Behavioral Development Economics

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The rise of behavioral development economics

- **Historical views of development:** People were thought to be very different before and after the advent of "modernity". e.g.
  - Pre-capitalist vs. capitalist (Marx and Engels, 1848)
  - Tradition vs. rationalism (Weber and Durkheim)
  - Mechanical vs. organic solidarity
  - Modernization theory: modernization as a process of radical social change but also change in ways of thinking and seeing the world
- **Development economics:** emerged as a critical response to this view.
  - Sees farmers as essentially rational capitalists (but maybe facing market failures)
  - Rejects seemingly non-falsifiable cultural explanations (e.g. "Hindu rate of growth")

The rise of behavioral development economics (cont'd)

- The dominant view in development economics up to about the 1990s is that the poor are "poor but efficient" (Schultz, 1964)

- This view started to change during the past two decades.
  - With rise of behavioral economics, a more psychologically realistic view of human behavior has entered development economics
  - Systematic deviations from standard models in preferences, beliefs, and decision-making
  - So far, relies mostly on "universal" insights from psychology about human behavior
  - Some attention to differences in psychology across cultures or across rich and poor
  - Studies of the interaction of behavioral biases with the institutions and markets specific to developing economies.

Caveats and critiques of behavioral development economics

Behavioral development economics...

(1) Attempts to augment and improve, and not supplant, existing models.

(2) Does not deny the importance of institutions for development

(3) Is sometimes critiqued for dismissing real incentives and constraints that apparently "irrational" actions reflect (e.g. Rosenzweig and Udry (2014)) The best research in this subfield overcomes this challenge by testing specific behavioral mechanisms rather than simply identifying an apparent failure of the standard model.

Caveats and critiques of behavioral development economics (cont'd)

Behavioral development economics...

(4) Does not "blame the poor" for their poverty since it is (i) typically concerned with universal psychological factors and (ii) does not stipulate that behavioral biases are blameworthy.

(5) Critique that behavioral econ proposes paternalistic policies that restrict individual choices. There is truth to this critique. But weigh this concern against bad policy outcomes that can result from misunderstanding human behavior.

(6) Occasionally rejects robust lab-experimental results which are found to be less important in the real world (e.g. Cohen and Dupas (2010); Ashraf et al. (2010))

Topics covered (organized by behavioral concepts)

- **Non-standard preferences**
  - Time preferences (present bias)
  - Risk preferences (loss aversion, reference dependence, narrow bracketing)
  - Social preferences
- **Non-standard beliefs**
  - Naivete, projection bias
  - Non-Bayesian learning, redundancy neglect
  - Motivated reasoning
- **Non-standard decision-making**
  - Limited attention and memory
  - Mental accounting
  - Default effects

Topics covered (organized by development economics)

(1) Introduction

(2) **High rates of return without rapid growth (Euler equation puzzle)**

- (A) Euler Puzzle
- (B) Present bias
- (C) Reference-dependent preferences
- (D) Other behavioral factors (e.g. biased beliefs)

(3) Health

(4) Savings

(5) Risk and insurance

(6) Technology adoption

(7) Labor

(8) Firms

(9) Social preferences, culture, and development

(10) The psychology of poverty

High returns to capital in many contexts Banerjee and Duflo (2005)

- Borrowing at very high rates (70 to 100% annual rates and more)
  - Small-time fruit vendors in Chennai who borrow at daily rates of 5% (Karlan et al., 2018)
- High returns to small-business grants (de Mel et al., 2008)
- High returns to inventories (Kremer et al., 2013)
- Predictable large increases in prices between seasons (Burke et al., 2018)

Euler equation

- Suppose production function $F(K)$ with $F'(K) \geq 0$ and $F''(K) \leq 0$.
- Standard Euler equation links consumption growth to marginal return to capital:

$$u'(c_t) = \delta F'(K_t) u'(c_{t+1}) \tag{1}$$

- Implies (unrealistically) high consumption growth rates.
  - If log utility, $F'(K) = 50\%$ annually, and $\delta = 0.96$, then $\frac{\dot{c}}{c} = 44\%$.
  - If constant intertemporal elasticity of substitution utility with $\sigma = 2$, then $\frac{\dot{c}}{c} = 20\%$.
  - Still implies 38-fold consumption growth in 20 years.
- Need high "tax" or discount rate to resolve puzzle.
  - Implicit taxes due to corruption or redistributive pressures by from extended family members
  - Allowing for realistic values of such taxes does not resolve puzzle (Jakiela and Ozier (2015)).

Puzzle persists even with non-concave production function.

- Non-concave production functions are a feature of poverty trap models.
  - Implies multiple steady-states and sustained poverty below threshold level
- But observed initial conditions need to be consistent with model.
  - Steady state will have low rate of return.
  - Euler equation will be satisfied (FOC).
  - Individuals with high rate of return should have fast consumption growth.
- Poverty trap models also suggest a transformative effect of credit.
  - Seems counterfactual: limited uptake, limited transformation (Banerjee et al., 2015; Meager, 2019)

Stochastic income and risk aversion?

- Maybe people don't invest because investments (e.g. fertilizer) are risky? Suppose income in period t is:

$$Y_t = Y_0 + \epsilon_t + \sum_{i=1}^{n} \mu_{i,t} F_i(K_{i,t}), \tag{2}$$

  where n assets/capital goods, arbitrary pattern of correlation.

