

# **The Making of Behavioral Development Economics**

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## **Abstract**

Behavioral economics is an ongoing revolution in economics that examines aspects of decision-making left out of the rational actor model. Although scholars in the middle of the 20th century were already documenting how actual decision-making often looks nothing like what the rational actor model predicts, these early efforts were mostly ignored by economists. The modern field of behavioral economics was launched when Kahneman and Tversky showed that the mechanics of cognition produce systematic errors of intuition, and that intuition guides much of human judgment and behavior. Their work launched a research program that substitutes for the rational actor the ‘quasi-rational’ actor, who retains a key aspect of rationality —exogenous preferences— provided that he thinks very carefully. In the last few decades, economic studies have given life to an insight – long a part of sociology and anthropology – that cognition and preferences are shaped by concepts, categories, identities, narratives, and worldviews that reflect the cumulative experience of past generations. The agent in this second research program is the ‘enculturated actor’; institutions and cognition shape one another in a ‘mutual cycle of constitution.’ It is misleading to shoehorn findings related to the enculturated actor into the rational actor model. Three implications of our analysis are that 1) historical events can have persistent effects on how individuals think and cause societies to get ‘stuck’ at low levels of well-being; 2) relatively short-run interventions that give individuals new experiences can have long-run effects; and 3) by returning to its early roots in recognizing the enculturated actor, behavioral economics can help economists better diagnose and address development challenges.

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# The Making of Behavioral Development Economics

## Two revolutions in economics

Since 1970, two revolutions have been launched in economics—two massive changes in perspective of how economic outcomes are determined. The first revolution was the *economics of imperfect information*; the second, still at an early stage, is *behavioral economics*.

The first revolution brought into consideration asymmetric information, which had earlier been banished to footnotes because it was believed that it would make little difference to the workings of competitive markets. Maintaining the assumption that individuals are rational actors with fixed preferences, the economics of imperfect information showed that in market transactions in which one party has better information than the other, market equilibria are inefficient: there are policy interventions that can make everyone better off (a ground-breaking paper is Rothschild and Stiglitz, 1976).

The second revolution, which is ongoing, recognizes that decision-making entails information processing (e.g., Axelrod, 1973 and Abelson, 1981). This revolution challenges the standard assumptions of objective processing of information as well as fixed preferences. The purpose of this essay is to explore the application of this revolution to development economics and to suggest future directions. The paper is thus about the making of behavioral development economics.

It appears to be a human universal that judgments and choices are susceptible to external frames. Different, but formally equivalent, descriptions or presentations of a given set of available options (for instance, a change in the default option among a set of alternatives) can change the choices many individuals make, even when the monetary consequences

are large (Tversky and Kahneman, 1986; a well-known example is Madrian and Shea, 2001). That the individual is, in many contexts, only a “quasi-rational actor” is the central discovery of what Colin Camerer (2005) calls “20<sup>th</sup>-century behavioral economics.” The pressures of competitive markets do not correct this actor’s mistakes; markets can make them worse (Thaler, 1988; Akerlof and Shiller, 2015).

A second strand of behavioral economics, developed primarily in the 21<sup>st</sup> century, takes into account that human decision-making is systematically shaped by cultural and social environments—both past and present. Research at the intersection of culture and cognition demonstrates that humans think with cultural *mental models* (equivalently, *schemas*), including concepts, categories, identities, narratives, and worldviews, shaped by the cumulative experience of past generations (see, e.g., Denzau and North, 1994; North, 1994; DiMaggio, 1997; World Bank, 2015, Hoff and Stiglitz, 2016). Camerer (2005) suggests that a key new element in 21<sup>st</sup> century behavioral economics are *mental models* that individuals use to process information. Cognitive scientists hypothesize that when an individual tries to understand an object or event, he draws on a repertoire of conceptualized representations, for example, of stereotyped event sequences, and a particular mental model is activated when the individual expects events that he encounters to fit the mental model. A mental model has consequences that beliefs alone do not:

events are seen in relation to familiar contexts rather than in isolation, with great savings in computation efficiency, and there is a strong tendency toward false recognition of events that were not actually observed but that would fit in the mental model (Abelson, 1981, p. 716).

Our experience of reality is *mediated* by mental models.

An individual can hold inconsistent mental models (Abelson, 1981; DiMaggio, 1997; Swidler, 2001). Seemingly immaterial aspects of the social context of the moment of decision can influence which mental models are activated. An environment that primes a particular aspect of an individual’s identity can change his behavior because it makes

certain norms and associations more available to him (e.g., Steele and Aronson, 1995; Hoff and Pandey, 2006, 2014; Cohn, Fehr, and Maréchal, 2014). The person in a moment in time is not *fixed* in terms of abilities or preferences, as standard economics assumes. Moreover, preferences and cognition co-evolve with institutions. Remote historical differences in economic conditions—for example, whether a town in Italy was organized as a free-city state in the Middle Ages, rather than falling under a strong centralized power – changed the “nation’s psyche” in ways that are continuing to shape descendants of those societies today and to influence economic development (Guiso, Sapienza, and Gonzales, 2016).

The two revolutions in economics of this century investigate the consequences, respectively, of *imperfect information* and the *imperfect processing of information*.<sup>1</sup> The economics of imperfect information is now part of mainstream economics, but behavioral economics is not. A common complaint about behavioral economics is that it undermines the assumption that individuals are rational actors with fixed preferences without building a new grand model to replace the old one. Daniel Kahneman (2003, p. 1449) has responded to this complaint:

[P]sychological theories of intuitive thinking cannot match the elegance and precision of formal normative models of belief and choice, but this is just another way of saying that rational models are psychologically unrealistic. Furthermore, the alternative to simple and precise models is not chaos. Psychology offers integrative concepts and mid-level generalizations ...[that] explain ostensibly different phenomena in diverse domains.

## Realism-improving middle-range theory

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<sup>1</sup> Thus the economic historian Douglass North (1990, p. 111) noted that “[s]ocial scientists have incorporated the costliness of information in their models, but have not come to grips with the *subjective mental constructs by which individuals process information* and arrive at conclusions that shape their choices” (emphasis added).

Instead of a new grand theory, behavioral economics offers realism-improving middle-range theory. Examples are what Matthew Rabin (2013) calls “PEEMS”—portable extensions of existing models. PEEMS are a way to incorporate psychology into standard economic models. In a PEEM, a parameter that can be applied across domains incorporates a limit on rationality, for example, limited self-control, present bias, or reference-dependent preferences. PEEMs address an inconsistency that Kenneth Arrow noted over 30 years ago:

[A]n economic theorist ...toils for months to drive the optimal solution to some complex economic problem, and then blithely assumes that the agents in his model behave as if they are capable of solving the same problem. ‘We have the curious situation that scientific analysis imputes scientific behavior to its subjects’ (Thaler, 2016, p. 162).

We list a few subfields of behavioral economics, with an example of a central PEEM or middle-range theory in that field in parenthesis: *behavioral finance* (prospect theory), *behavioral macroeconomics* (present bias), *behavioral game theory* (limited strategic thinking), and *behavioral law and economics* (the availability heuristic).<sup>2</sup>

While an expressed need for mid-level generalizations is relatively new in economics, it has long propelled work in other social sciences. Robert Merton (1949), one of the great early sociological theorists, penned an essay titled “On Sociological Theories of the Middle-Range.” The essay was a reaction to the quest of a previous generation of scholars for a “total system of sociological theory,” which Merton argued offered “the same exhilarating challenge and the same small promise as those many philosophical systems which have fallen into deserved disuse” (p.453). He advocated “middle-range theory” that would firmly tether sociologists to empirical data and hypothesis testing, while still allowing for theoretical advancement. Modern-day social theorists build on this idea (e.g., Hedstrom and Swedberg, 1998; Elster, 2007; Hedstrom and Ylikoski, 2010; an argument particular to development is Deaton, 2009). The behavioral sciences are converging on a shared view of the value of middle-range theory. It does not match

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<sup>2</sup> See Kahneman and Tversky (1979), Jolls, Sunstein, and Thaler (1988), and Camerer, Ho, and Chong, 2004.

the scope and power of rational actor theory in economics, but it is necessary for understanding many behaviors and has shaped the design of effective new policy tools.

To discuss the making of *behavioral development economics*, we begin by showing how it emerged, and we use the distinction in Camerer (2005) and Hoff and Stiglitz (2016) between two strands of behavioral economics. The first strand investigates deviations from rationality. The agent is a quasi-rational actor; he does not always act on what, if he thought deliberately, he would know that he wanted. This strand emphasizes the value of simplicity of presentation and well-chosen contextual frames and default options to improve, by individuals' own standards, the quality of their decisions.

The second strand of behavioral economics is concerned with how preferences and cognition are shaped by—and thus endogenous to—past and present social and cultural environments. In this work, a cultural toolkit of concepts, categories, identities, narratives, and worldviews is what allows individuals to “locate, perceive, identify, and label” events in the world around them (Goffman 1974). Culture, preferences, and institutions are closely related (overviews from the perspective of behavioral economics are North, 1994; Fehr and Hoff, 2011; and Hoff and Stiglitz, 2016). We will provide many examples in which dysfunctional institutions and social patterns are reproduced in the ongoing cycle in which individuals and institutions mutually constitute one another. In this second strand of behavioral economics, the agent is an ‘enculturated actor.’ Short-run interventions, by changing individuals’ interpretive frames, can have durable impacts on cognition, aspirations, and behavior. Two recent studies, which are part of ongoing, long-term evaluations, suggest that the changes may reduce the intergenerational transmission of poverty (Macours and Vakis, 2017) and permit the extreme poor to ‘graduate’ out of poverty (Banerjee et al., 2015).

