

The Making of Behavioral Development Economics

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December 2016

(Preliminary and incomplete)

Abstract

Any discipline that aims to explain human behavior needs to account for human thought processes. Yet consideration of how humans actually make decisions is very new to economics. The first strand of behavioral economics, due to Kahneman and Tversky, showed that preferences are “frame-bound”: different, but formally equivalent, frames influence preferences in systematic ways. The second strand of behavioral economics, which is central to development economics, recognizes that many frames are conceptual, rather than contextual, and are learned from experience of, or exposure to, social patterns. Past experience can shape bad trajectories because most human decision are based not on deliberate but rather on automatic thinking, which relies uncritically on mental models and is slow-learning. Dysfunctional mental models can persist. By providing experience of, or exposure to, new role models and narratives, there is evidence that interventions can change dysfunctional mental models of many people at more or less the same time and thereby promote economic development. Long-run, ongoing evaluations of short-term anti-poverty interventions give evidence that they may change endowments, aspirations, and other mental models in complementary and self-sustaining ways that break intergenerational transmission of poverty or permit adults to actually graduate from extreme poverty.

The Making of Behavioral Development Economics

Since 1970, there have been two revolutions in economics—two massive changes in perspectives of how economic outcomes are determined. The first revolution was the *economics of information*; the second was *behavioral economics*. The first revolution brought into consideration situations of asymmetric information that had earlier been banished to footnotes because it was believed that they would make little difference to the workings of competitive markets. Maintaining the assumption that individuals are rational, the economics of information shows that asymmetric information between buyers and sellers makes market equilibria inefficient and thus creates scope for policy interventions that can make everyone better off (a ground-breaking paper is Rothschild and Stiglitz, 1976). The second revolution directly challenged the assumption of rational behavior itself. By closely examining how humans actually think and behave, behavioral economics shows that our actions often violate basic principles of rationality. For instance, different, but formally equivalent, descriptions of the available options can change individuals' choices. Totally irrelevant aspects of a decision context can also influence choices. Behavioral economists have shown that people violate principles of rationality in *systematic* ways. Beyond this, a growing body of research highlights the importance of culture in shaping decision-making. Our life experiences and worldviews automatically filter what we see and influence how we interpret it, which can prevent us from noticing and using novel or unexpected types of information. From this vantage point, development progress depends on changing not only incentives, but also mindsets. In recent years, behavioral economics has shed new light on central issues in economic development, including saving, productivity, poverty traps, cooperation, dishonesty, social exclusion, fertility rates, and education. Behavioral economics has expanded the set of policies that can help people make better decisions by their own standards.

The economics of information is now part of mainstream economics, but behavioral economics is not yet mainstream (Thaler, 2015). Behavioral economics has been the target of a common complaint: while it undermines the assumption that we are rational actors with fixed preferences, it does not provide a new grand model to replace the old one. The psychologist Daniel Kahneman (2003, p. 1449) 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.

Instead of a new grand theory, behavioral economics offers many realism-improving theories that the behavioral economist Matthew Rabin (2013) calls “PEEMS”—portable extensions of existing models. PEEMS modify existing economic models with a psychological assumption, generally embedded in a parameter that can be applied across domains. PEEMS incorporate into theory a departure from rationality, such as self-control, present bias, and reference-dependent preferences. PEEMS help address an inconsistency that Kenneth Arrow noted in 1985: “an 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). Many PEEMS are widely accepted and have helped create subfields of behavioral economics. Listed here are a few subfields followed by an example, in parentheses, of a PEEM central to its development: behavioral finance (prospect theory), behavioral macroeconomics (present bias), and behavioral game theory (limited strategic thinking).¹

¹ These PEEMS are developed, respectively, in Kahneman and Tversky (1979),..., and Camerer, Ho, and Chong, 2004.

While an expressed need for ‘mid-level’ theory is relatively new in economics, it has long shaped economics’ sister discipline of sociology. In 1949, one of the great early sociological theorists penned an essay titled “On Sociological Theories of the Middle-Range” (Merton, 1949). The essay was a reaction to the previous generation’s quest for a “total system of sociological theory,” which Robert Merton argued embodied “the same exhilarating challenge and the same small promise as those many philosophical systems which have fallen into deserved disuse.” He advocated instead for “middle-range theory” that would firmly tether sociologists to empirical data and hypothesis testing. Modern-day theorists in the discipline contribute to this program by calling for close scrutiny of social mechanisms that explicate the workings of social processes across diverse domains (e.g., Hedstrom and Swedberg, 1998; Hedstrom and Ylikoski 2010). Behavioral economics and sociology have converged on a shared view on the value of middle-range theory.

This paper discusses the making of behavioral development economics. We show how it emerged, how it draws on the understanding of the causes of behavior from many non-economic fields (sociology and anthropology as well as psychology and brain science) to explain economic outcomes. It also builds on conceptualizations from non-economic disciplines of how institutions shape individuals’ beliefs, cognition, and preferences.

We first discuss a distinction between two modes of thinking corresponding roughly to intuition and reasoning. This is a distinction made famous by Kahneman and Tversky and especially by Kahneman’s 2011 book, *Thinking, Fast and Slow*. Kahneman and Tversky diagnosed and labeled systematic errors of intuition. We next describe principles of interventions that can shift individuals’ intuitive thinking in the moment of decision and thereby shift their choices. The success of such interventions in addressing intractable economic problems, such as low savings, was critical in launching both behavioral economics and behavioral *development* economics. Then we describe the long-run impact of short-run interventions on cognition, aspirations, and habits of poor individuals. We discuss short-term interventions that have promising success that may

reduce the intergenerational transmission of poverty, or that may permit adults who are the ‘poorest of the poor’ to ‘graduate’ out of poverty. Work on the coevolution of individuals and societies is the subject of the last part.

Kahneman and Tversky

In 2002, the psychologist Daniel Kahneman won the first Nobel Prize 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, and he brought that perspective to his work with Tversky, who early in his career was a mathematical psychologist. Their joint research documented, for the first time, systematic errors of intuition that arise not from emotion but from the normal workings of the human mind. Just as we can have alternative perspectives on a visual scene that make the scene appear quite different, available choices can nearly always be *framed* in alternative ways that lead many people to rank them differently (Tversky and Kahneman, 1981, p. 253). Kahneman and Tversky showed that most of our thinking is based on automatic intuition, not controlled reasoning. Following Stanovich and West (2000), Kahneman 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 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 (Kahneman 2011, p. 13).