- Stochastic Euler equations:

$$u'(c_t) = \delta \mathbb{E}_t[\mu_{i,t} F_i'(K_{i,t}) u'(c_{t+1})], \quad i = 1, 2, ..., n \tag{3}$$

- Given initial capital stock, risk aversion will:
  - (i) reduce investment in assets which co-vary positively with consumption
  - (ii) increase investment in assets which co-vary negatively with consumption

But: Optimal to build buffer stock savings (Deaton, 1991; Carroll, 1997).

- If patient, risk averse, and subject to large shocks, agents want to accumulate large buffer stock savings.
  - At any one time, only a few people should have low buffer stock.
- For majority with large buffer stock, consumption should not move much with:
  - high-frequency income shocks
  - predictable income changes (e.g. seasons)
- Implies that even if returns to fertilizer highly correlated with income in season, only modestly correlated with lifetime income and thus consumption
  - Beta of fertilizer investment (correlation of return with overall consumption) will be modest, and risk aversion will only modestly reduce fertilizer investment

Model with patient consumers seems to make incorrect predictions.

- In reality:
  - Liquid buffer stocks are often modest (Deaton, 1991).
  - Consumption co-varies with income, including predictable income (Townsend, 1995).
  - Karlan et al. (2014) find that rainfall insurance increases fertilizer use.
- A model will impatient agents can create these predictions.
- Thus with either deterministic or stochastic Euler equation, matching the data requires a high effective discount rate.

High discount rates?

- Maybe $\delta = 50\%$?
- Standard exponential discounting model has only one parameter for all time horizons.
  - Euler equation typically considers short horizons (≤ 1 year).
  - In exponential discounting model, high short-run discount rate implies that distant future is discounted at extremely high rates.
- Absurd implications
  - $\delta = 0.5$ implies would not give up \$1 today for \$1 billion in 30 years.
  - No one would own land, get an education, etc.

Quasi-hyperbolic discounting (present bias)?

- Alternative hypothesis: present bias (β, δ, Laibson (1997)))
  - High discount rate between now and tomorrow
  - Low discount rate between future periods
- Can generate both high short-run discounting *and* relatively high long-run patience.

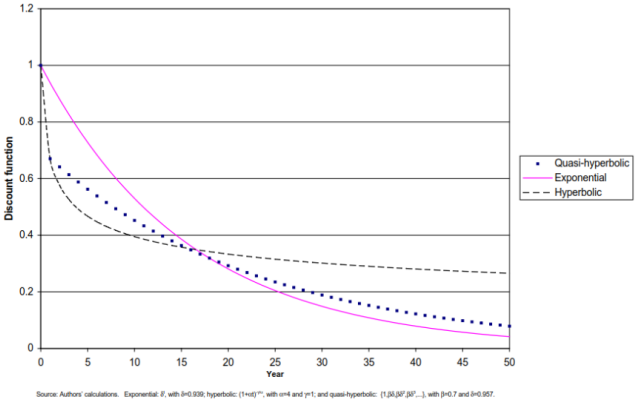

Figure: Comparison of exponential, hyperbolic, and quasi-hyperbolic discount functions [Angeletos et al., 2001]

Implications of present-biased preferences

- Predictions behavior of present-biased agents (Angeletos et al., 2001):
  - Rapidly spend down liquid assets, becoming effectively liquidity constrained
  - Build up (or hold) a stock of illiquid assets that pay off in distant future
  - Leave high rate of return investments on the table, if effectively liquidity constrained
  - Not be able to smooth consumption; consumption will co-move with income shocks, even with predictable income variation
- The sophistication of the present biased actor will determine the degree of procrastination and demand for commitment devices (O'Donoghue and Rabin, 1999, 2001).
- Implies modified Euler equation (Harris and Laibson, 2001)

Methodological aside: Measuring time preferences

- There is no broadly accepted and easily implementable approach to measuring time preferences. See Cohen et al. (2016) for excellent review.

- Common approaches include:

  (1) Providing choices between monetary payments earlier or later in time (Andersen et al., 2008; Andreoni and Sprenger, 2012). But choices over money may not reveal time preferences since MPC not equal to 1.

  (2) Providing choices between consumption events and effort (McClure et al., 2007; Augenblick et al., 2015). But consumption outside the experiment might adjust in response. These methods are also likely to be logistically more challenging.

  (3) Non-incentivized survey measures (Falk et al., 2018).

- Often trade-off between ease of implementation and mapping into conceptual framework.

Can loss aversion help explain high expected returns?

- Experimental evidence suggests that many people are loss averse (rather than risk averse).
  - See review of work on reference-dependent preferences by O'Donoghue and Rabin (1999).
- Kink in utility function around a reference point; losses felt more strongly than gains (Kahneman and Tversky, 1979).
  - Empirical estimates that people weigh losses 2-3 times as much as gains: e.g. turn down gambles with equal chance of winning $2 and losing $1.
  - With narrow bracketing, loss aversion could inhibit many investments facing farmers and small businesses.