## Early behavioral economics



Herbert Simon was a key early contributor to behavioral economics. He was a polymath with a PhD in political science who made significant contributions to psychology, economics, sociology, philosophy, administrative theory, public administration, and computer science. Simon's abiding interest was human decision-making. His research on what he termed "bounded rationality" formed the heart of his work for nearly half a century and was the major reason he was awarded the Nobel Prize in Economics (Schwartz, 2002). At the newly formed Graduate School of Industrial Administration at Carnegie Tech (GSIA, now Carnegie-Mellon) where Simon spent most of his career, the collective vision in the 1950's was to create "a new behavioral science which was broad enough to accommodate disciplines such as sociology and social psychology, yet precise enough to reflect the rigor and technical sophistication of mathematical models" (Augier and March 2002, p.10). The group aspired to understand decision-making by linking economics to diverse fields— including organization theory, cognitive science, and sociology— and focusing on uncertainty, ambiguity, norms, routines, and learning. The model was a productive one: four members of the small cluster of faculty and doctoral students at GSIA in the 1950s and early 1960s subsequently received Nobel Prizes in economics, and 15 have been elected to the National Academy of Sciences (Augier and March 2002, p. 11).

A defining feature of Simon's work was its dual focus on (i) descriptive analyses of how people actually behave and (ii) prescriptive guidance for improving decision-making. Simon never formulated a normative alternative to neoclassical theory and did not view the rational model as a yardstick against which to compare decision-making. This helps explain why his work was often ignored by economists (Schwartz 2002; Sent 2004). Nevertheless, Simon's legacy endures in the centrality of his idea of 'bounded rationality' in behavioral economics. In addition, his notion of 'satisficing' -- a realistic alternative to 'optimizing' behavior in which individuals use selective or heuristic search processes to find a solution to their problems -- parallels an idea central to the second strand of behavioral economics in which individuals use existing categories, identities, narratives, concepts, and worldviews to interpret and solve their problems/

In 2002, Schwartz (p. 184) lamented that several of the most-cited behavioral economists at the turn of the century were building on work in psychology and experimental economics at the expense of “analyses of actual behavioral decision making” that Simon regarded as absolutely critical. He noted a *Business Week* reporter’s inability to draw micro- and macro-policy recommendations from behavioral economists in the wake of the September 11, 2001 terrorist attacks. Fifteen years later, with prominent investigations in behavioral economics investigating how poverty ‘captures the mind’ (Mullainathan and Shafir, 2013), how priming their stigmatized identity impairs the cognitive performance of low-caste schoolchildren (Hoff and Pandey, 2006, 2014), how behavioral therapy for at-risk youth to reduce reliance on automatic thinking reduces crime and high school drop-out rates (Heller et al. 2017), that critique has lost its edge. Large-scale policy experiments inform the choices of governmental and non-governmental organizations (for example, J-PAL, the White House, the World Bank), But Schwartz’s comment is a reminder that a field that produces many partial insights about behavior in lieu of a powerful, unified theory will benefit from an ability to usefully inform policy. Raj Chetty (2015) concurs, suggesting that behavioral economics should focus on improving public policy by offering new policy tools, improving predictions about the effects of policies, and generating new welfare implications.

Along with Simon, a second towering figure of ‘old’ behavioral economics was George Katona. He became interested in the psychological foundations of economic behavior as a result of experiencing hyperinflation in Germany (Angner and Lowenstein 2012). One of Katona’s major contributions was to emphasize the role of “intervening variables” – variables that intervene between stimulus and response, modifying how people actually behave. Accounting for an intervening variable helps explain why a given set of economic factors can cause divergent responses across groups or over time periods. We mention Katona for two reasons. First, his work on intervening variables provides a foundation for our later argument that past experience and exposure shape mental models are a critical missing variable in economic analysis. Second, in line with the earlier

discussion of the need for middle-range theory, Katona was an early proponent of finding a middle theoretical ground for behavioral insights that were about more than “aberrations” from the standard model yet were not as unpredictable as Keynesian “animal spirits” -- polar descriptions that he thought needlessly limited our understanding of behavior as well as of corrective policy reactions (Curtin 2017). Katona viewed context-dependent information processing as *standard* rather than *aberrational* behavior—a point we return to when we discuss the need for behavioral development economics to move beyond a paradigm in which the influences of sociocultural factors on decision-making are shoehorned into a framework that characterizes them as ‘deviations’ from rationality.

## 20<sup>th</sup> century behavioral economics: The ‘quasi-rational actor’

In 2002, the psychologist Daniel Kahneman won the Nobel Prize in Economics for work in behavioral economics. (It would have been shared with Amos Tversky if he had still been alive.) Early in his career, Kahneman studied the psychology of perception. He brought that perspective to his work with Tversky, who was a mathematical psychologist. Their joint research documented, for the first time, systematic errors of judgment that arise from the normal workings of the human mind (and not from emotion, which earlier had been thought to be the main cause of errors of judgment).<sup>3</sup> Just as we can have alternative perspectives on a visual scene that make the scene appear quite different, a choice set can nearly always be *framed* in alternative ways that lead many people to rank options in the choice set differently (Tversky and Kahneman, 1981, p. 253). Kahneman and Tversky showed that most of our thinking is based on automatic thinking—that is, on intuition, not controlled reasoning. Following Stanovich and West (2000), Kahneman (2011, p. 13) called the two kinds of cognition System 1 and System 2:

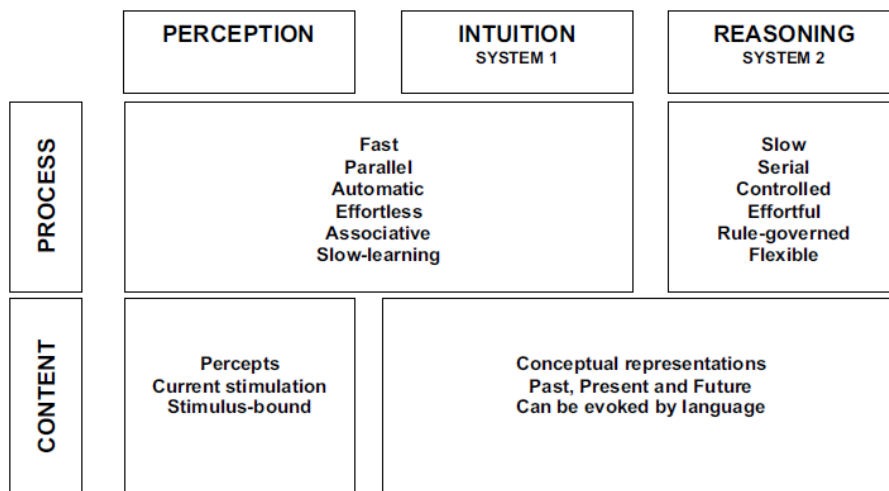
I describe mental life by the metaphor of two agents, called System 1 and System 2, which respectively produce fast and slow thinking. I speak of the features of intuitive and deliberate thought as if they were traits and dispositions of two

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<sup>3</sup> A wide-ranging assessment of the novelty of their work and its impact on economics is Heukelom (2014).

characters in your mind. In the picture that emerges from recent research, the intuitive System 1 is more influential than your experience tells you, and it is the secret author of many of the choices and judgments you make.

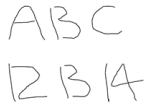
System 1, like perception, is fast, automatic, and effortless. It takes into account only information that comes easily to mind. In contrast, reasoning is slow, controlled, and effortful. Most of our decisions are guided by System 1, rather than System 2, although most people presume the opposite. Figure 1, from Kahneman’s Nobel Prize acceptance essay, summarizes three kinds of cognition: perception, intuition, and reasoning. The figure indicates that the processes of perception and intuition are similar; both are largely pattern recognition (Kahneman, 2011, p. 11). Both are ‘slow-learning’ because an individual has to see many examples of a pattern before he recognizes the pattern fast and effortlessly, just as a chess master needs thousands of hours of practice before he is able to instantly recognize many chess patterns. We will return to this later when we discuss the persistence of some social patterns, such as gender inequality, and how they are linked to particular ways of perceiving others and perceiving oneself.



**Figure 1. Three kinds of cognition: perception, intuition, and reasoning.** The first two processes have much in common: they are fast, automatic, and slow-learning.

Source: Kahneman, 2002.

Figure 2 illustrates how perception is based on pattern-recognition. The middle symbol in each row is the same, but it is perceived as a letter when framed by letters and as a number when framed by numbers.