System 1, like perception, is fast, automatic, and effortless. It takes into account only information that comes easily to mind by association. 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, which Kahneman used in his Nobel Prize acceptance lecture, summarizes three kinds of cognition and shows

that the processes of perception and System 1 are similar. Like perception, intuition is largely pattern recognition (Kahneman, 2011, p. 11). It is slow-learning because an individual has to see many examples of a pattern before he recognizes the pattern instantly, just as a chess master needs thousands of hours of practice before he comes to recognize many chess patterns instantly. We will return to this later when we talk about the persistence of some social patterns, such as gender inequality, and how they are linked to particular ways of perceiving others and perceiving oneself.

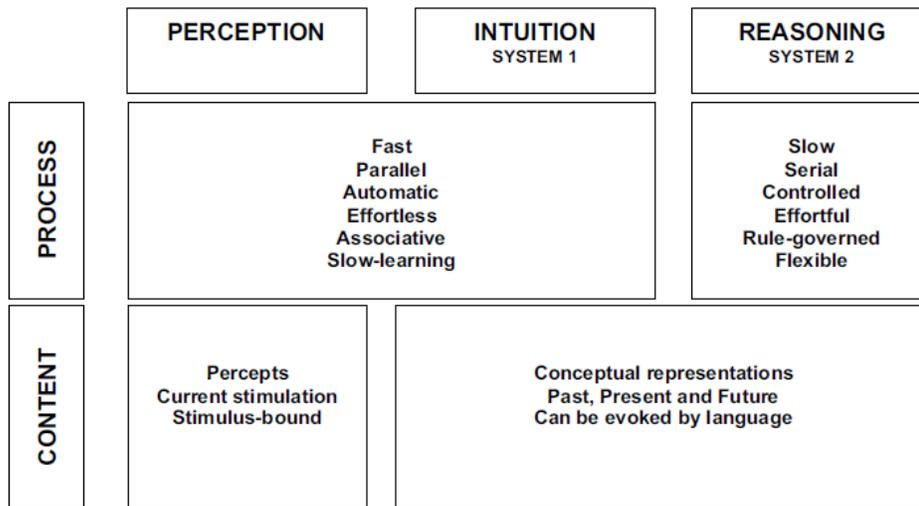


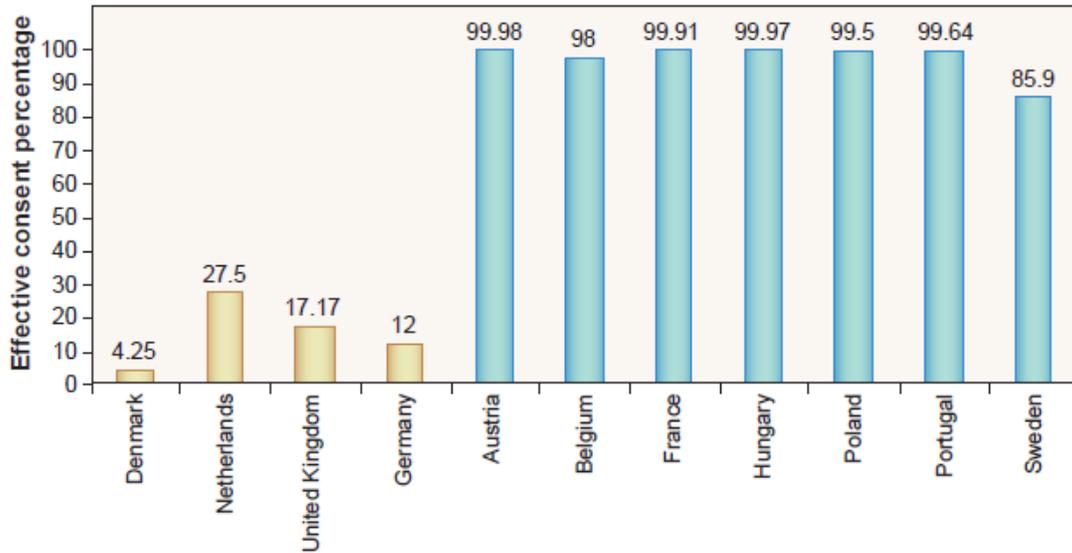
Figure 1. Kinds of cognition

Source: Kahneman, 2002.

The “map of bounded rationality” that Kahneman (2003) draws 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 which of an individual’s options is the default. If the action of taking a non-default option is every low cost (for example, it merely requires checking a box on a form), there should be no default effects on rational actors. Kahneman cites a study by Johnson et al. (1993) of a massive default effect. In Pennsylvania and New Jersey, drivers have a choice between

an insurance policy that permits a choice between an unconstrained right to sue and a cheaper policy that limits the right to sue. In Pennsylvania, the default option is the policy with unconstrained rights. Take-up of this option is 79 percent. In New Jersey, the default option is the limited right to sue. Take-up of full coverage requires an active choice and this active choice is made by only 30 percent of drivers. As a result of the difference between the default options, it is estimated that Pennsylvania drivers spend \$450 million more on insurance than New Jersey drivers. Even when the stakes are high, bounded rationality can impact decision making.

Johnson and Goldstein (2003) made a puzzling discovery about decisions over organ donation. The next figure reports information from the 11 countries that made public the rates of consent for organ donation. Four countries had very low rates of consent, and in the remaining 7 countries rates of consent were very high. Germany and Austria had rates of 12% and 99.98%, respectively. What could explain the difference? In standard economics, it would have to be a difference in preferences, prices or other costs, or information. But the countries have similar cultures. In neither country is payment made to donors or are there costs of donation. 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: individuals must check a box to consent to be an organ donor. Others had an opt-out procedure: consent is implied unless individuals check a box that they do not want to be an organ donor. As shown in the figure, Germany had the opt-in rule, but Austria had the rule of presumed consent unless the individual explicitly opted out. One possible reason 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 an important factor that violates a core assumption of standard economics is that preferences are given. Since choosing the default is a passive decision, by taking the default option, individuals avoid the psychological cost of *constructing* their preferences (Goette and Zehnder, 2011)



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

Figure 2

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 widely violated. 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:

	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

Almost 44 percent of the doctors preferred option B. 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 when mortality rates versus 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. One frame is usually 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 tends to lead to risk-loving preferences.

