rules themselves would change. Whether individuals conform to the institution depends on the legitimacy of the institution—which is a matter of beliefs, often what we might call higher order beliefs, that is, an ideology. In judging the legitimacy of an institution, individuals may look at either the outcomes or the processes. A set of outcomes, *e.g.*, the market, that was viewed as legitimate under one technology might become viewed as unacceptable under another if it led, for instance, to greater inequality than current ideologies viewed as acceptable. Something would then have to change: the institutional arrangement could change, or the belief systems could.

The story that we have told is that institutions at time t together with beliefs and technology at time t shape outcomes at time t , which shape beliefs and institutions at $t + 1$. Institutions shape how we see the world, and this can give them robustness. But it can also give rise to “institutional breaks” (of which revolutions are one manifestation). Not all individuals process information the same way. Institutions lead some individuals to process information in ways that lead them to support the existing institutions; but others increasingly see discrepancies between the underlying ideology (beliefs) and outcomes that make the institution unacceptable.

Interests play a large role. Those whose interests are served by the current institution are less likely to perceive these disparities.¹³ But while technology is one driver of institutional change, beliefs themselves can have their own dynamic. The ideology that “all men are created

¹³ Unlike some strands in Marxian analysis, institutions cannot be explained *only* in terms of interests. And our theory does not explain changes in institutions *just* in terms of changes in technology. We have argued that beliefs can have a (partial) life of their own.

equal” had overwhelming consequences, especially, of course, in conjunction with changes in technology.

The story we have told for the development of the institutions surrounding race is a case in point. In time t , there are differences in power between groups. As violence and exploitation become institutionalized, categories of people are defined; each individual is assigned to a category; each category is made subject to a different legal order. *Given the belief that “all men are created equal,” the violence and exploitation endogenously give rise to a change in cognitive conventions.* In time $t + 1$, each category is represented as *essentially different* from any other. These constructs now shape how individuals categorize others and themselves, and the confidence that they have in themselves.

Over time, the outcomes of this system increasingly were perceived as disjoint from prevailing ideologies of social justice, at least by those who were not direct beneficiaries of this system. That ideology was so ingrained that it could not change; and that meant that eventually the institutions themselves had to change. Yet even after Jim Crow and other institutional arrangements had changed, behaviors based on those institutions persisted because of the persistence of certain beliefs (which were at least partially justified by observed behaviors.)

This helps explain why societal change is so difficult. One can legislate changes in formal institutions, but one cannot legislate change in the beliefs that support certain behavioral patterns. If it’s the case that mindsets—classification systems, grammars, logics—are economic state variables, then institutional change faces a whole new set of obstacles. In our model of persistence, for example, racial identities are a constraint.

This model of institutional change also identifies new opportunities for change that do not exist in the standard model: *e.g.*, changes in perceptions can create ideological strains that

trigger change; what was an equilibrium may cease to be an equilibrium. A politician or a pundit that reframes the way people see the world can help bring about a new institutional dynamic.

The coherence of an institution arises from how it shapes the way people think about new problems. Developing societies constantly confront new problems. Institutions can be thought of as providing a “logic” by which new problems are analyzed and resolved. But besides this “logic” (what might be called the grammar or language within which discourse occurs and differences get resolved), institutions are founded on a story or analogy that lends legitimacy to the institution; it is why individuals come to accept it. The importance of legitimacy has been enhanced over time as members of society have grasped that a given set of institutions are not fixed by nature: there are alternative institutional arrangements that might have governed their interactions. Those who are disadvantaged by a particular set of institutional arrangements may thus question its legitimacy.

This paper is, in part, about societal rigidities—non-development—and societal change. Change can occur when the logic of an institution leads to an outcome inconsistent with the underlying “story” or ideology. Robust institutions make it difficult to see these disparities. They filter all information that is inconsistent. There is, to use our earlier vocabulary, *pre-confirmatory* and *confirmatory bias*. But sometimes, the disparities are so large that at least for certain segments of society, the evidence breaks through these cognitive barriers. *The broad story of history is one of changes in beliefs*. These can drive change in both individual behavior and the institutions that govern the interrelations among them.