ABC  
1234

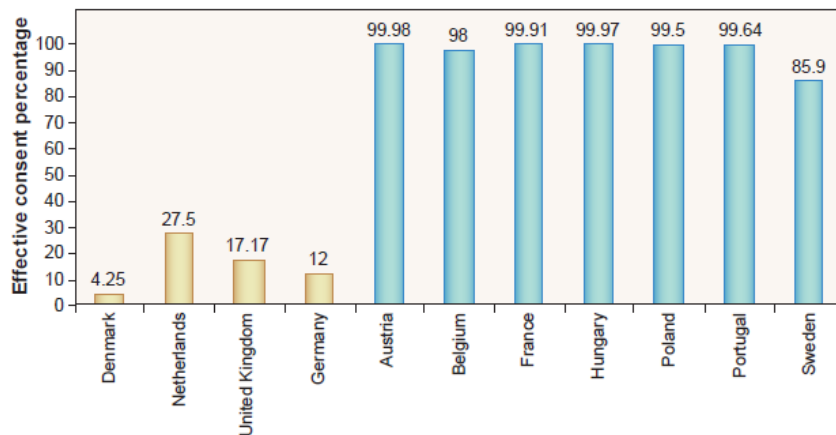
**Figure 2. Framing effects**

Source: Kahneman, 2011

In his Nobel prize acceptance essay, Kahneman (2003) reviews a large set of studies that indicate the influence of automatic thinking on decisions over highly consequential matters. Two major kinds of evidence are *default effects* and *contextual framing effects*. In a choice setting, a default is the option that will be implemented if the individual takes no action. A default effect is the consequence of changing the default. If it is very easy to indicate the one's choice is not the default option (for example, it merely requires checking a box on a form), and if the differences in payoffs from the alternative actions are large, default effects do not exist in the case of the rational actors. Kahneman cites the massive default effect revealed by Johnson et al. (1993) on the choice of automobile insurance. In both Pennsylvania and New Jersey, automobile drivers have the choice of (i) an insurance policy with an unconstrained right to sue, and (ii) a cheaper insurance policy that limits the right to sue. In Pennsylvania, the default option is (i), and take-up of this option is 79 percent. In New Jersey, the default option is (ii), which means that take-up of (i) requires an active choice. The active choice is made by only 30 percent of drivers. As a result of the difference between the default options, it's estimated that Pennsylvania drivers spend \$450 million more on insurance than New Jersey drivers.

Johnson went on to make a puzzling discovery about decisions over organ donation (Johnson and Goldstein, 2003). Figure 3 shows the rates of consent for organ donation for the 11 countries that made this information public. Four countries had very low rates of consent, and the others had very high rates of consent. For example, Germany and

Austria, who have similar cultures, had rates of 12% and 99.98%, respectively. What could explain the large difference in their choices? In standard economics, it would have to be a difference in preferences, information, or incentives. However, the countries have similar cultures; and in neither country are there payments to donors or costs of donation. Instead, the countries differed in the “fine details” of their rules (in quotes, since “fine” is from the perspective of standard economics): Some countries had an *opt-in procedure*, so that individuals must check a box to consent to be an organ donor. Others had an *opt-out procedure*, so that consent is presumed unless individuals check a box that they do not want to be an organ donor. As shown Figure 3, Germany had the opt-in rule, but Austria had the opt-out procedure. One possible explanation for the large impact of the default option is that it is taken to be a ‘correct standard’ of behavior, and there is incomplete information about what the correct standard actually is. But another possible explanation, which challenges the assumption in standard economics of pre-existing fixed preferences, is that many individuals do not have preferences over organ donation. By avoiding an active decision, individuals avoid the psychological cost of *constructing* their preferences (Lichtenstein and Slovik, 2006). Kahneman (2011, p. 348) suggests an additional reason for the power of default options: a decision that turns out to be wrong may produce greater regret if it departs from the default option than if it does not; the asymmetry favors the default option.



Effective consent rates, by country. Explicit consent (opt-in, gold) and presumed consent (opt-out, blue).

**Figure 3**

*Extensionality* is a principle of rationality; it states that different, but formally equivalent, descriptions of options do not change preferences or judgments. The principle is violated here and in many other cases. In a study in judgments in medicine, Tversky and coauthors asked doctors to rank two therapies, A and B, for the treatment of a serious illness (McNeil, Pauker, Sox, and Tversky, 1982). For half of the respondents, the outcomes were described by *mortality rates*, shown below, and almost 44 percent of the doctors preferred option B.

	A	B
Mortality rate during treatment	.10	0
Mortality rate within one year of treatment	.32	.23
Mortality rate within 5 years of treatment	.66	.78

**Table 1. Description of two options in terms of mortality rates**

For the other half of the respondents, the options were the same but the descriptions were in term of *survival rates*: { .90, .68, .34 } for A, and { 1.0, .77, .22 } for B. In this case, only 25 percent of doctors preferred B. The difference in preferences over treatments when mortality rates rather than survival rates are used to describe the options has been replicated many times with a general population, most famously in the “Asian disease” question presented to university students by Tversky and Kahneman (1981). The mid-level theory or PEEM that explains the preference reversal is *prospect theory* (1979). Under this theory, individuals are risk averse over gains but risk-loving over losses. The example is a case of *attribute framing*, which occurs when an outcome or object is described along a single dimension in one of two logically equivalent ways. For example, one frame may be positive, e.g., “survival” or “half-full,” and the other negative, “mortality” or “half-empty.” The positive frame tends to lead to risk-averse preferences, and the negative frame to risk-loving preferences.

The reason that we described the findings of McNeil *et al.* instead of the Asian disease findings, which preceded them and are better known, is that a common criticism of

findings on framing effects runs like this: “Yes, sure, the average person often acts inconsistently, but markets choose people with high skill and training in the judgments they have to make in their work. And so markets solve many of these problems.” The evidence that many medical doctors violate extensionality shows that they too are susceptible to framing effects. Market forces in medicine do not eliminate such doctors.

One’s understanding of any situation is “the result of an active, constructive process, rather than a passive reception and registering of some external reality” (Ross and Nisbett, 1991, p. 12). Akerlof (1989) gives powerful theoretical examples in which individuals have some freedom to choose what to believe and in which they interpret information in a biased way. Their biased interpretations lead to mistakes in public policy. (A topical example is U.S. public policy towards climate change.) The way options are presented and the *mental* frames that the decision-maker brings to a situation, as well as his interest in maintaining a positive self-image, influence how he processes information. Following North (1994, 2005) and Denzau and North (1994), we use the term *mental models* for these mental frames, but define them more broadly than they do. We use the term to include categories as well as identities, narratives, and worldviews. They are about what Ann Swidler (1986) calls the ‘cultural toolkit’ that individuals use to perceive, interpret, and respond emotionally to a situation.

Every real situation has infinitely many aspects, but we have finite capacity to process them. That leads us to be selective. It might also be a reason why individuals often evaluate options not in absolute terms but in relative terms, and use the most salient standard (an *anchor*), even if it is payoff-irrelevant (Ariely, 2008). A ‘framed’ situation is always an incomplete representation of the actual situation. Tversky and Kahneman (1981) argue that judgments and decisions are over framed objects and situations, not objective ones. The behavioral economist Michael Bacharach (2003, pp. 63, 71) put it aptly: “one does not just see, one *sees as*.... an empirically adequate theory of economic decision-making must model the decision-maker’s problem as she herself sees it (Rubinstein 1991).” Bacharach extends game theory backwards to include the player’s



conception of his situation, which varies not only with the contextual frame but with the mental frames he brings to it: “[T]he outcome of a given interactive problem situation can vary dramatically with the conceptual resources of the players” (1993, p. 271).

We next give an example of ethical frames in game theory. The psychologists Evans and Crumbaugh (1966) implemented two version of the Prisoner’s Dilemma. Some of the pairs, randomly chosen, had the strategies in the game described to them in a neutral way: LEFT or RIGHT for the column-chooser, and UP or DOWN for the row-chooser. But other pairs had the strategies described to them in an ethical frame: GIVE HIM 3 or GIVE ME 1 (Figure 4).

	Left	Right
Up	3,3	0,4
Down	4,0	1,1

	Give him 3	Give me 1
Give him 3	3,3	0,4
Give me 1	4,0	1,1

**Figure 4. Prisoner’s Dilemma with neutral labels of strategies (first panel) or ethically framed labels (second panel)**

The ethical frame increased the proportion of players who made the cooperative choice (the first strategy) from 48 to 63 percent. The ethical frame may have caused players to interpret the strategies as acting generously or selfishly and may have activated a social norm of generosity. Under this interpretation, the players in the ethical frame had different preferences over the strategies than the players in the neutral frame. Payoffs are not the only things that matter. Frames matter, too.

Frames, cues, and suggestions activate particular parts of the brain, which can cause the decision-maker to draw on a biased sample of ideas. Even irrelevant suggestions can change judgments and preferences. An experiment with experienced German judges

bears out this effect, termed *anchoring*. The judges read a description of a woman who had been caught shoplifting. Then they rolled dice loaded so that a roll resulted in either a 3 or a 9.

As soon as the dice came to a stop, the judges were asked whether they would sentence the woman to a term in prison greater, or lesser, in months, than the number showing on the dice. Finally, the judges were instructed to specify the exact prison sentence they would give to the shoplifter. On average, those who had rolled a 9 said they would sentence her to 8 months; those who rolled a 3 said they would sentence her to 5 months; the anchoring effect was 50% (Kahneman, 2011, pp. 125-126)

That is, the six-unit difference between the anchors caused a three-unit difference in the sentence, even though the anchor would have appeared to a judge as random.

## 20<sup>th</sup> century behavioral economic policies: Nudges

A finding that led policy makers in the U.S. government to take a great interest in behavioral economics was the discovery that a change in the default option of a Fortune 500 company's payroll system had a large impact on employees' savings decisions. Madrian and Shea (2001) found that giving employees the opt-out instead of the opt-in option for a retirement savings plan increased participation in the plan by nearly 50 percentage points. Since under-saving for retirement is a problem in the U.S., this discovery caused 56% of US firms that offered savings plans to offer opt-out, rather than opt-in, retirement savings plans to their employees, and 51% to offer opt-out savings plans with automatic escalation as one's earnings increased (Benartzi and Thaler, 2013). The automatic escalation boosted annual savings by an estimated \$7.4 billion. The effect of the adoption of opt-out plans dwarfs the effect of the U.S. tax subsidies to savings (Chetty, 2015). Moreover, the switch from opt-in to opt-out is free, whereas tax subsidies are a cost to the U.S. government.