Loss aversion and investment

- Shopkeepers in Kenya exhibiting greater loss aversion in experimental tasks maintain lower inventories (Kremer et al., 2013).
- Asset by asset; people may be hesitant to give up existing assets to invest in new assets, making asset allocations sticky, maybe reducing migration.
- Under loss aversion, loans collateralized with assets purchased under the loan will have high uptake and low default. (Jack et al. (2016); Carney et al. (2018)).
- Predicts stickiness of wealth rather than poverty trap:
  - Under poverty trap model, \$100 to shopkeeper $\rightarrow$ growth or fall back
  - Under loss aversion, potentially \$100 more indefinitely if unwilling to invest due to loss aversion

Loss aversion: reference points

- Key question in literature on reference-dependent preferences: What is the reference point?
  (1) **Status quo** (Kahneman and Tversky, 1979). Often predicts staying in place, sticky allocations. Will often look like high degree of local risk aversion.
  (2) **(Rational) expectations** (Kőszegi and Rabin, 2006, 2007). Multiple equilibria possible. If stochastic reference point (since already anticipating uncertainty in outcomes), somewhat more willing to take risks.
  (3) Other proposed specifications include aspirations, goals, past values, etc.
- Conjecture: both (1) and (2) matter (and often expectations and status quo coincide).
  - If lots of experience (e.g. planting usual crops), expectations determine reference point.
  - If new choice (e.g. try new technology) status-quo reference point.

Loss aversion: narrow bracketing

- Narrow bracketing (Tversky and Kahneman, 1981): People consider each choice in isolation, fail to integrate with other choices and background risk.
- Will choose first-order stochastically dominated choices (Rabin and Weizsäcker, 2009).
- Will often appear very locally risk averse.
  - Example: sequentially reject 100 gambles with equal chances to lose 10 or gain 12, by considering each of them in isolation (Bellemare et al., 2005; Haigh and List, 2005).
- Open questions:
  - What determines when and how people bracket?
  - Can we teach people to bracket differently?

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(1) Introduction

(2) High rates of return without rapid growth (Euler equation puzzle)

(3) **Health**

- (A) Under-investment in preventive health
- (B) Present bias
- (C) Biased beliefs
- (D) Incorrect mental models

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Under-investment in preventive health

- Widely studied case of under-investment in high-return opportunities: low investment in preventive health (e.g. vaccinations, deworming, bed nets, water treatment, hypertension)
- Recent literature established several stylized facts regarding health behavior in developing countries (Dupas, 2011; Kremer and Glennerster, 2011; Dupas and Miguel, 2017).
  (1) Low willingness to pay (WTP) for preventive health
  (2) High expenditures for treatments of acute conditions
  (3) High sensitivity of health investments to price and convenience

Demand for preventative health: low WTP and high price sensitivity

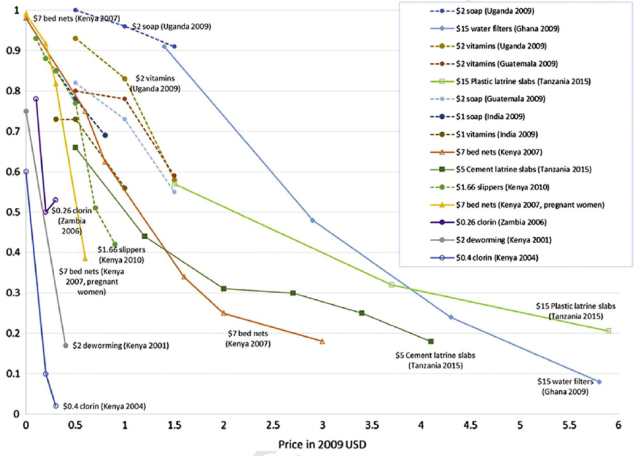

Figure: Share of individuals taking up the product as function of price (from Dupas and Miguel (2017))

High price sensitivity of demand for preventative health investments

- High price-sensitivity even in cases of substantial long-run benefits:
  - Deworming medication (Miguel and Kremer, 2004); mosquito nets (Cohen and Dupas, 2010); water treatment (Ashraf et al., 2010).
  - Example: estimated private financial benefit of deworming is $142 (Baird et al., 2016), yet $0.30 per child cost-sharing fee decreased take up 80 percent (Miguel and Kremer, 2004).
- High sensitivity also for monetary and non-monetary incentives:
  - Large impacts of small (and time-limited) incentives (lentils) for vaccination (Banerjee et al., 2010) or collecting HIV tests (Thornton, 2008)
  - Prima facie evidence against liquidity constraints (though not conclusive)
- If individuals are given more time to purchase, then lower price sensitivity, but demand still fairly sensitive to price (Dupas, 2011a).

Significant expenditures on acute conditions

- Arguably excessive treatment for some acute conditions
- Lower price sensitivity for acute care (Cohen et al., 2015)
- Suggests liquidity constraints cannot fully explain low demand for preventative health

Knife-edge balance between benefits and costs?

- One possible explanation: some people are (close to) indifferent between investing and not investing.
- Small changes in prices or incentives can alter behavior.
- Unlikely explanation given that it requires that many people in different settings happen to be (close to) exactly indifferent.

Figure: Source: Kremer and Glennerster (2011); Baird et al. (2016)

Can present bias explain under-investment in health?