The reason that we describe 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, like everyone else, they are subject to framing effects. Market forces in medicine do not eliminate the doctors susceptible to these effects.

One’s understanding of any situation is the result of an active, constructive process, rather than a passive reception of some external reality (Ross and Nisbett, 1991, p. 12). Frames in the *description* of choices or in the *context* of decision-making are the main kind of frame emphasized by Kahneman and Tversky, but later work in behavioral

economics (for example, Bacharach, 2003 and Nisbett, 2003 in *The Geography of Thought*) emphasizes *conceptual* frames, which bear on the ideas that the individual brings to the interpretation of objects or situations.

Fames influence the interpretation of stimuli, even elementary ones. The perceived lengths of lines in Figure 3 are influenced by how the lines are grouped and labelled....

Figure 3 [*to be added*]

In the next figure, the middle symbol in each row is perceived as a letter when framed by letters and as number when framed by numbers.

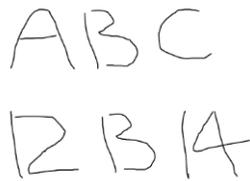


Figure 4. Framing effects

Source: Kahneman, 2011

Every real situation has infinitely many aspects. Since individuals are cognitively bounded (Bacharach 2003), they focus selectively on aspects of a situation, and the cognitive frame used influences what they select. Thus, a framed situation is always an incomplete representation of the actual situation. .

Tversky and Kahneman (1981) emphasize that all judgments and decisions are over framed objects: there is always some context, and it affects the associations of the viewer. As we discuss further later, there is, in addition, always some set of concepts that

an individual uses to interpret a stimulus. The behavioral economist Michael Bacharach (2003, pp. 63, 71) puts it aptly: “one does not just see, one *see as*...[A]n empirically adequate theory of economic decision-making must model the decision-maker’s problem as she herself sees it (Rubinstein 1991).” In this light, it makes sense that a change in the frame can reverse preferences and so violate extensionality.

“Ethical frames” are an important kind of frame. Consider the Prisoner’s Dilemma in the two forms presented by Evans and Crumbaugh (1966). In treatment 1, the payoff matrix was presented in the usual way: as shown in the figure, a column player chose between UP or DOWN, or a row player chose between LEFT or RIGHT:

	UP	DOWN
LEFT	3,3	0,4
RIGHT	4,0	1,1

Figure 5. Prisoner’s Dilemma Game with the usual labels for strategies

In treatment 2, in contrast, each subject chose between “Give him 3” and “Give me 1.” The proportion of cooperative choices rose from 48 percent in treatment 1 to 63 percent in treatment 2. The likely explanation is that treatment 2 added a new meaning to players’ choices: act generously or act selfishly. This framing of the problem may also have activated a social norm for generosity, leading players to behave more generously than they would have in the absence of the norm. We will return later to ethical frames [in reference to Habyarimana-Jack study on bus accident and the effect of posting signs in the bus].

Individuals are suggestible. Psychologists believe that many behaviors are not anchored by deep values. Instead, they are anchored by exposure to social practices. For example,

the more people whom individuals see smoking in movies, the “cooler” many people think it is to smoke, and the more they do smoke (*add cite*). “Anchoring” is like suggesting. Suggestions activate particular parts of our brain, and our thinking then draws on a biased sample of ideas. This can occur even if the suggestions have nothing at all to do with the issue being decided. An experiment with German judges who each had at least 15 years’ experience bears this out. The judges read a description of a woman who had been convicted for shoplifting. Then they rolled dice loaded so that a roll resulted in either 3 or 9. Then they ... Then the judges were asked how long a jail sentence they would they give to the woman. On average, those who had rolled 9 said a sentence of 8 months, and those who had rolled 3 said a sentence of 3 months. This framing effect is particularly striking since what triggers it—the roll of the dice —would have appeared a random event to the judges.

Tversky had an intuition about anchoring in 19__ but it was not until much later (*check: Thaler 2016*) that experiments were devised to prove the effect. Now there have been many (*cite Ariely...; Barry Schwartz...*) .

Perhaps more than anything else, one finding brought behavioral economics to the attention of economic policy makers: it was the large effect on retirement savings of the default option in a payroll system in the U.S. Madrian and Shea (2001) found that for one Fortune 500 company, automatically enrolling employees in a retirement plan, rather than requiring them to opt-in, increased participation by nearly 50 percentage points. Default options for a fixed level of savings or, alternatively, for an automatically increasing level of savings as the individuals’ annual earnings increase, have been adopted in ___ percent of US companies; Benarzi and Thaler (..) estimate that the adoption of this default option has increased savings for retirement by \$___billion in the US. The switch of the default option from no savings to a low and rising savings rate dwarfs the effect of the U.S. tax subsidies to savings (Chetty 2015). A theory to explain the power of default options discussed by Kahneman (2011, p. 348) is that a departure from the default produces regret if the decision turns out to be costly. The individual that

did not depart from the default feels much less regret when he learns that his decision was wrong. The asymmetry in the risk of regret favors the default.

In 2008, the publication of *Nudge* by the behavioral economist Richard Thaler and law professor Cass Sunstein spread the ideas of Kahneman and Tversky to policy makers all over the world. Their book has been called the “spearhead of behavioral economics.” A *nudge* is a policy that changes behavior without changing the set of choices. It does not forbid, penalize, or reward any particular choices, but instead points people toward a particular choice by changing the default option or by changing the decision context in some way that affects what is most salient or easiest to do. Thaler and Sunstein coined the phrase *choice architect* to mean someone who organizes the context (broadly defined) in which people make decisions. By demonstrating the power of choice architecture to influence the decisions people make, Kahneman and Tversky and Thaler and Sunstein stimulated the emergence of units in governments all over the world designed to improve choice architecture—in 20__ , U.K. Prime Minister Cameron formed the Behavioral Insights Team (informally called the “Nudge Unit”); in 20__ , U.S. President Obama formed the Social and Behavioral Sciences Team; and The longest standing “nudge unit” has had success in increasing tax collection and reducing fraud ... (UK Cabinet Office 2012). Development economists have applied behavioral insights in poor countries and in poor communities of rich countries. The success of many of these interventions, discussed in Datta and Mullainathan (2012) and the World Development Report 2015 (2015), helped to launch the new subfield on which this paper focuses—behavioral *development* economics.