In 2008, Richard Thaler and Cass Sunstein published the book *Nudge*, which became a kind of "spearhead of behavioral economics." It spread the ideas of Kahneman and Tversky to policymakers all over the world. Thaler and Sunstein define a *nudge* as a

policy that changes behavior without any substantial change in incentives and information: it only changes what is most salient or easiest to do without thinking at all. This kind of change is called “*choice architecture*.” By demonstrating the power of choice architecture, the book stimulated the creation of “nudge units” in Great Britain and the U.S. Their mission was to run experiments to learn how to design and implement government policies more efficiently.<sup>4</sup> One of the successes of the British nudge unit has been to increase tax collection and reduce fraud (UK Cabinet Office 2012).

Development practitioners have applied behavioral insights all over the world in both poor countries and in poor neighborhoods of rich countries. Extended discussions of the successes of these interventions are Datta and Mullainathan (2012), the *World Development Report 2015* (2015), and Demeritt and Hoff (2015). The successes launched behavioral *development* economics. To give a flavor of the interventions that improved people’s decisions, by their own standards, this section gives two examples.

### [Simplifying the ballot process](#)

There is often a high social and private return to public investments in the poor, but relatively little is known about how to induce governments to increase it (World Bank, 2004). A natural experiment in Brazil in 1998 reveals that making the process of voting simpler can greatly increase the voice of the poor, since they on average the least educated. Shortage of electronic ballot machines caused the government to create a threshold in municipality size above which electronic ballot machines were provided in 1998, and below which they were not. This makes it possible to identify the impact of the machines by comparing outcomes for municipalities just above and just below the threshold. Brazil requires all citizens to vote, but in 1998, only about 58% of individuals over 24 years of age had completed fourth grade. Fujiwara (2015) estimates that introduction of an interactive, electronic voting procedure, which gave voters immediate feedback and the opportunity to correct mistakes, effectively enfranchised 11% of the

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<sup>4</sup> The official names were the Behavioral Insights Team and the Social and Behavioral Sciences Team (SBST).

voters by reducing error-ridden ballots that would otherwise have been thrown away. As a result, political power in municipalities shifted to pro-poor parties. There was an increase of 34% in public funding by municipalities on public health care, which is used primarily by the poor. The increase in spending increased by 7 percentage points the number of pregnant women receiving regular pre-natal care, and decreased by 7% the number of low birthweight babies. Low birthweight has a large impact on the quality of life of an individual, particularly in poor countries.

### [Harnessing loss aversion to amplify the effect of incentives](#)

Poor education of disadvantaged students contributes to the intergenerational transfer of poverty. Better performance by their teachers would help them escape poverty. The rational actor responds to incentive pay. However, there is scant evidence that bonus pay to teachers for improving students' performance is effective. In a disadvantaged community near Chicago, a field experiment investigated how to amplify the effect of incentives. Fryer, Levitt, List, and Sadoff (2012) ran a field experiment that involved 150 teachers of kindergarten through 8<sup>th</sup> grade. The teachers were randomly assigned either to a control group or to one of the two main groups which (following Weissmann 2012) we will call the "winners" and the "losers." The winners worked under a traditional year-end bonus scheme, where they would make up to \$8,000 extra based on their students' performance on year-end standardized tests. The losers were given \$4,000 at the beginning of the academic year and told that if their students turned in below-average results on standardized test at year-end (as compared to a group of students matched on pre-program test performance), the teachers would have to return a portion of the bonus commensurate with how poor the scores were. The winners and losers faced identical financial incentives, but the timing, and therefore the framing, of the incentive payments differed between the two groups. For the winners, the incentive was an end-of-year bonus. For the losers, the incentive was, in part, avoiding an end-of-year loss.

Who performed better? The losers did. The improvement in the students' performance was the equivalent of an increase in a teachers' skills by one standard deviation. In contrast, for the gainers there were no statistically significant effects. Surveys of the teachers suggest that the explanation is not that the losers spent the pre-paid bonuses and so would had to incur debt to repay the bonus if their students did not do well. The impact appears to depend on psychology, not on material costs. The results are supporting evidence that individuals respond to framed options, not objective options.

Amos Tversky was once asked whether he and Kahneman were interested in artificial intelligence. He said no: "We study natural stupidity" (Lewis, 2016). The quip highlights that Kahneman and Tversky's subject was human intuition and what could go wrong with intuitive thinking.

## 21<sup>st</sup> century behavioral economics: The 'enculturated actor'

### A toolkit versus an entity view of culture

Douglass North (2005, p. 8) argued that the usual assumption in standard economics that incorrect prior beliefs will be corrected has led us astray: actors "process [information] *through mental constructs that can result in persistently inefficient paths*" (emphasis added). Psychologists, sociologist, anthropologists, and neuroscientists have independently demonstrated how deeply culture penetrates thinking; the consequences for decision-making are the subject of what we call 'strand 2' of behavioral economics. The human mind is not a *tabula rasa*, a blank slate on which experience records itself. Processes of attention, perception, cognition, emotion, motivation, and interpersonal and group relations that were once thought to be universal are now known to be culturally specific (Markus and Kitayama, 2010; many references are in Hoff and Stiglitz, 2016). "People think and feel and act in...ways that are shaped by particular patterns of historically derived meanings, practices, products and institutions" (DiMaggio and

Markus, 2010, p.348). The “fundamental processes of daily cognitive activity involve the operation of cognitive tools that are...invented and culturally transmitted” (Wilson, 2010). The measured effects include physiological responses and also economic actions that may block the formation of efficient conventions. Drawing on white, male students at the University of Michigan, Nisbett and Cohen (1996) showed that calling a student an ‘asshole’ generally triggered a surge in testosterone and cortisol among students from the U.S South but not among students from the U.S. North. The difference is interpreted as due to the much stronger culture of honor in the South than the North. This culture would lead an individual to view an insult as a threat to his honor. In an experiment in which pairs of men in North India repeatedly played a coordination game, Brooks, Hoff, and Pandey (2017) showed that miscoordination that causes one player in the pair a monetary loss relative to the other player led 53% of the ‘losers’ in high-caste pairs to take an action that could hurt their partners, whereas only 35% of ‘losers’ in low-caste pairs took this action. This difference can explain why high-caste pairs were much less likely than low-caste pairs to form the efficient convention. It may also help explain why the conventions in North Indian villages for coordination—for instance, in planting and drainage—are generally very inefficient. High-caste men are the dominant group in North India.

A greater appreciation of the effects of culture on cognition has led scholars in sociology, psychology, and anthropology to abandon the ‘entity’ view of culture, in which culture determines a stable and consistent set of preferences, in favor of a dynamic view of culture as something that happens “in action” as individuals interpret a situation using a cultural “toolkit” or “repertoire” of concepts, categories, meanings, identities, and narratives to construct a response (Swidler 1986; DiMaggio and Markus 2010). In contrast, most economists takes an entity view of culture. Behavioral economics is beginning to embrace the toolkit approach, as we discuss below.

The modern conception of culture views the brain as an information-processing device that uses cultural tools to perceive, interpret, and solve problems. Two well-known

papers, one by the sociologist Paul DiMaggio (1997) and another by the cultural psychologists Richard Nisbett and Ara Norenzayan (2002), are both entitled “Culture and Cognition.” Each emphasizes that before a problem can be solved, it must be *represented* in the mind (which means that the individual’s subjective representation of the problem can differ from reality); and the inferential procedures used to solve ‘represented’ problems *may differ dramatically across cultures*. This implies that understanding behavior requires us to know how an individual construes a situation and what cultural tools he possesses (or not) to respond to it. In the next section, we argue that the concept of ‘mental models’ helps us accomplish both these tasks.

### Cultural mental models

An influential definition of culture in cognitive sociology and cultural psychology takes a cognitive approach and, implicitly, recognizes the importance of ‘fast’ thinking in decision-making. It defines culture as (a) the set of shared *mental models* (or equivalently, *schemas*) that individuals use to attend to, perceive, process, interpret, remember, and respond emotionally to the information they encounter, and (b) the ways in which particular mental models are activated by the environment (DiMaggio, 1997; DiMaggio and Markus, 2010). A mental model can give one “the intuitive set of principles or ideas of how things work, which governs people’s predictions about the effects of change” (Camerer 2005, p.72). We have mental models for a vast number of things, for example, what a malignant cancer or an NBA player should look like (Lewis, 2017), and for whether or not infants should be spoken to and girls should go to school. Mental models are oversimplified, can be illogical, and may contain misleading representations of the world (Camerer 2005), yet they provide the cognitive underpinnings of social norms (Bicchieri and McNally, forthcoming) and institutions (North, 1990; DiMaggio, 1997). Individuals may have inconsistent mental models for a given situation. Depending on the context, Swidler (1986) finds that many couples described their marriage as based on a deep love that could not be shattered, or as one that required constant investment of time and effort.

The above definition of culture views it as an *interaction* between an individual and a situation. Since individuals may hold contradictory mental models, a change in context that change which mental model is activated can change behavior. For instance, in an experiment with a multilingual population in Uganda, the language in which a public goods game was played affected how much money players contributed to the public good (Clist and Verschoor, 2016). For the players whose local culture was associated with a low level of cooperation and in-group loyalty, contributions were more than 30 percent higher when the public goods game was played in the national language than when it was played in the local tribal language. In an experiment with bankers in Switzerland, cueing bankers' professional identities by having them answer a few on-line survey questions about their jobs increased their level of dishonesty compared to the condition in which the pre-play survey questions did not ask about their professional identities (Cohn, Fehr, and Maréchal, 2014). Recall the experiment with the Prisoner's Dilemma: when the labels for actions were changed to trigger meanings—that is, generosity or selfishness—the level of cooperation increased.