- Two ways present bias may generate this under-investment:
  (1) Procrastination
  (2) Liquidity constraints due to present bias

Present bias and procrastination

- Driven by the immediate *utility costs* of the investment:
  - Examples: hassle and psychic costs of going to doctor, walking to farther-away water source, using dilute chlorine solution, changing diet, learning painful news about health status, taking medication.
  - Not financial costs unless severely liquidity constrained
- Procrastination requires both present bias and some degree of naivete.
  - Prefer to do painful task tomorrow, mis-predict that they will do it tomorrow.
- Consistent with:
  - (i) effect of time-limited incentives: e.g. Banerjee et al. (2010)
  - (ii) effect of reducing hassle costs: e.g. water dispensers (Ahuja et al., 2010)
- *Note:* Would not procrastinate on acute condition, since benefits immediate

Present bias and liquidity constraints

- Present bias can lead to liquidity constraints (Angeletos et al., 2001)
- Once liquidity-constrained:
  - High-return preventive investments may be left unexploited.
  - Monetary expenditures might now translate into (almost) immediate utility costs, since need to cut back on other consumption in order to, e.g. pay for doctor visit.
- Consistent with:
  - Evidence on effects of increased liquidity (Dupas and Robinson, 2013)
  - High impact of small discounts to fertilizer around time of harvest (Duflo et al., 2011)

Methodological aside: Measuring demand with liquidity constraints

- If people are liquidity constrained, surprising someone and offering to sell a good will not measure long-run demand.
- Endow people with money first?
  - But how much money unclear in buffer stock world
  - Can induce experimenter demand effects.
- Give people time to buy the good (Dupas, 2011a)
  - Offer coupons, to reduce demand effects
  - WTP underestimates welfare if present bias
- Allow them to pay using credit?

Present bias and commitment contracts

- Demand for commitment is "smoking gun" evidence of present bias (Ashraf et al., 2006; Giné et al., 2010; Kaur et al., 2015; Schilbach, 2019; Casaburi and Macchiavello, 2019).
- But commitment contracts only work well with high degree of sophistication
  - Naivete → low demand for commitment
  - Partial naivete → systematic failure of commitment, with plausibly negative effects on welfare if people incur the costs without the intended benefit (John, 2019; Bai et al., 2017).
- Uncertainty also implies low demand for commitment (Laibson, 2015; Amador et al., 2006).
- More promising approach may be to reduce hassle costs, provide direct time-limited incentives, ease liquidity constraints

Present bias, sophistication, and deadlines

- The effect of naivete versus sophistication about one's present bias will depend on the nature of the investment in question.

- Distinguish between 2 cases of high-return health investments:
  - (I) Case I: Investments without deadlines
    - Naive → repeated decisions to procrastinate
    - Sophisticated → may delay for a few time periods but will eventually make investment therefore no major welfare losses (O'Donoghue and Rabin, 2001).
  - (II) Case II: One-shot investments with deadlines (but negligible monetary costs)
    - Even fairly present-biased agents will make the investment since there is no way to procrastinate.

- While present bias can help explain some of the patterns in Case I, other decisions (especially in Case II) cannot be explained by present bias alone.
  - Need other (additional) reasons than present bias to explain low demand, e.g. biased beliefs

Biased beliefs

- Making good decisions regarding health requires forming accurate beliefs about numerous variables. Difficult due to uncertainty and heterogeneity across individuals (Arrow, 1963).
- Inaccurate beliefs (e.g. misperceived returns to health investments) could help explain under-investment in health. Some evidence of inaccurate beliefs regarding health in developing societies (e.g. Delavande and Kohler (2009); Godlonton et al. (2016)).
- Information interventions appear to have large impacts on health outcomes in some contexts and small to null in others Dupas (2011); Dupas and Miguel (2017).
  - Other behavioral biases might be at play in situations of low impacts of info.
  - Motivated beliefs (e.g. deriving utility from belief that one is healthy) could matter as well.
  - More work is required to understand the determinants of success in various contexts.

Incorrect causal theories or mental models

- Individuals may interpret what they observe through the wrong causal model or theory (Schwartzstein, 2014; Gagnon-Bartsch et al., 2018).
- Incorrect mental models that may be important for health outcomes in developing societies include superstitious beliefs or beliefs in magical theories of sickness and health which include witchcraft.
- Ashraf et al. (2017) illustrate this issue in the case of maternal risk in Zambia and a wide-spread belief about martial infidelity and complications during childbirth
- Parents across the world confidently hold wrong beliefs about need to re-hydrate children in response to diarrhea. Datta and Mullainathan (2014): 30 to 50 percent of women in their sample (in India) recommended *decreasing* fluid intake of infants to treat diarrhea

Evidence against importance of some ideas from psychology in the field

- Little evidence for real-world development importance of some psychological effects frequently invoked by practitioners to justify policy:
  - **Sunk-cost fallacy:** No evidence that higher prices cause greater product use Ashraf et al. (2010); Cohen and Dupas (2010).
  - **Crowd-out of intrinsic motivation:** Little evidence that extrinsic incentives crowd out intrinsic motivations in real world development contexts or that paying more leads to substantially less-motivated workers (Dal Bó et al., 2013; Ashraf et al., 2014, 2018).