Using framing and simplification to help the poor

The need for effective and low-cost policies to help individuals make decisions that improve their lives is greater in poor countries and communities than in rich ones. Economists have responded to this need. Saugato Datta and Sendhil Mullainathan (2012)

were the first to offer a set of a set of design principles from behavioral economics for improving the effectiveness of a development programs. The World Bank's *World Development Report 2015: Mind, Society, and Behavior*, is a book-length discussion of behavioral insights and their potential for promoting economic development. The Report provides many examples of non-traditional policies that affected development targets. Here we list some:

This is just a sketch—to be completed.

Savings for medical needs: Young children may die if they fall ill and parents cannot buy medicines. Big impact on savings of lock boxes: 66% increase in savings. (Dupas-Robinson)

Increasing pro-poor spending: Problem of how to get more public spending on the poor. (A whole WDR was devoted to this.) A natural experiment in Brazil revealed that changing the way people vote can greatly increase their voice. The simple, interactive, electronic ballot reduced error-ridden ballots that had to be thrown away. Brazil requires all citizens to vote, and electronic voting effectively enfranchised 11% of the voters. It affected primarily those with low literacy; the average education level in Brazil is 4th grade.

Shortage of electronic ballot machines led the government to create a threshold in municipality size above which electronic ballot machines were provided in 1996 (?), and below which they were not. This made it possible to show the causal impact of the machines—by comparing outcomes for municipalities just above and just below the threshold. The impact was to increase across municipalities spending on public health care, which is free and is used primarily by the poor. The number of low birthweight babies decreased by 6 %. Low birthweight is a large determinant of the quality of life of an individual, particularly in a poor country (*add cite*).

In summary, simplifying the balloting effectively enfranchised 11% of the voters in Brazil, shifting power to the relatively poor and less educated, and shifting spending towards the public health sector that the poor use, which, with better funding, reduced the number of low birth weight babies by 6%. ‘

Framing incentives as losses instead of gains

The rational actor responds to incentive pay, but there is scant evidence that bonus pay to teachers for improving students’ performance is effective. In a disadvantaged community in Chicago, Fryer, Levitt, List, and Sadoff (2012) ran a behavioral experiment in 2010-2011 academic year that involved 150 K-8th grade teachers. The teachers were randomly assigned to a control group or one of 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 at year-end on standardized tests. The losers were given \$4,000 at the beginning of the 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 pay a portion of the bonus back commensurate with how poor the scores were. An above-average performance by students would earn them additional bonus money, up to the full \$8,000. Thus both the “winners” and the “losers” faced the same financial incentives for good performance, but the framing of the incentive differed between them. The winners faced an incentive framed as a gain. The losers faced an incentive framed partly as a loss.

Who performed better? The “losers” did. In math, paying teachers a year-end bonus—a bonus framed as a gain—had no statistically significant effect. In contrast, paying teachers a bonus that they could lose if their students did not perform well improved the students’ performance by the equivalent of improving a teachers’ skills by one standard deviation. The experiment bears out the idea of Kahneman and Tversky that individuals respond to framed options, not objective options, even when the options are as simple as money.

Other “nudges”: Timing and activating norms

(incomplete)

Framing an incentive in a way that makes it more powerful is an example of what Thaler and Sunstein have called a *nudge*. Many kinds of nudges have been useful to promote economic development . Again, we give just a few examples:

Fertilizer use to increase productivity

...

Reducing traffic accidents by creating a frame of moral obligation for safety

...

Amos Tversky was once asked whether he and Kahneman were interested in artificial intelligence. He said no: “We study natural stupidity” (Michael Lewis, 2016). The amusing quotation is useful because it emphasizes that Kahneman and Tversky’s subject was human intuition and what could go wrong with intuitive thinking. This paper has given many examples in which System 1 makes us act stupidly, but (as intuition suggests) there are also many cases in which it allows us to quickly and costlessly make good inferences from patterns of incomplete information—an ability that has been called the “recognition heuristic” (Goldstein and Gigerenzer, 2002). In some cases, this is extremely useful and efficient. However, the next section demonstrates that it can also cause us to make poor decisions and fail to act in our own interest.

Bringing in cultural psychology and cognitive sociology

Moving beyond the quasi-rational actor

Standard economics treats the individual as autonomous and rational —the individual has fixed preferences, sees situations objectively, and calculates seamlessly. Behavioral economics has typically investigated the sources and consequences of deviations from these ideals: contextual frames that generate preference reversals, cognitive ‘shortcuts’ that render us error-prone, and the many ways in which we are ‘boundedly’ rational. Datta and Mullainathan (2014, p. 15) suggest a framework for organizing insights from behavioral economics for development policy:

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 (Thaler and Mullainathan, 2000). While we understand that physical resources must be carefully doled out, we are often blind to our finite mental resources. 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.

The authors list four mental resources whose limits standard economics generally ignores: self-control, attention, cognitive capacity, and understanding. The framework that they offer encompasses a great deal of work in behavioral economics, but we will argue that it does not encompass a key insight from three fields on which Kahneman and Tversky did not draw: cultural psychology, cognitive sociology, and cognitive anthropology. We will argue that *the basic machinery of human thinking is constructed through an individual's social experiences*, and we will draw out some implications for economic development.