The shifts in behavior in the preceding examples may entail *unconscious adaptation*. Some unconscious adaptations individuals to adapt effortlessly to subtle changes in a situation (Goldstein and Gigerenzer, 2002). However, other shifts in behavior may be dysfunctional. In Africa, individuals from ethnic groups heavily exposed to the Atlantic slave trade are less trusting than individuals from ethnic groups whose ancestors were not so exposed, which impedes trade and the formation of good institutions (Nunn and Wantchekon, 2011). Children born into societies with institutionalized racism exhibit racist preferences by the age of five (Kinzler and Spelke, 2011), which perpetuates racist institutions. Low-caste boys in India can solve mazes just as well as high-caste boys, but if the boys' castes are publicly revealed, low-caste boys underperform high-caste boys by 23 percent in mixed-caste groups—one example among many in which labelling groups as inferior 'makes up people' to match the labels (Hoff and Pandey, 2006 and 2014; Hoff and Stiglitz, 2010). U.S. and European-born descendants of immigrants from societies



that traditionally used plough agriculture (which induced a gendered division of labor) have less equal gender roles today (Alesina, Giuliano, and Nunn, 2013).

Behavior is shaped by the social and cultural patterns and structures that we have (and importantly, that we have not) experienced or been exposed to. That experience and exposure leads individuals to construct mental models. The mental models are like lenses through which individuals see the world. How a group of people with shared mental models interprets a situation may hold the key to its subsequent development (Ross and Nisbett 1991, p. 176).

In the next draft of this paper, we will consider two very recent applications (Genicot and Ray, 2017 and Mokyr, 2017). We will discuss evidence and theory that certain groups and societies are trapped in bad economic outcomes as a result of their shared mental models, and also examples in which interventions have overcome the barriers by helping people learn how to think more deliberately (Heller et al., 2017) or develop new norms in which what they had assumed was a zero-sum game has a positive-sum resolution (Blattman, Hartman, and Blair, 2014).

The human mind has been described as a pattern-matching machine. Cultural mental models help us process information and sort the world into easier-to-read phenomena. We often map new situations onto familiar patterns. Because automatic thinking is based on pattern recognition and because individuals learn new patterns slowly, much of the architecture used for thinking is culturally-specific. It reflects experience and exposure (at least through third parties) to present and historical social patterns. This is a critical implication of *Thinking, Fast and Slow* (2011) of which economists do not take sufficient account. It is why ‘strand 1’ of behavioral economics—on the quasi-rational actor—implies ‘strand 2’—on the enculturated actor (see Figure 6).

## The co-evolution of cognition and institutions

Beyond its lack of promise for delivering a grand new theory, behavioral economics has also been criticized for having little to say about ‘big picture’ issues in social science. While we were writing the *World Development Report 2015*, commentators often pressed us to address whether the ‘small findings’ of behavioral economics add up to something important — something that could shed new light on the really big issues in development. In this section, we argue that attending to the enculturated actor and the mutual constitution of individuals and society can help us better understand big development challenges and design innovative policy interventions.

Consider a few deep institutional problems in development: the persistence in some regions of low-trust equilibria; the disparate economic performance of regions with exactly the same national policies and formal institutions; and the continued marginalization of women, minorities, and the poor in many communities. Standard economic variables have not sufficiently explained these puzzles. North (1990, p.8) outlines the beginning of a different type of answer:

Incremental change comes from the perceptions of the entrepreneurs in political and economic organizations that they could do better by altering the existing institutional frameworks at some margin. But the *perceptions crucially depend on both the information that the entrepreneurs receive and the way they perceive it*. If political and economic markets were efficient (*i.e.*, there were zero transaction costs), then the choices made would always be efficient. That is, the actors would always possess true models or if they initially possessed incorrect models, the information feedback would correct them. But that version of the rational actor model has simply led us astray. The actors frequently must act on incomplete information and *process the information that they do receive through mental constructs that can result in persistently inefficient paths*. Transaction costs in political and economic markets make for inefficient property rights, but *the imperfect subjective models of the players as they attempt to understand the complexities of the problems they confront can lead to the persistence of such property rights.*” [emphasis added]

In arguing that imperfections in mental models are transmitted to institutions, North draws attention to the close relationship between cognition and institutions. He builds on the work of the ‘old’ institutional economists, who viewed institutions in psychological terms. Wesley Mitchell (1910, p.112, cited in Angner and Lowenstein, 2012) wrote that “institutions are themselves conceived as psychological entities—habits of thought and action prevailing among the communities under observation.” This line of thinking largely disappeared from economics during the latter half of the 20<sup>th</sup> century. Scholars came to view institutions only as solutions to collective action problems.

While economic work on institutions was severing its ties with psychology and cognitive science, institutional sociology was strengthening its own such ties. The publication of Berger and Luckmann’s (1966) *The Social Construction of Reality* gave brilliant expression to a key idea in this paper: our understanding of the world is not based on objective truths but on the socially constructed frameworks provided by our socio-cultural environments to describe it.<sup>5</sup> Institutions are key sources of frameworks for understanding the world; they provide concepts, categories, symbols, scripts, and routines (mental models) that are templates for interpreting situations and constructing responses. Berger and Luckmann argue that although many institutions are born out of rational needs to reduce uncertainty and improve coordination, over time they become part of the fabric of society (naturalized, typified) and provide a ‘taken-for-reality.’ Subjective meanings become objective facticity. Thus institutions not only *reflect* individual cognition, they *shape* it.

Institutions shape what we perceive as common sense, which actually is far from common or sensible at times (Berger and Luckmann 1966; Geertz 1975 [1983]). The anthropologist Mary Douglas (1986, p. 10) describes these effects as follows:

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<sup>5</sup> Note that this is very similar to Kahneman and Tversky’s statement that we have preferences only over *framed* options. The key difference is that Berger and Luckmann take a more expansive view of framing to include socially-constructed interpretive frames.

Classifications, logical operations, and guiding metaphors are given to individuals by society. Above all, the sense of *a priori* rightness of some ideas and the nonsensicality of others are handed out as part of the social environment... Epistemological resources may be able to explain what cannot be explained by the theory of rational behavior.

A good example is the caste system in India. For many Westerners, the socially constructed notion of caste constitutes an almost unbelievable categorical scheme. Yet the categories remain deeply meaningful and a potent source of advantage and disadvantage for large classes of Indians (Hoff, 2016).

Institutionalized practices also become “infused with value beyond the technical requirements at hand” (Selznick, 1957). Institutions provide narratives encapsulating the prevailing concepts of appropriate structure and action, and the narratives carry normative obligations (DiMaggio and Powell, 1983). In some cases, institutions function as powerful myths of rationality that spur action more consistent with a ‘logic of legitimacy’ than a ‘logic of efficiency,’ with significant consequences.

In the 1970s and '80s, sociologists used this line of thinking to argue that school systems, as highly institutionalized organizations, were driven more by the need to ‘look right’ (*i.e.*, by adopting the legitimated formal structures and scripts of schooling such as a national ministry, standardized curricula, indicators regarding enrollment, etc.) than with producing learning outputs (Meyer and Rowan, 1977; an application to Botswana is Meyer et al., 1993).

It’s amazing to think that 40 years later school systems might still be more focused on the “myth and ceremony” of schooling (Meyer and Rowan 1977) than on student achievement. Yet Pritchett (2014, p. 20) notes that the institutionalized global script of schooling, with its focus on enrollments and inputs, has driven actual learning completely

off the agenda in many developing countries. He offers the example of India's information management and state report card system, which was designed to provide a 'comprehensive' and 'unified' set of statistics for education:

In the 2011/12 report card for Tamil Nadu I counted 817 distinct pieces of information reported. But of the 817 pieces of information not a single one could be construed as a direct measure of learning of any kind... In the section called 'Performance Indicators' there are 24 distinct measures including the 'per cent of schools approachable by all-weather road,' 'per cent with boundary wall,' 'per cent with ramp,' 'Pupil teacher ratio.' There was data on teachers...by gender, by caste, by age, by 'per cent trained', by formal qualification. But [a measure of] learning—of any subject, at any age, measured in any way? Not a single number.

India is far from alone in having succumbed to institutionalized scripts at the expense of technical efficiency. A primary message of the World Bank's *World Development Report 2018* is that 'schooling is not learning,' and the key policy recommendation is the astoundingly simple advice that developing countries should "start acting as if learning really matters to them" (World Bank, 2017).

The example helps us see how societies can get stuck with dysfunctional institutions that no one is trying to improve on and where few even recognize that anything is wrong. Institutional scripts shape individuals' thinking about appropriate behaviors and goals; individuals orient their actions towards these scripts, which reinforces the strength and legitimacy of the institution; and the cycle continues. There is a dynamic interaction between mind and environment – a "mutual constitution" of cultural schemata and cognition involving "mental structures selecting aspects of the environment as salient, and environments selectively reinforcing mental representations" (Markus and Kitayama, 2010; see also DiMaggio and Markus, 2010). Institutions and individuals co-evolve.

These theoretical ideas have found expression in recent econometric studies of the relationship between culture and development. We will briefly summarize results bearing on several outstanding puzzles.