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"Standard" barriers to saving

- Savings are necessary to self-insure against risks and to finance lumpy investments
- "Standard" barriers to savings include:
  - Lack of access to formal savings products
  - Prohibitive costs of opening a banking account etc.
- Dupas et al. (2018) find small effects of providing bank accounts to poor individuals, suggesting other (potentially behavioral) constraints may play a role in reducing savings

Commitment savings devices

- A key prediction of present bias: households accumulate few liquid savings over time, while building up substantial illiquid wealth. Consistent with savings patters across the world (Angeletos et al., 2001; Banerjee and Duflo, 2007; Morduch et al., 2009)
- Ashraf et al. (2006): evidence for demand for commitment devices in the domain of savings which evidences present-bias (as discussed in Section 3.2).
- A key open question surrounding the usefulness of commitment devices is the optimal trade-off between commitment and flexibility. Too stringent commitment reduces take-up and too flexible commitment does not overcome self-control problems.
- Dupas and Robinson (2013) find that a softer savings device increases spending on preventative care relative to a control group and a more stringent alternative.

Designing financial products for behavioral agents: Default effects

- Setting default choices is a cheap but often highly powerful tool in changing behavior.
- For instance, setting the default to automatic enrollment as opposed to non-enrollment has substantial impacts on individuals' retirement choices, particularly for lower-income individuals (Chetty, 2015; Chetty et al., 2014; Madrian and Shea, 2001)
- Blumenstock et al. (2018): setting opt-in defaults increase the savings of Afghanistan workers. Additionally, they argue the underlying mechanism involves present bias as well as the hassle costs of thinking through different options.

Designing financial products for behavioral agents: Attention

- Inattention can distort individuals' decision making in spheres ranging from savings to medical adherence and as such can have large costs.
- Karlan et al. (2016) study the impact of reminders on savings and consumption choices and find that reminders increase the salience of savings goals.
- Many reminder interventions in health (e.g. Pop-Eleches and et al. (2011))
- Potential negative externalities if attention is a limited resource. Need more evidence on whether reminders remain effective in the long term

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Risk sharing

- Major topic in development economics
  - Large literature on informal risk sharing
  - Literature on how risk considerations affect input choices, migration, marriage, etc.
- Warning: Aversion to small positive expected value gambles impossible to explain with expected utility theory (Rabin, 2000)

Low take-up of insurance

- Many people in developing countries exposed to very risky income streams (e.g. farming)
- Yet low take up of actuarially fair weather insurance (Cole et al., 2013).
  - Basis risk? (Clarke, 2016; Mobarak and Rosenzweig, 2012; Giné et al., 2008)
- Low take-up of health insurance (Thornton et al., 2010)
  - Administrative issues?

Potential explanations for low demand: Non-standard preferences

- Casaburi and Willis (2018): insurance meant to shift resources across states, yet most actual insurance contracts involve transferring resources over time
  - Eliminating the intertemporal component increases insurance take-up dramatically.
  - Important role for liquidity constraints, present bias
- Could loss aversion/prospect theory play a role?
  - Reference-dependent preferences increase risk aversion over moderate stakes and may lead thus cause *over*-insurance (Sydnor, 2010).
  - But premia might be seen as losses, thus curbing insurance demand (Eckles and Volkman-Wise, 2011).
  - Diminishing sensitivity away from reference point could lead to risk-seeking behavior in loss domain.

Potential explanations for low insurance demand: non-standard beliefs

- **Projection bias:** In good states of the world, agents may underestimate their marginal utility in bad states of the world (Loewenstein et al., 2003).
- **Recency effects:** Agents might place disproportionate weight on events from the recent past (Hogarth and Einhorn, 1992; Fuster et al., 2010; Chang et al., 2018; Karlan et al., 2014).
- **Motivated reasoning:** If individuals directly derive utility from beliefs about their future well-being, they may seek to maintain biased beliefs about their current health or the likely future state of the world.
- **Beliefs in higher powers:** Individuals' beliefs might deviate in more dramatic ways from standard probability assessments. Beliefs in higher powers might suppress insurance demand (Auriol et al., 2018).

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Technology adoption

- Various examples with apparently non-optimal technology choice:
  - Pineapple farming in Ghana, HYV seeds, seaweed pod size, fertilizer, contraceptives, soccer ball manufacturing techniques, layout of equipment in textile factories
- Do external analysts correctly understand payoffs?
- Do decision makers have adequate information?

Technology adoption: attention and complexity

- Inattention and wrong mental models (Hanna et al., 2014)
  - Production function is complex and attention is costly.
  - Individuals will pay attention to the dimensions they think are important.
  - If start off thinking something is not important (wrong mental model), will not pay attention and will never learn, even with data that would otherwise lead to revision of beliefs.

- Complexity of information
  - Provision of simplified information about seaweed pod size (Hanna et al., 2014), water safety (Bennear et al., 2013) or business practices (Drexler et al., 2014) may be more effective than providing full information.
  - Downsides of presenting simplified information: heterogeneity in population; external analysts might misunderstand decision problem

Technology adoption: present bias and loss aversion

- Present bias (Duflo et al., 2011)
  - If adoption requires costly experimentation, individuals might procrastinate since benefits are often much delayed.
  - Could benefit from simplification (if learning is costly).
  - Is there demand for commitment for technology adoption (training)?
  - Time-limited discounts around harvest highly effective at increasing take-up of fertilizer
- Loss aversion
  - Conjecture: relevant reference point when trying something new is the status quo. Possibility of losses with respect to the status quo will trigger loss aversion
  - Possibility of insurance or informal risk-sharing to improve outcomes?