A fundamental idea in the study of culture and cognition is that individuals not only shape society, so too are they *shaped by* society. Two well-known papers, one by the sociologist Paul DiMaggio and another by the cultural psychologist Richard Nisbett, are titled “Culture and Cognition.” All of the tools or ‘mental models’ that we use for thinking – including concepts, categories, scripts, identities, narratives, and worldviews – reflect the social patterns and social structures that we have (and importantly, that we have not) experienced. Cultural environments give culture-specific form and function to the psychological processes of attention, perception, cognition, emotion, motivation, and interpersonal and group relations (Markus and Kitayama, 2010; see also Zerubavel, 1997 and 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). Individuals from ethnic groups that were heavily exposed to the African slave trade are less trusting than those whose ancestors were not so exposed (Nunn and Wantchekon, 2011). Children born into societies with institutionalized racism exhibit racist preferences by the age of two (*cited to be added*). Low-caste boys in India can solve mazes just as well as high-caste boys, but when the boys’ castes are publicly revealed, low-caste boys underperform high-caste boys by 23 percent—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). Families whose ancestors used plough agriculture (which induced a gendered division of labor) have lower female labor force participation than families whose ancestors did not even when they face the same markets and institutions (Alesina et al., 2013).

‘Automatic thinking’ causes us not only to fall short of the rational ideal of standard economics—the focus of Kahneman and Tversky. It also means that social patterns and culture shape how we think and what our preferences are. Because automatic thinking is based on pattern recognition and is slow-learning rather than flexible (it learns patterns only after multiple exposures, the basic architecture that we use for thinking is rendered culturally specific. This is an implication of thinking, fast and slow, that is under-appreciated in economists, despite the large attention that Kahneman and Tversky’s work

has attracted. Understanding the depth to which culture penetrates our thinking is useful, because it gives development practitioners new tools for understanding and addressing individual behavior and the emergent ‘social equilibria’ that culturally embedded actors create and reproduce, often without any intention to do so.

We argue that the domain of behavioral economics, and especially behavioral *development* economics, should be enlarged to take into account the finding that people’s perceptions, preferences, and cognition systematically reflect their experiences. We are certainly not the first to recommend such an enlargement. As early as 1984, George Akerlof argued in *An Economic Theorist’s Book of Tales* that the absence of economic models that take non-economic social science seriously allows for a new field of “psycho- socio-anthropo-economics” to be opened up (Swedberg, 1990). Table 1 illustrates how a ‘second strand’ of behavioral economics goes beyond the ‘quasi-rational actor,’ who has been the subject of most behavioral economics to date, to account for an ‘enculturated actor.’

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"> • <u>Endogenous</u> preferences • <u>Endogenous</u> cognition • <u>Endogenous</u> perceptions
Guided by incentives	Also guided by context in the moment of decision (primes, frames)	& also guided by experience & exposure that create mental models, e.g. <ul style="list-style-type: none"> • Prototypes • Narratives • Concepts • Identities

Table 2. Standard economics and two strands of behavioral economics

Source: Hoff and Stiglitz, 2016

Cultural mental models

In cognitive sociology and cultural psychology, an influential definition of culture is the set of shared mental models (or equivalently, *schemas*) that individuals use to perceive, process, interpret, remember, and respond emotionally to the information they encounter, and the ways in which particular mental models are primed by the environment (DiMaggio, 1997; DiMaggio and Markus, 2010). Mental models provide cognitive underpinnings of social norms (Bicchieri and McNally, forthcoming). The human mind is a pattern-matching machine. Culture helps us process information and sort the world into easier-to-read phenomena; we often map new situations onto familiar patterns.

Individuals have many mental models, and some are inconsistent. Thus shifts in context that activate different mental models shift behavior. For instance, in an experiment with a multilingual population in Uganda, the language in which a public goods game was played affected subjects' level of contributions to the public good (Clist and Verschoor, 2016). For the players whose culture was associated with a relatively low level of cooperation and a marked absence of 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 their local tribal language. In an experiment in Swiss banks, cueing bankers' professional identities increased the level of dishonesty (Cohn, Fehr, and Maréchal, 2015). Recall the experiment with the Prisoner's Dilemma, described above: when the labels for actions were changed to trigger meanings—generosity or selfishness—the level of cooperation increased. All these shifts in behavior may be examples of *unconscious adaptation*.

The fact that a society's existing categories, concepts, practices, and norms shape the behavior of individuals in that society has important implications for understanding institutions. In standard economics, institutions are analyzed as equilibrium solutions to collective action problems. They are actively chosen by individuals who analyze what others might do and choose rational responses given their beliefs, and each player's belief

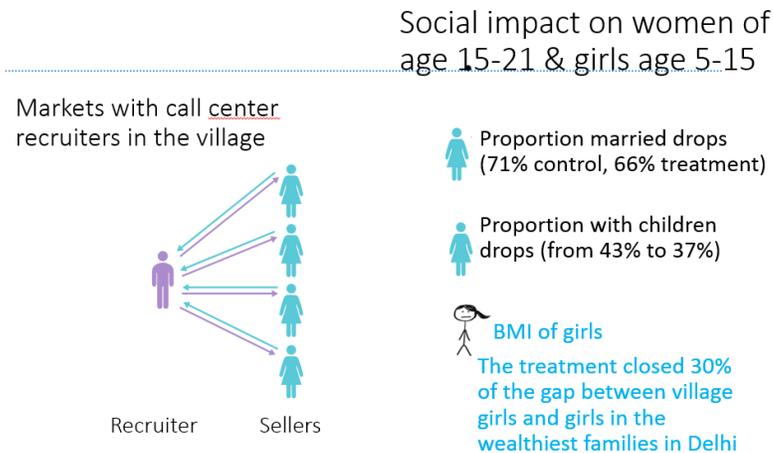
is in equilibrium consistent with what the other players actually do. Scholars interested in the *social foundations of cognition* take a different view of the formation of institutions. Institutions may not be so much rationally chosen and intended as they are the product of historical accidents and the unintended reproduction of historical patterns. Historical patterns are a key source of, and constraint on, people's identities and preferences. Some studies by behavioral economists validate these ideas.

New tools for development

The human tendency to absorb mental models from the cultural environment can be used to create social change. 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. After the first year that the 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 shown at that time. For women of age 35–44, the decrease was 11% of mean fertility. Many families named their children after characters in the soap operas. Causal identification of the effect of exposure to the soap operas was based on the arguably random timing in which different municipalities of Brazil obtained access to the TV emissions.