*Why does Africa remain so underdeveloped?* An explanation offered by Nunn (2008), cited in the preceding section, is that the slave trade had a long-lasting impact on trust. Nunn and Wantchekon (2011) identify a negative relationship across ethnic groups in Africa between current levels of trust in others and the extent to which the ethnic group was a source of slaves in the Atlantic slave trade. One possible mechanism is that the slave trade contributed to a long-term deterioration of domestic institutions, which in turn would cause individuals to behave in less trusting ways today. A second possible mechanism is that the slave trade altered the cultural norms of groups heavily exposed to the slave trade, making modern individuals *intrinsically* less trusting. Using various strategies to disentangle the two mechanisms, Nunn and Wantchekon (2011) find that the slave trade impaired trust through both channels, but estimate that the effect via the cultural channel is twice as large as the effect via the formal institutional channel. The slave trade damaged trust because an environment of “ubiquitous uncertainty caused individuals to turn on others—including friends and family members—and to kidnap, trick, and sell each other into slavery” (p. 3221). The culture of mistrust could have been passed down across generations. The norms impede people from trying to produce better institutions, based on trust, that would facilitate economic development.

*Why do some regions remain so underdeveloped in spite of having institutions associated with development?* In *The Moral Basis of a Backward Society*, Edward Banfield (1958) argued that a culture of nepotism and self-interest and a lack of public-spirited norms kept southern Italy undeveloped compared to northern Italy. Robert Putnam (1993) built on this hypothesis. He showed that although under national law, formal institutions across regional governments were identical, performance differences among regions were correlated with differences in civic community that originated during the late Middle Ages. Around the turn of the last millennium, southern regions were brought under Norman rule where political power was based on religious authority or divine right. In contrast, in northern regions the demise of the Holy Roman Empire led to the rise of free city-states (communes). Here political power was thought to derive from the people.

Guiso, Sapienza, and Gonzales (2016) show that civic capital today—measured by the number of non-profit organizations, the existence of an organ donation organization, and the frequency of cheating on a national exam by fifth grade children in each town—increases with both the presence and degree of an area’s historical experience as a free city-state. Since the institutions associated with free city-states are long gone, the persistence cannot be due to formal institutions. The authors compare beliefs about self-efficacy (Bandura, 1977) among eighth-graders and find that children in towns that have a free city-state legacy have a higher degree of self-efficacy than their peers living in cities that do not have this legacy. A possible explanation is that participating in public life (as happened in the city-states/communes) bolstered beliefs about self-efficacy, and the beliefs were passed down across generations through education and socialization. As the authors put it, institutions and historical events can influence a “nation’s psyche.”

[ A later draft will also consider Mokyr 2017, Genicot and Ray 2017, and Heller et al 2017.]

### Moving the field beyond a reductionist quasi-rational actor

A key strength of the neoclassical model is its extreme reductionism. With a few simple principles, the model explains a massive amount of behavior. This feature helped catapult economics to the top of the social science status hierarchy. It is not surprising that behavioral economics has also been subjected to reductionist tendencies. We offer three examples from scholars at the vanguard of behavioral economics. In each example, we argue that the reductionist tendencies risk understating the depth of development challenges and may inhibit the design of policies that work.

Consider first Nunn’s definition of culture (Nunn, 2012, p. S108): “heuristics or rules of thumb that aid in decisionmaking.” This definition suggests that individuals just need new rules to make better choices. This is true for many cases. For example, giving entrepreneurs in the Dominican Republic a few simple financial rules-of-thumb improved their financial management and increased weekly revenues (Schoar and Datta 2014).

Giving people smaller plates helps them eat less because people apportion food in relation to plate size (Wansink and van Ittersum, 2006). Culture defined as rules-of-thumb works well for many 'strand one' situations, in which individuals can be 'nudged' toward an improved behavioral response.

But recall that a key principle of cultural cognition is that in many cases, before responding to a situation, we must first mentally represent it. This leaves plenty of room for situations to be mentally misrepresented. As North (1990, p.23) counselled, "we must distinguish between the real world and the actors' perception of it and reasoning about it." Ann Swidler (1986) and Glenn Loury (2015) illustrate with an example. When a youth from a slum or disadvantaged community is asked why he doesn't pursue a path to success, his answer is not "I don't want that life" but instead, "Who, me?" Social patterns and cultural values can penetrate individual thinking so deeply that the rational behavior may not even be in the individual's perceived choice set. While some slum youths might benefit from a rule of thumb that helps them complete their homework each night, many others need an entirely new mental model about what kind of person they are and what kind of person they could become. Some maladaptive behaviors stem not from the choice of a sub-optimal response to a correctly perceived situation, but instead from misconstruing the situation.

Nunn's definition of culture is a *reductionist* approach that puts culture on par with the practices we use to approximate a measure or guesstimate a solution. By contrast, Swidler defines culture as "repertoires" or "toolkits" of symbols, habits, stories, rituals, skills, and worldviews from which people assemble strategies of action – a *constructivist* approach that underscores the idea that our actions are necessarily constructed from the concepts, categories, and scripts that we've learned from our limited (and possibly marginalized) life experiences. The reductionist and constructivist approaches frame the problem of maladaptive behavior differently. The reductionist approach suggests that making a minor adjustment a rule-of-thumb would help individuals make better choices. The constructivist approach suggests that changing behavior requires individuals to



conceptualize a problem in new ways. This may mean they need help mentally representing the problem using concepts, categories, narratives, and enlarged identities they hadn't previously associated with the problem, and considering strategies of action that previously had been inconceivable. Equating culture with rules-of-thumb overlooks the fact that culture influences perception and interpretation *before* a rule is chosen. The reductionist definition may therefore contribute to improper diagnoses of behavioral challenges.

Reductionism is also occurring in frameworks used to organize behavioral insights for development. Datta and Mullainathan (2014, p. 15) recommend condensing principles in behavioral economics into a framework grounded on the notion of constraints:

To help navigate the large set of findings, we condense the behavioral literature using one simple perspective about the constraints under which people make decisions. Economists and policymakers – indeed all of us – understand constraints all too well. Resources are limited.... Yet we often do not realize that mental resources are also limited.... Without realizing, we often design programs assuming that people have unbounded cognitive capacity.... Behavioral economics can be interpreted as identifying a few more limited resources.

Datta and Mullainathan's framework encompasses four bounded mental resources: self-control, attention, cognitive capacity, and understanding. The notion of an 'understanding constraint' comes closest to capturing the idea that culture influences cognition, but we argue that this conception still downplays the nature and extent of the problem. Consider the authors' own example of diarrhea, which kills over half a million infants throughout the developed world. The main reason that the treatment for diarrhea (a sugar and salt water solution) is underused is that women see a child with diarrhea as constantly leaking fluids, so they feel the best treatment is to keep the child 'dry,' which discourages them from giving the child the rehydration solution. The authors note that "any effective solution will have to tackle the flawed mental model at its root: without doing so, information or exhortation is unlikely to have much effect" (p. 21). We agree. But is thinking of this incorrect mental model as a 'constraint of understanding' useful? In economics, removing constraints is generally straightforward: a government provides

a subsidy, or improves financial liquidity, or makes a grant. A reasonable person might conclude that removing an ‘understanding constraint’ is primarily about getting the right message to the right person at the right time. And that’s not wrong. But it’s not fully descriptive, either.

Gawande (2013) reports from a book published in Bangladesh on what it took for an effort to increase the uptake of diarrhea medicine to succeed in that country. “It attacked the problem in a way that is routinely dismissed as impractical and inefficient: by going door to door, person by person, and just talking.” A pilot project team of just over a dozen women set out to reach some 60,000 women in 600 villages:

They travelled on foot, pitched camp near each village, fanned out door to door, and stayed until they had talked to women in every hut. They worked long days, six days a week. Each night after dinner, they held a meeting to discuss what went well and what didn’t and to share ideas on how to do better...Initially, the workers taught up to twenty mothers per day. But monitors visiting the villages a few weeks later found that the quality of teaching suffered on this larger scale, so the workers were restricted to ten households a day. Then a new salary system was devised to pay each worker according to how many of the messages the mothers retained when the monitor followed up. The quality of teaching improved substantially. The field workers soon realized that having the mothers make the solution themselves was more effective than just showing them. The workers began looking for diarrhea cases when they arrived in a village, and treating them to show how effective and safe the remedy was.

Eventually, the Bangladeshi government took the program nationwide. They hired, trained, and deployed thousands of workers, region by region, and went door-to-door to show 12 million families how to save their children. “The program was stunningly successful...the knowledge became self-propagating. The program had changed the norms” (Gawande, 2013). Surveys showed that nearly 80% of recent diarrhea episodes were treated with the solution, and only 2.0% of deaths children under five years of age were attributed to diarrhea (Wilson et al., 2013). Most women now teach their children about oral rehydration, eliminating the need for repeated campaigns. But in countries that adopted an arms’-length approach to the program, it failed almost entirely. Gawande writes that “people talking to people is still how the world’s standards change.” It’s not

clear that an economic policymaker asked to remedy a “constraint of understanding” regarding diarrhea treatment would come up with anything close to what happened in Bangladesh.

We hasten to add that we are strong admirers of Nunn’s and Datta and Mullainathan’s work, and know these individuals to be deeply aware of and dedicated to the challenges of development. Our complaints could be dismissed as a quibble over language. Yet the examples are representative of a larger problem: a general trend in economics of trying to squeeze the effects of culture and human sociality on decision-making into a rational framework. We agree with Camerer (2005, p.72) that using the rational actor model as a foil for understanding limits on rationality constrains the types of insights from other behavioral sciences that are imported into economics.