We have critiqued other models that try to explain how groups that are inherently the same can have different outcomes. We showed that, historically, powerful people create a myth (but a myth which, in some sense, turns out to be self-confirming) to sustain power. Why not

just create a norm, as in the models of Akerlof (1976) and Abreu, Pearce and Stacchetti (1990)? One objection to that work is this: the norm is self-enforcing only if the interest rate is low; and the equilibrium is fragile to information asymmetries (not getting caught for not enforcing the norm). A second objection is that, given their beliefs, in the Abreu, Pearce, Stacchetti model it would be in the interest of the reds to secede from their own society. That they do not do so makes the model internally inconsistent.¹⁴

Our model is more robust. We replace particular assumptions about information asymmetries with particular assumptions about behavior and beliefs. Both, of course, capture elements of the truth. Their effects might be complementary. *But the source of robustness of racial inequality would seem to be better explained in our model than in the existing ones, and the existing models (nor any other RE model) would seem to be unable to account for the historical patterns summarized in Section 1.* Self-policing in our model occurs at a deeper and more abstract level than that of enforcement of discrimination, which is the subject of the caste inequality in Akerlof's model.

While the approach taken here is outside the norm in economics, it has important antecedents in institutional sociology. Mary Douglas (1987) argues that what institutions teach people is how to “see,” how to “think,” what sets of things are “similar,” and what are the important categories. She argues that the theory of rational behavior by which “each thinker is treated as a sovereign individual” has insuperable difficulties. It cannot account for the set of cognitive classificatory frameworks within which choosers choose, which are themselves collective. Institutions are legitimated by some persuasive fiction or analogy; “the entrenching of an institution is essentially an intellectual process as much as an economic and political

¹⁴ Even if there were economic interdependencies (*e.g.* arising out of complementarities), the threat of secession would affect the extent of equilibrium discrimination that could be observed.

one...To acquire legitimacy, every kind of institution needs a formula that founds its rightness in reason and in nature.” (p. 45)

This tradition of work leads to a richer view of institutions. An institution is something that categorizes and gives meaning to, or provides an interpretation of, action. Thus, an institution operates both as a symbolic system and as a pattern of activity (Friedland and Alford 1991). This view suggests a broader paradigm in studying institutional change than that conventionally followed in economics, with the important exception of Grief and Laitin (2004).

6. Conclusion

Grief and Laitin note that the usual economic approach to institutions—focusing on self-enforcing equilibria of behaviors of rational agents—is inadequate to explain institutional change.

“Institutions influence factors such as wealth, identity, ability, knowledge, beliefs, ...that are usually assumed as parametric in the rules of the game. ... Such influence implies a dynamic adjustment of variables that, if this influence had been ignored, would have been considered as parameters in the stage game.”

Our paper can be viewed as amplifying the research agenda that they have laid out, focusing on the dynamic adjustment of beliefs, and noting that beliefs affect even what information is gathered. And it is not just the parameters in the game that change over time, but the game itself.

Sociologists (the “new institutionalists”) also emphasize the cognitive element in institutions and point to implications for a theory of institutional change (see Powell and DiMaggio 1991). For instance, Friedland and Alford (1991, p. 232) write that “[in a given society] institutions are potentially contradictory and hence make multiple logics available.”

Taking account of ideology can help explain persistence and change in institutions.

We agree with the institutional sociologists that the cognitive element is critical. People have choices, and the way they see them depends on social constructs. “My decision is to hire a black or a white person” is an example of a frame that is a social construct. Economists have left out social construction. But the sociologists have left out that social constructs need to be understood as an equilibrium. The challenge is to understand the path of social constructs over time.

The overarching theme of this paper is the use of ideology in certain contexts (in particular, the post-Reformation West) to naturalize grossly unequal relations between groups. We presented a simple model of biased cognition, based on earlier work by Compton and Postlewaite, in which we can formalize that the result is the persistence of inequality after the obstacles to equal opportunity are removed. The ideology takes on a life of its own, shaping the outcome in the future equilibrium. It would be surprising if there were not many other examples of this kind of institutional overhang.