Next let's consider the effect of exposure to a new social pattern in actual labor markets, not in soap operas. We will argue that the number of women in a given village with call center jobs changes aspirations and how people in that village define their lives and treat their daughters. Jensen (2012) implemented a randomized controlled trial in 160 villages about 100 km from New Delhi. He hired eight call center recruiters and sent them to 80 villages. In these villages, there were no members of any household who worked in call center jobs. One day per year, for three years, one information session was held. There were also three years of continuous placement support to women, by phone. On average, there were 11 job matches per village over three years, and the proportion of young

women with call center jobs increased from 0 to 5.6 percentage points. Only young women got 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. The next figure summarizes the impact reported in Jensen.



Bringing mental models and psychological and sociological concepts such as aspirations and role models into the study of development may offer promising avenues for breaking gender inequality and also breaking deep cycles of poverty that have been resistant to traditional economic interventions, as we explore in the next section.

Breaking poverty traps

Can poverty traps be unlocked? 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 and, thus, give them neither the human capital nor wealth they would need to escape poverty as adults. Many low- and middle-income countries have programs to try 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.

The first question we address is whether the impact of CCTs can persist after the programs stop. If so, what mechanisms underlie the persistence? In standard economics, the mechanisms would be to lift existing liquidity constraints and provide information about the returns to education and health care. In behavioral economics, there are additional mechanisms, such as shifts in preferences or habits and social influences on aspirations. Macours and Vakis (2016) find evidence that exposure to leaders who were beneficiaries of a CCT + investment grant program have strong role model effects on other CCT beneficiaries. Exposure to such leaders raises other beneficiaries' aspirations for their children and sustains the impact of programs on school attendance two years after the CCT ended. Longer-term follow-up studies will be conducted in the future.

The second question we address 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 the program, the estimated benefits 18 months after the program ended were higher than its cost. In the longer term study, 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 CCT in Nicaragua

Nicaragua implemented in 2006 a one-year pilot program of CCTs to 3,000 poor households. The mothers who benefitted from this program had an average education level of 3 years. The program randomly allocated to more than 90% of the households in treatment communities a CCTs conditional on children's primary school attendance and health center visits. The CCT was 18% of average annual household income. A random

one-third of these 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 groups was led by a woman who lived closed 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 promotoras and other women with leadership positions (health coordinators and teachers) in the treatment communities were randomly allocated to the treatment with the investment grant, beneficiary households were randomly exposed to leaders with that package. Another source of variation was that some beneficiaries lived closed to several leaders that got the CCT plus lump-sum grant, while other did not have any leaders with the lump-sum grant who lived near them.

The promontoras 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 beneficiaries. Thus leaders with the investment grant were in a position to be people that others could aspire to. The results bear this out strongly. Exposure to such leaders were crucial to sustaining program impacts on children's education and nutrition after the end of the CCT. The higher the share of leaders with the CCT plus investment grant who live near the household, the less likely the children are absent from school and the more the household invests in protein and fruit and vegetables to feed the child. School expenditures increase 49% when all the leaders in one's assembly received the CCT plus investment grant, and school absence declines by 21%. The impacts 2 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 and education investment was statistically insignificant if

less than 33%, respectively, 75% of leaders near where one lived received the CCT plus investment grant treatment. 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 were exposed to leaders with the CCT plus investment grant.

These results do not indicate the mechanism through which the impact occurs. It might be that the leaders with the CCT plus investment grant share with nearby households or employ them in their new businesses. However, survey results on aspirations and expectations of non-leader women for the future of their children show that parents' expectations about their children obtaining professional jobs or skilled salary jobs were increased by almost 50% (starting from a 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.

A multi-faceted program that causes lasting progress for the very poor

In six countries (Ethiopia, Ghana, Honduras, India, Pakistan, and Peru), a multifaceted program was provided to over 10,000 participants. 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 they had chosen, life skills coaching, weekly cash consumption support for some fixed period, and typically access to savings accounts and health information or services. These benefits, plus regular

interactions between the providers and the beneficiaries for a year, were designed to complement each other to help households start a productive self-employment activity. The program helps the beneficiary for about 18 months. After that, it has no further contacts with the households.

The beneficiaries of the program were a random selection of half of the households identified as the poorest of the poor in a participatory, wealth-ranking process in a village meeting. Eighteen months after the program ended for the beneficiaries, there was little or no decline in the impact of the program on consumption, household assets, and food security. In five of the six countries, the estimated benefits of the costs were higher than the costs (Banerjee et al., 2015). For one state in one of the six countries, the Indian state of West Bengal, a long-run (seven-year) impact has been completed (Banerjee et al., 2016). The control group in West Bengal was left entirely untouched for seven years, which makes it possible to unambiguously assess the impact of the program. We will focus on the long-run 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 [per month] than the consumption of non-beneficiaries (the short-term effect was 6.5 dollars—or 13%)...[In addition,] food 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, since they are Intent to Treat estimates, not estimate based on the actual impact of participation in the program (only 56% of selected households agreed to receive the treatment). The results are also striking because this is a context where the control group's household consumption is also growing on average.

A central goal of the program was to increase consumption and food security by providing beneficiaries with income-generating assets and increasing access to savings accounts and encouraging (or mandating) at least a very small amount of regular savings [to check]. Evidence that attention is especially scarce for the poor and that they have particularly high stress has recently received a great deal of attention (Mani et al. ,___ Mullainathan and Shafir, ___ Haushofer and Fehr, ___). This research finds that stress leads people to make worse decisions that lower their earnings. The main drivers of increased income of beneficiaries in West Bengal were additional income generated by livestock—a very steady source of income. But this was not the only source of income that increased. Households invested part of the gains realized from the livestock business in non-farm activities. Not surprisingly, individuals in the treatment group, compared to the control group, were less likely to report that they had experienced a prolonged period of worry and or emotional distress.

Banerjee et al. (2016) conclude that almost six years after beneficiaries stopped their interactions with the program, there were richer, happier, and healthier, and that “[o]ur next step is to ask, how did that happen?” (p. 6) The work on the effects of scarce attention, cited above, the direct evidence of the effect of shocks in agriculture on the physiological levels of stress of farmers (Haushofer), and the evidence from Markos and Vakis for Nicaragua discussed above, all suggest that when individuals escape the disruptions of extreme income insecurity, they can form new aspirations and perhaps new habits or 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 poverty to social exclusion suggest that there are also psychological and social factors, which complement the traditional effects of increases in economic resources, that help create a path out to ‘graduate’ from extreme poverty.