Behavioral social learning

- Rational social learning will often lead society to right long-run choice if some can get past initial experimentation costs
- Banerjee (1992) herd behavior: model converges on optimal technology if:
  - observe output
  - observe size of investment
  - smooth loss function makes choices reveal signals
- Why might individuals not converge on optimal technology? We distinguish:
  (1) Barriers to sharing or seeking information
  (2) Barriers to correctly interpreting information

Barriers to sharing and seeking information: Social-image concerns

- The degree of communication between people is endogenous. Providing and soliciting information is a decision.
- People may be hesitant to ask for or provide information when doing so signals effort or ability (Chandrasekhar et al. (2018); Banerjee et al. (2018);
  - Implies seeding info more broadly can reduce learning
- People may not be willing to provide information to others for free if they paid for it or put in effort to get it.

Barriers to interpreting information: Redundancy neglect

- Benjamin (2018): review of biases in learning and errors in probabilistic reasoning.
  - Plenty of lab evidence but limited field evidence, e.g. on how non-Bayesian social learning influences technology adoption. Lots of opportunities!
- Theoretical work: imitating common sources without accounting for redundancy in the signals received can create confident and incorrect beliefs (Eyster and Rabin, 2014).
  - People may overweight the beliefs and actions of others.
- Empirical evidence of naive, non-Bayesian updating
  - People neglect the correlation of information structures resulting in double-counting of signals (Enke and Zimmermann, 2019).
  - Rather than using Bayes' Rule to evaluate the state of the world, people use a weighted average of neighbors' actions or opinions (Chandrasekhar et al., 2015)
- This may create information traps, making it hard to encourage adoption of technologies that go against conventional wisdom.

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Distinct features of labor markets in developing economies

- Labor markets in developing economies are different to labor markets in rich countries in three key ways that make behavioral biases potentially more important:
  - High levels of informality
  - High levels of casual labor
  - High degree of self employment

Distinct features of labor markets in developing economies (cont'd)

- Preference for work-hour flexibility might differ between developed and developing economies due to social expectations and strategic complementarities.
- View consistent with observed wage premium for formal sector jobs as well as high absence rates of employees in private sector jobs in developing countries (Kremer et al., 2005)
- Blattman and Dercon (2018) randomly assign industrial jobs in Ethiopia, finding that workers quickly quit and move to different sectors.

Labor supply and worker productivity

- One implication of informal work and self-employment is that workers might be more influenced by behavioral biases – as seen, for instance, in the high rates of inebriation during the work-day documented in Schilbach (2019).
- Self-control problems in a workplace setting are different to other domains in that, in addition to reducing the worker's welfare, they can reduce firm profits.

Factory discipline as commitment device

- Clark (1994) argues workers want factory discipline as a commitment device.
  - Much rosier view
- Kaur et al. (2015)
  - About a third of data-entry workers choose dominated commitment contract over piece rate contract
  - Offering dominated contract increases output.
  - Substantial heterogeneity; some evidence of learning
  - With asymmetric information, firms may screen out undesirable workers with factory discipline or steep incentives, reducing overall welfare
  - Justification for legislation limiting hours, etc.?

Wage rigidities

- The share of the population employed in agriculture is much higher in poor countries than in rich countries. And most farms employ outside workers for short spells using informal contracts Kaur (2019).
- Agricultural labour markets have many features that ostensibly should make them efficient: many small buyers and sellers of labor, no formal unions and little to no enforcement of minimum wages
- Despite this, even in these decentralized informal markets, nominal wage rigidities and limited dispersion of wages across workers persist. (Kaur, 2019; Breza et al., 2018b,a).

Why do wage rigidities persist?

- Wage rigidities seem persistent even in the absence of enforced minimum wages or formal institutions like unions.

- These rigidities appear to be enforced via **social sanctions**:
  - Breza et al. (2018a): nominal wage rigidities persist in part due to workers turning down public offers of jobs with wages below the prevailing market wage which workers accept when those offers are made in private.
  - Breza et al. (2018b): when coworker productivity is difficult to observe, then introducing pay inequality reduces worker output.

Wages and incentives to do good

- **Incentives in public and non-profit sectors:**
  - Some evidence of positive effects of financial incentives on public/non-profit sector worker productivity (Duflo et al., 2012; Muralidharan and Sundararaman, 2011)
  - But providing incentives to multi-tasking agents is difficult (Holmstrom and Milgrom, 1991).
  - Additionally, financial incentive programs tend to be politically unpopular and therefore are rarely scaled by governments (Finan et al., 2017)

- **Crowd-out intrinsic motivation:**
  - Lab evidence suggests extrinsic rewards can reduce intrinsic motivation (Deci, 1971; Bénabou and Tirole, 2003)
  - But very limited field evidence of substantial crowding out (Lacetera et al., 2013)

Selection of workers

- Does offering higher wages, which might attract more talent, negatively select on the pro-social motivation of workers?
- Majority of evidence suggests no negative selection. Dal Bó et al. (2013) in Mexico and Ashraf et al. (2018), in Zambia.
- Evidence consistent with underlying correction of cognitive ability and pro-sociality (Falk et al., 2018).
- However, Deserranno (2019) finds that posting job notices with a higher implied pay attracts candidates who donate less money in dictator games, and who perceive lower social benefits to the job at the time of applying.