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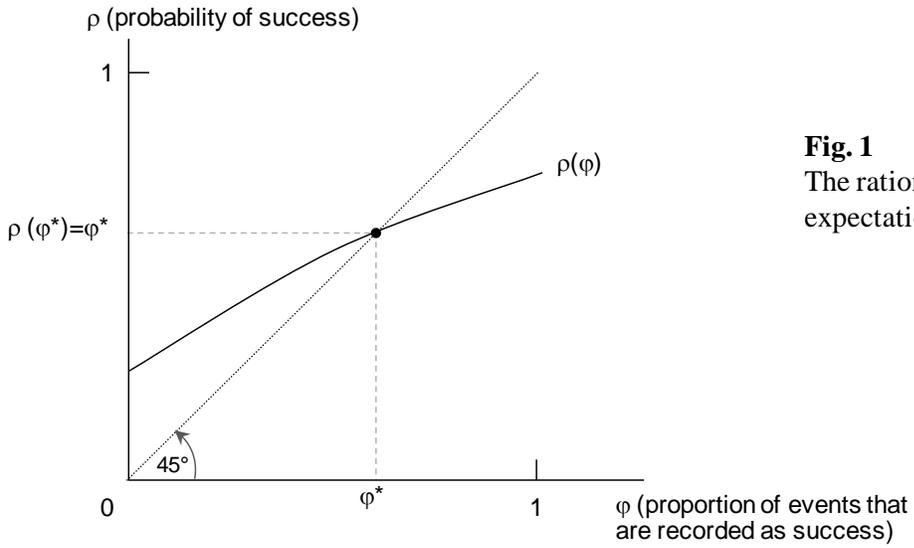


Fig. 1
The rational expectations equilibrium

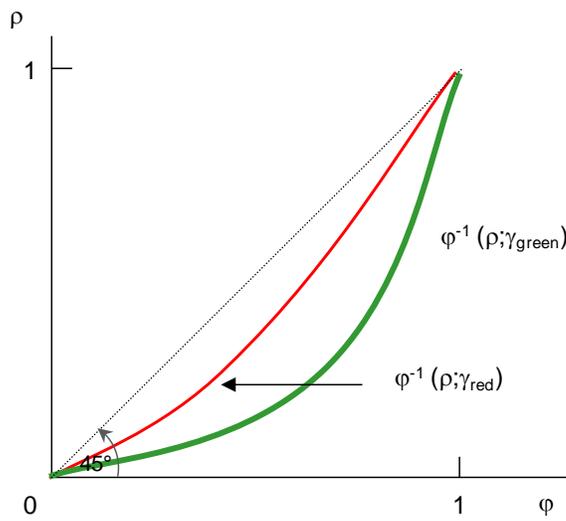


Fig. 2
Biased perceptions

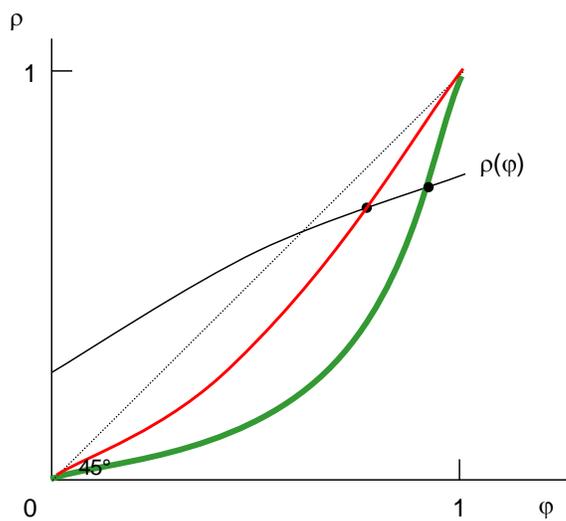


Fig. 3
Equilibrium with biased perceptions