To summarize, limited cognitive capacity and the deeply rooted social natures of human beings mean we use mental models to process information. We absorb these models from our experiences and exposure. We 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 change who we are: our perception, cognition, and preferences. This has implications for the way the societies evolve. Because social structures shape prototypes and other mental models, societies can exhibit rigidities. To overcome the rigidities, it may be necessary for the mental models of large numbers of individuals to change more or less simultaneously (DiMaggio, 1997). A societal equilibrium that includes not only actions in markets and politics but also cultural mental models and norms.

Bringing in anthropology

It is impossible to have contracts for everything; the willingness to cooperate altruistically is a central factor in societal success. Standard economics, in general, assumes selfish preferences and thus leaves altruistic cooperation out of account, although Arrow A key finding that brought the possibility of sustaining cooperation to attention was Fehr and Gaechter (2000). They showed that among subjects in Zurich, altruistic punishment could lead to a nearly optimal outcome of a free rider problem.....

Herrmann et al. (..) brought in culture—he undertook the Fehr and Gaechter experiment in 16 (?) societies across the world and found a strong correlation between the extent of pro-social punishment and the rule of law. Individuals in countries with low rule of law actually engaged in *anti*-social punishment: many subjects punished cooperators, presumably to retaliate against the individuals whom they believed had punished them for low levels of cooperation.

Hernich et al. (2001,...) made the first test of differences in altruism across a wide range of societies, including hunter-gatherer societies and societies in which individual households were self-sufficient in food. In the Dictator Game, an individual receives an

endowment and can share none or any amount of it with an anonymous partner....The fraction of daily caloric intake purchased in markets for the average individual in a community is the measure of market integration. The next figures shows a strong correlation between the market integration and the level of transfers in the Dictator Game ...

Conclusion

The rapidly growing number of findings of behavioral interventions that effectively promote economic development has launched *behavioral development economics* as a field.² The central questions of development economics are, Why are some societies so poor? And how can policy address that? Behavioral development economics enlarges the scope of policy tools and provides new explanations for why a short-term intervention or an historical event may have persistent effects—for example, by changing the identities, categories, and other mental models that individuals use to process information. Interventions can change how people think *in the moment of decision*; in some cases, exposure to new social patterns can have *persistent* effects. A change in the default option or the use of a labelled box to store savings, with a labelled savings objective in a passbook—can change how savers think at the moment when they are deciding how much to save or spend or share (Dupas and Robinson...). An intervention that gives individuals new role models, aspirations, and habits can change how they behave *long after the programs have ended* (Macours and Vakis, 2016).

Social and cultural variables influence cognition. Social and cultural variables change the person, not just individuals' opportunity sets. The 'enculturated actor' is a new

² The first PhD level course in behavioral development economics that we are aware of was offered at Harvard University in 2015 (*check*).

paradigm of the decision-maker in economics that draws on work in cultural psychology, sociology, and anthropology (Hoff and Stiglitz, 2016). Taking account of the social influences on preferences, perception, and cognition undermines confidence in the Pareto efficiency of market allocations, just as information economics did, but for very different reasons.

A perspective from psychology and sociology is that policies can create and/or change behavior quite easily in some cases. However, persistent change requires that changes in individual psychological tendencies be reinforced throughout the culture cycle in which selves and society mutually constitute one another. This requires changes to the sociocultural context ---changes in the interactions and routines people experience at home, work and school; changes in what institutions signify as legitimate and appropriate via their language, policies, political actions, media communications, and legal proceedings; and changes to the pervasive ideas in society about what is good, moral, and possible (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.

REFERENCES (incomplete)

- Akerlof, George, 1984. *An Economic Theorist's Book of Tales*, Cambridge University Press.
- Alesina, Alberto, Paola Giuliano and Nathan Nunn. 2013. "Gender and the Plough" *Quarterly Journal of Economics* 128 (2):469-530.
- Ariely, Daniel. 2008. *Predictably Irrational*, New York: HarperCollins.
- Ariely, Daniel. 2012. *The (Honest) Truth about Dishonesty*, New York: HarperCollins
- Bacharach, Michael (2003) Framing and cognition in economics: the bad news and the good. In: Basili M, Dimitri N, Gilboa I (eds) *Cognitive processes and economic behaviour*. Routledge, London pp 63–74
- Banerjee, Abhijit, Esther Duflo, Nathanael Goldberg, Dean Karlan, Robert Osei, William Pariente, Jeremy Shapiro, Bram Thuysbaert, Christopher Udry. 2015. A multifaceted program causes lasting progress for the very poor: Evidence from six countries. *Science*, 348 (May 14)
- Banerjee, Abhijit, Esther Duflo, Raghavendra Chattopadhyay, and Jeremy Shapiro. 2016. The long term impacts of a "graduation" program: Evidence form West Bengal. Working paper.
- Beaman, Lori, Esther Duflo, Rohini Pande, and Petia Topalova. 2012. "Female leadership raises aspirations and educational attainment for girls: A policy experiment in India. *Science* 335:582-586.
- Behavioral Insights Team. 2012. *Applying Behavioral Insights to Reduce Fraud, Error and Debt*. London: Cabinet Office
- Benartzi, Shlomo and Richard Thaler. 2013. Behavioral economics and the retirement savings crisis. *Science* 339, no. 6124:1152-53.
- Bicchieri, Cristina and Peter McNally. Forthcoming. Shrieking sirens: Schemata, scripts, and social norms: How change occurs, Forthcoming in *Social Philosophy and Policy*, 35: 1.
- Brune, Lasse, Xavier Gine, Jessica Goldberg and Dean Yang. 2011. "Commitments to save: A field experiment in rural Malawi." World Bank Policy Research Working Paper no. 5748
- Chetty, Raj. 2015. "Behavioral economics and public policy: A pragmatic perspective." *American Economic Review* 105 (5):1-33.
- Cohn, Alain, Ernst Fehr and Michael Andre Marechal. 2014. 'Business culture and dishonesty in the banking industry,' *Nature* 546-86-89
- Cookson, Richard (2000) 'Framing effects in public goods experiments', *Experimental Economics* 3:55-79