Female labor force participation (FLFP)

- 52% of women in poor countries participate in the labour force compared to 78% of men (Duflo et al., 2012)
- Standard explanations emphasize biological reasons which, it is typically argued, engender differences in the specialization of the sexes between wage work and domestic work.
- Leaves much of the variation in FLFP unexplained, even conditional on income per capita.
- Behavioral explanations include:
  - Low self-efficacy (McKelway, 2018)
  - Social norms suppressing FLFP (Bursztyn et al., 2018a)

Topics covered

(1) Introduction
(2) High rates of return without rapid growth (Euler equation puzzle)
(3) Health
(4) Savings
(5) Risk and insurance
(6) Technology adoption
(7) Labor
(8) **Firms**
(9) Social preferences, culture, and development
(10) The psychology of poverty

Behavioral firms

- Is it reasonable to assume firms (as opposed to individuals) make choices that maximize profits? Are there reasons to believe firms in developing economies are more behavioral?
  - Here: broad definition of "behavioral": deviations from profit maximizing behavior
- Lucas (1978) span of control model and Chicago critique of behavioral economics:
  - Behavioral firms will be weeded out of the market.
  - Even if only 5% of people don't have behavioral biases, they will become managers of firms.
- Distortions in developing countries prevent efficient firms from growing and displacing less efficient ones.
- Self-employed individuals in developing countries are not just behavioral consumers, they are behavioral firms – or at least behavioral managers.

Reasons developing economy firms could be more behavioral

(1) Lower competitive pressures due to:

(i) Import restrictions

(ii) Restriction of new entrants into markets based on regulation, financial constraints, and agency problems

Reasons developing economy firms could be more behavioral (cont'd)

(2) Smaller firm sizes which limit the scope for within-firm competition that causes non-behavioral agents to rise to management:

(i) Smaller firm sizes as discussed in the previous chapter potentially due to:

- Taxation and regulation (e.g. labor regulation), predation
- Credit market issues (But profitable firms should grow over time?)
- Correlation between firm size and family structure (Ilias (2006); Bertrand et al. (2008))
- Difficulty of cooperation?

(ii) Implications

- Firms may only replace self employment when productivity advantage becomes large enough to outweigh these costs.
- Reduces ability of innovations to spread, incentives to innovate
- Reduces replacement of inefficient producers

Reasons developing economy firms could be *less* behavioral

- Higher stakes for self-employed owners of small firms
  - But: behavioral biases also important in high-stakes settings (e.g. 401k savings)
  - Also: consumption closely linked to profits and revenue, so behavioral biases (e.g. present bias, loss aversion) might have more bite
- Many seemingly-identical firms (e.g. small shops selling identical products) suggesting high levels of competition

Behavioral firms: low levels of trust

- Once we start considering behavioral biases in firm decision-making, many unexplored and potentially important areas of research arise.

- Example: Low levels of trust and missing firm growth:
  - Firms in developing countries are small and standard explanations do not completely account for just how small these firms tend to be.
  - Low levels of trust associated with smaller firm sizes Cingano and Pinotti (2012); Algan and Cahuc (2014)
  - Non-Western countries are more likely to emphasize loyalty to one's group (Haidt, 2013), which might in turn limit cooperation with out-group members.

Behavioral firms: management practices

- Improved management practices have been shown to increase firm profitability in developing country contexts (Bloom et al., 2013; Bruhn et al., 2018).
- Why are such services not demanded and offered more?
- Firms that fail to adopt these profitable practices are not necessarily weeded out of the market.

New research horizons associated with behavioral firms

- Lots of unexplored areas waiting to be explored:
  - The nature of the objective function of small (family) businesses
  - Demand forecasting/estimating by firms
  - Optimality of pricing or product choices amongst firms
  - Inventory management
  - Firm labor and capital-investment decisions
  - Technology adoption

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Trust, cooperation, and development

- Trust and cooperation important for economic and political outcomes
  - e.g. Algan and Cahuc (2014) review
- Developing countries have lower levels of trust and positive reciprocity
  - Falk et al. (2018) using global survey
- Is this a cause or consequence of development?

Trust, cooperation, and development (cont'd)

- Good reasons to think that variation in trust and reciprocity have deep historical roots
  - Enke (2018): historical tightness of kinship predicts modern-day in-group favoritism, willingness to cheat on and distrust outsiders, local rather than broader institutions.
  - Nunn and Wantchekon (2011): long-term consequences of slave trade
  - Henrich et al. (2010): evolution of fairness and punishment facilitated trust and cooperation, allowing for large-scale societies
    - E.g., moralizing gods and cooperation with strangers?
    - Market integration and fairness; community size and punishment
- But likely also in part a consequence of development, e.g. market exposure and well-functioning legal institutions might themselves increase trust.