Our third example is the transformation of the psychological and sociological concept of ‘identity’ that occurred as it was imported into economics. Akerlof (1983) was one of the first economists to take seriously the idea that culture affects how we conceptualize the world; his paper “Loyalty Filters” investigates how people change as a result of their experiences. However, the concept of identity introduced into economics by Akerlof and Kranton (2000, 2010) takes a more limited view of culture’s effects. Davis (2013) argues that Akerlof and Kranton “domesticate” the concept, transforming a factor that is often used to explain cooperation that is *not* in one’s self-interest into one explained in terms of utility maximization. Akerlof and Kranton assume that individuals with a given social identity have fixed preferences and process information in an unbiased way, assumptions that are inconsistent with empirical work on identity (for example, Benjamin, Choi, and Strickland, 2010; LeBoeuf, Shafir, and Bayak, 2010; Shayo and Zussman, 2011; and Cohn, Maréchal, and Fehr, 2016; recent theoretical work is Genicot and Ray, 2017). Davis (2013) laments that economic treatment of psychological, sociological, and anthropological concepts screens out key interpretations of these concepts. Identity was a missing variable in economics, and to bring it into economics was a major contribution,

but Akerlof-Kranton model focuses on the subset of effects that the rational actor model can accommodate.

As Camerer (2005, p. 71) suggests, much of “20th century behavioral economics” does not encompass a key insight of cultural psychology, cognitive sociology, cognitive anthropology, and neuroscience: *the basic machinery of human thinking is constructed through mental models, which differ across groups with different socio-cultural experiences*. The machinery was the subject of the last section. Here we stress that conceptualizing decision-making as a constructive process—constrained by the set of cognitive tools one has on hand—helps explain the degree to which culture can impede an individual’s ability to see possibilities that might be right in front of him, much less imagine ones that are not. Recognizing this can help development practitioners design new tools for changing behavior and shifting emergent ‘social equilibria’ that culturally embedded actors create and reproduce, often without any intention to do so.

Economists’ historical disinclination to grapple with the deep cultural and social effects on decision-making likely arises in part from the frames that delineate the boundaries of ‘acceptability’ within the discipline. Akerlof has noted that ideas that fall outside the typical province of economics are generally regarded as “taboo.” In discussing the difficulty of getting economists to take the role of imperfect information seriously during the first revolution in 20<sup>th</sup> century economics, Akerlof notes that “[s]omehow there are certain frameworks that people are supposed to think in and which are acceptable. If you go outside these, then people don’t know exactly how to deal with it” (Swedberg 1990, p. 65). Frames are necessary for us to process information and learn. Shared frames are necessary for us to communicate and do science. But making progress in a field sometimes requires us to recognize the limits of existing frames.

We argue that the domain of behavioral economics, and especially behavioral *development* economics, should be enlarged to take into account the finding that culture

and experience have ongoing, systematic influences on people’s perceptions, preferences, and cognition. We are not the first to recommend that economic theory be enlarged in this way. More than 30 years ago, Akerlof wrote that although the standard model is probably adequate for analyzing most types of economic behavior, a new field of “psycho-socio-anthropo-economics” is “probably applicable to the big problems, to the really big things that we don’t yet understand in economics...it is probably applicable to the question of why underdeveloped countries are so poor” (Akerlof, 1984, p.6; see also Swedberg, 1990, p. 68). Figure 5 illustrates how a second strand of behavioral economics goes beyond the quasi-rational actor, who has been the subject of most behavioral economics. Experience and exposure have persistent effects on his perceptions, cognition, and preferences.

Standard Economics	Behavioral Economics	
	<u>Strand One</u>	<u>Strand Two</u>
The rational actor	The quasi-rational actor	The enculturated actor <ul style="list-style-type: none"> <li>• <u>Endogenous</u> preferences</li> <li>• <u>Endogenous</u> cognition</li> <li>• <u>Endogenous</u> perceptions</li> </ul>
Guided by <b>incentives</b>	Also guided by <b>context in the moment of decision (primes, frames)</b>	& also guided by <b>experience &amp; exposure that create mental models</b> , e.g. <ul style="list-style-type: none"> <li>• Prototypes</li> <li>• Narratives</li> <li>• Concepts</li> <li>• Identities</li> </ul>

**Figure 5. Standard economics and two strands of behavioral economics**

Source: Hoff and Stiglitz, 2016

## 21<sup>st</sup> century behavioral economic policies: Experience and exposure that influence mental models<sup>6</sup>

### Exposure to new social patterns

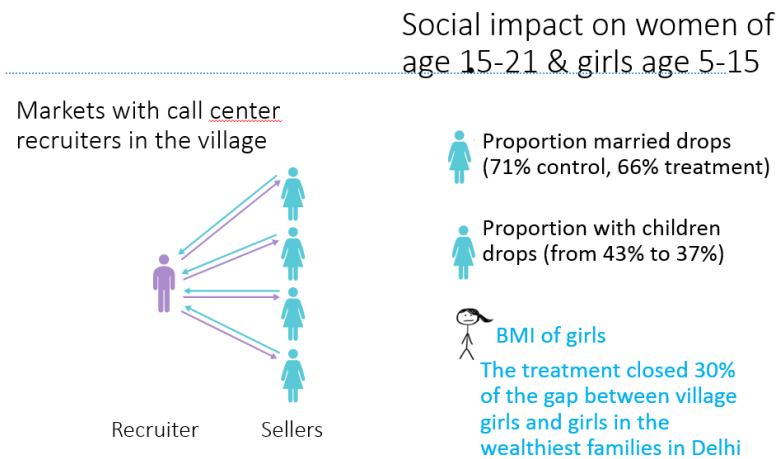
Exposure to new social patterns—even fictitious ones—can change individuals’ preferences, as the impact of soap operas on fertility rates in Brazil shows (La Ferrara et al., 2012). A company in Brazil (Globo) deliberately crafted soap operas with characters who had small families. TV emissions of the soap opera became available to municipalities in Brazil in different years, and the timing is treated as a random variable that permits identification of the impact of exposure to the soap operas. After the first year that a municipality gained access to the TV soap operas, fertility declined. The decline was greatest for respondents close in age to at least one leading female character in a soap opera. Many families named their children after characters in the soap operas. For women of age 35–44, the decrease was 11% of mean fertility.

Next consider the effect of exposure to a new social pattern in actual labor markets. Jensen (2012) gives evidence that the number of women in a given village with call center jobs affects aspirations and the autonomy of females. Jensen implemented a randomized controlled trial in 160 villages about 100 km from New Delhi. This was beyond the usual area in which recruiters travelled to recruit villagers for call center jobs. The villages had no members of any household who worked in call center jobs. Jensen hired eight call center recruiters and sent them to 80 randomly chosen villages in his sample. One day per year, for three years, one information session was held. The

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<sup>6</sup> In the next draft, we intend to shorten the write-up of the two interventions described here and include some short descriptions of a few others studies, possibly including: Beaman et al (2009, 2012) on how political reservations for women reduced males’ prejudice against female leaders as well as the gender gap in parental expectations for their children; Heller et al. (2017) on a cognitive behavioral program that reduced crime among at-risk male youth in Chicago; Rao (2017) on how a policy requiring private schools to accept a quota of poor children increases generosity and reduces prejudice among wealthy peers; Ghosal et al. (2013) on an intervention to increase the self-belief of sex workers; and Paluck (2009) on how a radio soap opera shifted perceptions of social norms around prejudice and violence in Rwanda.

recruiters also provided three years of placement support to women by phone. On average, there were 11 job matches per village over the three years. The proportion of young women with call center jobs increased from 0 to 5.6 percentage points. (Only young women obtained call center jobs since only 8 percent of the village women age 36-50 had high school degrees, the required level of education for a call center job.) Figure 6 summarizes the impact on early marriage, early bearing of children, and body mass index (BMI) of daughters. By all three measures, the autonomy and life prospects of females improved. It is possibly, but unlikely, that the effects were due solely to the increased earning potential of women. It is possible that exposure to women in good jobs changed individuals' mental representations of females, and that the change in mental representations spurred social change.



**Figure 6. Social impact on females in Indian villages of the hiring of women in call center jobs**

### Breaking poverty traps

The intergenerational transmission of poverty is a major cause of extreme poverty. Many poor parents make low levels of investment in education and nutrition in their children. As a result, the children do not have the human capital to escape poverty as adults. Many low- and middle-income countries have programs to uplift children in poor households.

One such program is conditional cash transfers (CCTs). A typical program gives regular transfers to poor parents conditional on their children achieving high attendance in schools and having regular visits to health clinics.

Does the impact of CCTs persist after the programs end? If so, what mechanisms underlie the persistence? In standard economics, the likely mechanisms would be that liquidity constraints were relaxed or that parents' information on the returns to education and health care increased. In behavioral economics, there are additional mechanisms, such as shifts in preferences and habits, as well as social influences on aspirations. Macours and Vakis (2016) find evidence that exposure to leaders who were beneficiaries of a CCT plus investment grant program have strong role model effects on other CCT beneficiaries. Exposure to such leaders raises beneficiaries' aspirations for their children and sustains the impact of programs on school attendance two years after the CCT ends. Longer-term follow-up studies will be conducted in the future.

The second question addressed in this section is whether a high-cost multifaceted program that targets the poorest individuals in a community enables them to 'graduate' out of poverty and is financially feasible. Banerjee et al. (2015) find that in five of the six countries that implemented such a program, the estimated benefits 18 months after the program ended were higher than its cost. Banerjee et al. (2016) find that the impacts on most indicators, including consumption, food security, and lower stress, actually increased seven years after the programs ended. "This suggests that the promise of the program to have unlocked a 'poverty trap' seem realized, at least in this context," the authors conclude.