- Datta, Saugato and Mullainathan, Sendhil. 2012. "Behavioral Design: A New Approach to Development Policy." CGD Policy Paper 016. Washington DC: Center for Global Development. <http://www.cgdev.org/content/publications/detail/1426679>
- DiMaggio, Paul, 1997. "Culture and cognition." *Annual review of Sociology* 23:263-287.
- DiMaggio, Paul and Hazel Markus. 2010. "Culture and Social Psychology: Converging Perspectives" *Social Psychology Quarterly* 73 (4):347-352.
- Duflo, Esther, Michael Kremer and Jonathan Robinson. 2011. "Nudging Farmers to use Fertilizer: Evidence from Kenya." *American Economic Review* 101 (6):2350-2390.
- Dupas, Pascaline and Jonathan Robinson. 2013. "Why don't the poor save more? Evidence from health savings experiments." *American Economic Review* 103:1138-71.
- Evans, Gary and Charles Crumbaugh. 1966 'Effects of Prisoner's Dilemma format on cooperative behaviour', *Journal of Personality and Social Psychology* 3:486-488
- Fehr, Ernst and Simon Gächter
- Hedstrom, Peter, and Richard Swedberg. 1998. *Social Mechanisms: An Analytical Approach to Social Theory* (Studies in Rationality and Social Change).Cambridge University Press.
- Hedstrom, Peter and Petri Ylikoski. 2010. "Causal Mechanisms in the Social Sciences." *Annual Review of Sociology*, Vol. 36: 49-67
- Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis and Richard McElreath. 2001. "In Search of Homo Economicus: Behavioral Experiments in 15 Small-Scale Societies" *American Economic Review* 91:73-78.
- Herrmann, Benedict et al...
- Hoff, Karla and Priyanka Pandey. 2006. Discrimination, Social Identity, and Durable Inequalities, *American Economic Review*, 96 (2): 206-211.
- Hoff, Karla and Priyanka Pandey. 2014. Making Up People: The Effect of Identity on Performance in a Modernizing Society. *Journal of Development Economics*, 106:118-131.
- Hoff, Karla and Joseph E. Stiglitz. 2010. Equilibrium Fictions: A Cognitive Approach to Societal Rigidity (with Joseph E. Stiglitz), *American Economic Review, Papers & Proceedings*, 100: 141-146.
- Hoff, Karla and Joseph E. Stiglitz. 2016. "Striving for balance: Towards a theory of the social determination of preferences." *Journal of Economic Behavior and Organization*. 126:25-57.
- Jensen, Robert. 2012. "Do labor market opportunities affect young women's work and family decisions? Experimental evidence from India." *Quarterly Journal of Economics* 127 (2):753-792.
- Kahneman, Daniel and Amos Tversky. 1979. 'Prospect theory', *Econometrica* 47:263-291

- Kahneman, Daniel. 2003. 'Maps of bounded rationality: Psychology for behavioral economics.' *American Economic Review* 93 (5):1449-1475.
- Macrae, C. Neil, Galen V. Bodenhausen and Alan B. Milne. 1995. "The Dissection of Selection in Person Perception: Inhibitory Processes in Social Stereotyping," *Journal of Personality and Social Psychology*, 69:397-407.
- Markus, Hazel and Shinobu Kitayama. 2010. "Cultures and selves: a cycle of mutual constitution." *Perspectives on Psychological Science* 5 (4):420-430.
- McConnell, Allen R. and Jill M. Leibold. 2001. "Relations among the Implicit Association Test, Discriminatory Behavior, and Explicit Measure of Racial Attitudes," *Journal of Experimental Social Psychology* 37:435-42.
- McNeil, Barbara, Stephen Pauker, Harold Sox and Amos Tversky. 1982. On the elicitation of preferences for alternative therapies', *New England Journal of Medicine* 306:1259-1262
- Mehta, Judith, Chris Starmer, and Robert Sugden. 1994. 'The nature of salience: an experimental investigation of pure coordination games', *American Economic Review* 84:658-673
- Merton, Robert. 1949. "On Sociological Theories of the Middle-Range" in *Social Theory and Social Structure*. Free Press.
- Morris, Michael, Valerie Kelly, Ron Kopicki, and Derek Byerlee. 2007. Fertilizer Use in African Agriculture: Lessons Learned and Good Practice Guidelines. Washington DC: World Bank.
- Nisbett, Richard. 2003. *The geography of thought: how Asians and Westerners think differently...and why*. Free Press: New York
- Rabin, Matthew. 2013. "Incorporating limited rationality into economics." *Journal of Economic Literature* 51 (2):528-543.
- Ross, L. & Nisbett, R. 1991. *The person and the situation*.
- Rothschild, Michael and Joseph E. Stiglitz. 1976. 'Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information,' *The Quarterly Journal of Economics* 90 (4):629-649
- Royer, Heather. 2009. 'Separated at Girth: US Twin Estimates of the Effects of Birth Weight' *American Economic Journal: Applied Economics* 1 (1):49-85
- Rubinstein, Ariel. 1991. 'Comments on the interpretation of game theory', *Econometrica* 59:909-924
- Stanovich, Keith and Richard West. 2000 "Individual Differences in Reasoning: Implications for the Rationality Debate," *Behavioral and Brain Sciences* 23 (5):645-665
- Swedberg, Richard. 1990. *Economics and Sociology*. Princeton University Press.
- Thaler, Richard. 2015. *Misbehaving: The Making of Behavioral Economics*, New York: Norton.
- Thaler, Richard and Cass Sunstein. 2008. *Nudge: Improving decisions about health, wealth and*

happiness. New York: Penguin Books.

Tversky, Amos and Daniel Kahneman. 1981. 'The framing of decisions and the rationality of choice', *Science* 211:453-458

Tversky, Amos and Daniel Kahneman. 1986. 'Rational choice and the framing of decisions', *Journal of Business* 59:S521-S278

World Bank, *World Development Report 2015: Mind, Society, and Behavior* (hereafter WDR),

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