Social image and norms

- Frontier of behavioral research on (pro)social behavior is on social image
  - Desire to conform to social norms
  - And also to impress (in socially sanctioned ways)
  - Visibility of actions can matter a great deal
- Some recent applications
  - Bursztyn et al. (2018b) on conspicuous consumption in Indonesia
  - Chandrasekhar et al. (2018, 2015); Banerjee et al. (2018) on social learning
- Much more work to be done in developing-country settings
  - Including on how norms change, e.g. gender norms

Shaping social preferences and norms

- Important to understand policies which can improve inter-group behaviors
  - Rao (2019) on integration in schools
  - Blouin and Mukand (2017) on post-conflict Rwanda
  - Lowe (2018) on different types of contact
  - Okunogbe (2018) on consequences of national service in Nigeria
  - Miguel (2004) on national identity in Tanzania
  - Role of policy and culture (Miguel and Gugerty, 2005)
- And policies which can influence certain social norms
  - La Ferrara et al. (2012); Jensen and Oster (2009): TV effects on fertility, gender attitudes
  - Bursztyn et al. (2018a) on female labor force participation in Saudi Arabia

Moral attitudes across cultures

- Psychology and behavioral econ has focused excessively on WEIRD – Western, Educated, Industrialized, Rich, Democratic – populations Henrich et al. (2010)
- Have conceptualized morality as being solely about harm and fairness
- Haidt (2013): Outside of WEIRD population, much broader conception, including not just harm and fairness, but also deeply held belief in morality of:
  - Loyalty
  - Authority / respect
  - Purity and sanctity
- Implications for economic and political behavior are ripe for exploration (recent politics!).

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Poverty and decision making

- Recent work suggests poverty may *directly* affect cognitive function and economic behaviors, thus potentially exacerbating behavioral biases and deepening poverty (Haushofer and Fehr, 2014; Schilbach et al., 2016).
- One proposed channel is via scarcity (Mullainathan and Shafir, 2013; Mani et al., 2013).
- Other channels (e.g. stress) empirically difficult to distinguish

Scarcity and cognitive function

- Mullainathan and Shafir (2013) argue that poverty impedes cognitive function through scarcity. They argue scarcity engenders an increased focus on money and as such the "bandwidth" available for other tasks is reduced.

- Mani et al. (2013): empirical evidence in support of this hypothesis
  - Lab study: inducing thoughts about money lowered the cognitive function of the poor and not the wealthy.
  - Complementary field study exploited within person variation; sugar cane farmers in India had significantly worse cognitive performance before harvest as in contrast to right after harvest.

- Potentially very important results but methodological limitations (e.g. potential learning effects in second study) and (so far) lack of successful replications
  - Carvalho et al. (2016): no differences in cognitive function and decision-making around payday among US workers

Other poverty-induced deprivations

- Poverty engenders other deprivations beyond money, including:
  - Malnutrition (Food and of the United Nations , FAO; Schofield, 2014)
  - Higher levels of stress (Haushofer and Fehr, 2014)
  - Sleep deprivation (Grandner et al., 2010; Patel et al., 2010)
  - Noise pollution and heat (Harlan et al., 2006; Dean, 2018)
  - Stigma, social exclusion (Hall et al., 2014; Ghosal et al., 2017; Chandrasekhar et al., 2018)

- Research in other fields often establish the impact of each of these deprivations on health and cognitive function (Dean et al., 2018).

- Need for more evidence on the connection to economic outcomes e.g. Schofield (2014) on effort discounting, Bessone et al. (2018) and Kaur et al. (2018) on productivity

Poverty and mental health

- Income and consumption do not correlate with mental health (Das et al., 2007), but some other measures of economic hardship (e.g. poor housing/ financial stress) do (Patel and Kleinman, 2003; Lund et al., 2010).
- Prevalence of mental health conditions in developing counties is significant, but diagnosis and treatment levels tend to be low.
  - 3,600 psychiatrists serve a population of 1.2 billion people in India!
- Simple psychotherapy interventions can be effective in treating depression in low-income contexts (Bolton et al., 2003; Patel et al., 2017) and impact economic decisons (e.g. Baranov et al. (2017))
- Many open questions: Mechanisms? How should depression be modeled? Interaction with economic opportunities?

Poverty and aspirations

- Some researchers argue that aspirations are not evenly distributed amongst rich and poor (Appadurai, 2004). Low levels of aspiration and hope can limit social mobility and contribute to a poverty traps (Ray, 2006; Dalton et al., 2015; Genicot and Ray, 2017).
- One challenge in this literature is modeling aspirations.
  - Recent work has made progress on this challenge but many open questions remain (Dalton et al., 2015; Genicot and Ray, 2017; Lybbert and Wydick, 2018).
  - Particular challenge: mapping theory into empirical objects that can be measured.
- Promising results on boosting aspirations, e.g. Bernard et al. (2014)

Poverty and religion

- Banerjee and Duflo (2007) document that the poor spend considerable time and money on religious activities.
- Such activities are thought to foster positive outcomes that are favorable for economic well-being (Freeman, 1986; Gruber, 2005; Ellison, 1991; Gruber and Hungerman, 2008)
- Need for improved understanding of the causal relationships at play between religion and these outcomes.
- Bryan et al. (2018) make progress by randomizing invitations to receive a 15-week religious education program. They find their treatment increases both religiosity and income.

Conclusion

- Ideas from behavioral economics help explain important puzzles in development, with important limitations
- Taking behavioral development economics seriously will involve testing specific mechanisms and providing calibrations and estimations where possible (DellaVigna, 2018).
- Many unanswered questions remain and we hoped to have pointed at some of those in the preceding slides. So much more exciting work to be done!
- We did not cover some important topics in development to which behavioral economics may be fruitfully applied (e.g. education, political economy, economics of the family).

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