#### Sustaining impacts of a one-year conditional cash transfer

Nicaragua implemented in 2006 a one-year pilot CCT program to 3,000 poor households. The mothers who benefitted from this program had on average education only three years



of education. The program allocated to more than 90% of the households in treatment communities a CCT conditional on children's primary school attendance and regular health center visits. Over the course of a year, the CCT provided 18% of average annual household income. A random one-third of the households received, in addition, a \$200 lump-sum grant to invest in a non-agricultural business. The administrators of the program formed groups in the treatment villages, each with about 10 beneficiary women, to meet regularly to talk about the program's objectives of more education, more health clinic visits, and better nutrition for the children. Each group was led by a woman who lived close to members of the group and who before the groups were formed had volunteered to be a leader (a *promotora*). Interviews showed that the *promotoras* took ownership of the messages and objectives of the program and often organized with their group to collectively buy food and other products for their children. This made the women very aware of investment by others, "with plenty of stories about children in the village going to school well-fed, with new clothes and material" (p. 8). Since the investment grants were randomly allocated to *promotoras* and other women with leadership positions (health coordinators and teachers) in the treatment communities, the exposure of CCT beneficiary households to leaders with that package was random. Some beneficiaries lived close to several leaders that got the CCT plus lump-sum grant, while others did not have any leaders with the lump-sum grant who lived near them.

The *promotoras* and other women leaders had more education and higher returns from the lump-sum investment grant than did non-leaders, and their investments in the education and nutrition of their children were higher than those of other CCT beneficiaries. Thus leaders with the investment grant were success models that others could aspire to. The results bear this out. Exposure to such leaders was crucial to sustaining the CCT's impact on children's education and nutrition beyond the term of the CCT. The higher the share of leaders with the CCT plus investment grant who lived near a household, the lower the children's absenteeism from school and the greater the household's investment in protein and fruit and vegetables to feed to the children. Average expenditures on schooling increased by 49% when all the leaders in one's

assembly received the CCT plus investment grant, and school absenteeism declined by 21%. The impacts two years after the end of the program are similar or larger than those while the intervention was in place. In contrast, the impact on nutrition (or, respectively, investment in education) was statistically insignificant if less than 33% (respectively, 75%) of leaders near where one lived received the CCT plus investment grant. Neither the CCT nor the CCT plus investment grant has positive impacts two years out in the case of beneficiaries that were not exposed to any leaders with the CCT plus investment grant.

A strong test of the impact of the intervention is the change in treatment towards children born after the end of the CCT. For these children the effects are similar: the impact on investment in nutrition and stimulation are strong if the mother was exposed to leaders with the CCT plus investment grant.

Through what mechanism does the impact occur? It might be that the leaders with the CCT plus investment grant share resources with nearby households or employ them in the new businesses. Thus the mechanisms could depend on material resources. But there is evidence of non-material changes. Survey results show that the non-leader women's expectations for their children changed. Expectations of their children obtaining professional or skilled salaried jobs were increased by almost 50% (compared to the low level in the control group) by having one more leader with the CCT plus investment grant in one's neighborhood. "[T]he results point to a permanent shift in investment behavior among families exposed to successful leaders," Macours and Vakis conclude (p. 18). The results might be interpreted as a shift in culture—in mental models and in the environment that activates them.

A multi-faceted anti-poverty program that appears to ‘graduate’ the extreme poor from poverty

In six countries (Ethiopia, Ghana, Honduras, India, Pakistan, and Peru), a multifaceted program was provided to over 10,000 individuals in extreme poverty. Beneficiaries chose from a list a productive asset (most beneficiaries in India chose a cow). For the next 18 months, the program gave training and support for the cow or other asset the beneficiary had chosen, life skills coaching, weekly cash consumption support, and access to savings accounts and health information and services. These benefits, plus regular interactions between the providers and the beneficiaries during this 18-month period, were designed to complement each other and thereby help them start productive self-employment activities. After 18 months, the program ended. The providers had no further contact with the beneficiaries.

The beneficiaries were a random sample of half of the households identified as the poorest of the poor in a participatory, wealth-ranking process that occurred in a meeting in each village from which participants were drawn. Eighteen months after the end of a program, the impact of the program on consumption, household assets, and food security had declined little or not at all; in five of the six countries, the estimated benefits exceeded the costs (Banerjee et al., 2015). In one of the six countries, the Indian state of West Bengal, an impact after seven years has been largely completed (Banerjee et al., 2016). The control group in West Bengal was entirely untouched by the program for seven years, which makes it possible to unambiguously assess the impact of the program. This section focuses on the seven-year impact in West Bengal. The evaluation finds persistent and often growing impacts over time:

Seven years after the assets were first distributed, beneficiaries’ consumption is \$16—or 26%—higher than the consumption of non-beneficiaries (the short-term effect was 6.5 dollars—or 13%)...[F]ood security is higher, households have more assets, individuals work longer hours, [and] are happier and healthier...[Since the effects almost always grow over time, the suggestion is] that the program may have put beneficiary households on a different trajectory...[T]he program also positively affects the probability that no child skips a meal, as well

as the probability that no one in the household went without food...Remarkably, [almost 6 years after the program stopped], the amount deposited in saving accounts is more than double that in the control group [almost \$18 compared to less than \$14. (pp. 1, 3, 4)

These results are conservative because they are based on intent to treat, not on the impact of the actual participants in the program. (The difference is important, since only 56% of selected households agreed to receive the treatment.) The results are striking also because average household consumption in the control group was growing in this period.

The program sought to increase consumption and food security in the long term by providing beneficiaries with income-generating assets and increased access to savings accounts. Participants were encouraged (or mandated [*check* ]) to make at least a very small regular contribution to savings accounts. Attention is especially scarce for the poor and they have particularly high stress (Mani et al., 2013; Mullainathan and Shafir, 2013; Haushofer and Fehr, 2014). This research finds that stress leads people to make worse decisions, which lower their earnings. Individuals in the treatment group, compared to the control group, were less likely to report that they had experienced a prolonged period of worry or emotional distress. The main drivers of increased income from the program in West Bengal were generated by livestock—a steady income source. But this was not the only income source that increased. Households invested part of the gains realized from the livestock business in non-farm activities.

Banerjee et al. (2016) conclude that almost six years after beneficiaries stopped their interactions with the program, they were richer, happier, and healthier. “Our next step is to ask, how did that happen?” (p. 6). The evidence on the effects of scarcity on attention, cited above, and on the effect of shocks in agriculture on the physiological levels of stress of farmers (Haushofer and Fehr), suggest that when individuals escape the disruptions of extreme income insecurity, they can form new aspirations and perhaps new habits and new preferences. It is possible that standard economic mechanisms explain all the results

of the ‘graduation’ program in West Bengal. However, findings from the studies linking stress to poor decision-making, and linking poverty to social exclusion, suggest that psychological and social factors complement the material effects of increases in economic resources.

## Conclusion

The rapidly growing number of findings of behavioral interventions that effectively promote economic development has launched the subfield of *behavioral development economics*. Courses devoted to behavioral development economics are now taught at a small number of major universities as part of the PhD program in economics. The central questions of development economics have not changed: Why are some societies so poor? How can policy end poverty? But behavioral development economics enlarges the scope of policy tools. “Nudges” can change how people think in the moment of decision. A change in the default option for savings, or the use of a labelled box to store savings, can change how individuals think in the moment when they are deciding how much to save or spend or share (Dupas and Robinson, 2013).

Individuals’ limited cognitive capacity and their deeply rooted social nature lead them to use mental models to process information. The models are learned from experiences and exposure. Individuals have many mental models, not all consistent. The context of the moment can influence which one is activated. (Some are chronically activated.) Exposure to new social patterns—fictional or real—may modify the mental models that individuals use to make decisions and thereby change their perceptions, cognition, and preferences in a persistent way. This has implications for the way that societies evolve and it may also have implications for how people escape poverty. Because social structures shape prototypes and other mental models, which shape behavior in ways that may replicate the social structures, societies can exhibit rigidities. The poor can be stuck in poverty. A society can be stuck in low trust or high corruption. A *social equilibrium* includes not only behaviors but also cultural mental models and norms.

Recent work provides new explanations for why a short-term intervention or an event in remote history can have persistent effects—for example, by changing the identities, categories, and other mental models that individuals use to process information. An intervention that gives individuals new role models, aspirations, and habits can change how they behave long after the intervention has ended.

Social and cultural variables influence cognition. They change the person, not just the his opportunity set. The ‘enculturated actor’ is a new paradigm of the decision-maker in economics that draws on work in cultural psychology, sociology, and anthropology. Taking account of the social influences on perception and cognition undermines the beliefs that competitive markets by themselves lead to Pareto efficiency, just as the economics of imperfect information did, but for different reasons.

Policies can modify mental models and thereby change behavior quite easily in some cases. However, persistent change requires that modified mental models be reinforced throughout the culture cycle in which selves and society mutually constitute one another. This requires change in the sociocultural context – in the interactions and routines people experience at home, work and school; in what institutions signify as legitimate and appropriate via their language, policies, political actions, media communications, and legal proceedings; and in the pervasive ideas in society about what is possible, good, and moral (Markus and Kitayama, 2010). Unless individuals’ ways of thinking (their categories, narratives, and identities) are also reflected in everyday social interactions and in institutional practices—in the social machinery of society—they are unlikely to be long-lasting for most people.

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