Materially Poor but Socially Rich:

How Community Trust Can Protect Low-Income Groups Against Myopic Decisions

Jon M. Jachimowicz
Columbia Business School
Center for Decision Sciences
jmj2183@columbia.edu

Salah Chafik
Columbia Business School
Center for Decision Sciences
salah@decisionsciences.columbia.edu

Sabeth Munrat
BRAC
sabeth.munrat@brac.net

Jaideep C. Prabhu
University of Cambridge
Judge Business School
j.prabhu@jbs.cam.ac.uk

Elke U. Weber
Princeton University
Woodrow Wilson School, Andlinger Center for Energy & Environment, and Department of Psychology
eweber@princeton.edu

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ABSTRACT

Why do the poor make shortsighted choices in decisions that involve delayed payoffs? Foregoing immediate rewards for larger, later rewards requires that decision-makers (a) believe that future payoffs will occur, and (b) are not forced to take the immediate reward out of financial need. Low-income individuals may be less likely to believe that promised future payoffs will occur, and less able to forego immediate rewards due to higher financial need; they may thus appear to discount the future more heavily. We propose that trust in one's immediate community—which, unlike generalized trust, we find does not covary with levels of income—can protect against the effects of low income on myopic decisions. Specifically, we hypothesize that low-income individuals with higher levels of community trust make less myopic intertemporal decisions because, based on their past experience, they believe their community will serve as a buffer, or cushion, against their financial need. This enables them to choose the delayed payoff if they prefer to do so. In archival data and lab studies, we find that higher levels of community trust among low-income individuals lead to less myopic decisions. We also test our predictions with a two-year community trust intervention in rural Bangladesh involving 121 union councils (the smallest rural administrative and local government unit in Bangladesh) and find that individuals in treated union councils make less myopic intertemporal choices than those in control union councils due to differential levels of community trust. We discuss the implications of these results for the design of domestic and global policy interventions to help the poor make decisions that could alleviate poverty.

KEYWORDS: temporal discounting, poverty alleviation, trust

SIGNIFICANCE

More than 1.5 billion people worldwide live on less than $1 a day. Even in the USA, roughly 14% live below the poverty line and more than 1.5 million households earn less than $2 a day per person. Despite many policies and programs aimed at its alleviation, poverty remains a domestic and global challenge; indeed, the number of US households earning less than $2 a day has nearly doubled in the last 15 years. One reason why the poor remain poor is their tendency to make myopic decisions. With reduced temporal discounting, low-income individuals could invest more in forward-looking educational, financial, and social activities that could help alleviate their impoverished situation. We show that increased community trust can decrease temporal discounting in low-income populations. We test this mechanism in a two-year field intervention in rural Bangladesh that targeted poverty alleviation through a low-cost and scalable method that builds community trust.

Do the poor make poor decisions? Recent evidence suggests that low-income individuals are more likely to make myopic decisions that favor short-term but neglect long-term outcomes (1, 2). Specifically, people living in poverty are more likely to discount future payoffs compared to wealthier individuals, which can be attributed in part to the specific environment in which these decisions are made. From poor US households (3) to rural Ethiopian farmers (4), lower wealth predicts higher temporal discount rates. These rates matter: a myopic orientation leads to a decreased likelihood of escaping poverty, as individuals fail to engage in behaviors that may benefit them in the long-term, such as investing in education, health and finances (1, 5, 6). This creates a vicious cycle: poverty leads to short-sighted decision-making which in turn leads to poverty, "a feedback loop that contributes to the perpetuation of poverty" (7). But *why* are poor individuals more likely to make myopic decisions, and what interventions can be designed to shift their decisions toward the long-term?

At least three broad theoretical perspectives address why poor people appear to be myopic. An economic perspective views individuals living in poverty as people who, like the rest of society, engage in actions that align with their goals in a rational manner (8, 9). Poor people make myopic decisions, then, because they lack the opportunities to alleviate their impoverished situation, and do the best they can under their circumstances. A sociological perspective describes the decisions of the poor as emanating from a 'culture of poverty' which often entails misguided goals and motives (10, 11). Because low-income individuals value different ends than those from other echelons of society, they make decisions contrary to their long-term interests. Finally, a recently proposed psychological perspective suggests that poverty itself affects individuals' information processing (7). Experimental and field studies suggest that poverty-related concerns consume mental resources, leaving less capacity for other tasks. This in turn

promotes higher discounting because individuals are not able to adequately plan for the future (1, 2).

Common to all three perspectives is the assumption that low- and high-income individuals share a similar calculating logic when trading off intertemporal choices. They differ in the reasons provided for why this logic gets skewed, proposing either a lack of opportunities, a lack of education, or limited mental bandwidth (1, 2, 8, 10–13). We suggest a related but different possibility, namely that the poor are engaged in a different kind of mental calculus. To even consider the possibility of accepting a delayed payoff—one that hasn't yet materialized—requires both a belief that the delayed payoff *will* occur (14, 15) and the ability to forego the immediate payoff (16). Whereas high-income individuals may ask, "is a delayed payoff of $100 worth $85 today?" low-income individuals are more likely to ask, "do I think I will really get the delayed payoff?" and "can I afford to forego the immediate payoff?" Such pessimism or skepticism may have multiple origins; adverse past experience with delayed payoffs failing to materialize, or the absence of good experiences to draw from (17, 18); and the tendency for low-income individuals to worry more about their immediate needs because these needs loom larger (19). Indeed, the ability to delay immediate payoffs is a luxury that only higher-income individuals can afford. Intertemporal choice is thus not only a question of discounting delayed payoffs for their distance in time, but also a question of (a) believing that delayed payoffs will occur, and (b) not being able to forego the immediate payoff.

Hence, we focus on a different, currently understudied, element of intertemporal decisions—trust—and use it to offer an alternative explanation that helps integrate and reconcile the three approaches above. Specifically, we argue that choosing delayed outcomes in making intertemporal decisions requires trusting that future payoffs will occur; thus, a lack of trust is

likely to be associated with a greater tendency to choose immediate over future payoffs (14, 15). Further, in the absence of such trust, it might actually be rational to favor the short over the long-term (as the economic perspective suggests; 8, 13). In contrast, the presence of trust may help reduce negative affect and stress, in turn improving the quality of long-term decision-making (as the psychological perspective suggests; 1, 2, 12). Finally, increasing trust can help change values, goals and motives to favor the long-term over the short-term (as the sociological perspective suggests; 10, 11). In all three cases, however, it is trust that is an underlying driver of the change in myopic behavior.

We present evidence from four studies using archival, correlational, experimental and field data to provide support for our hypothesis that trust drives long-term decision-making. Further, as we detail below, we suggest that two types of trust matter: (a) generalized trust, which extends to the social environment more generally, and has been shown to increase with income; and (b) community trust, which extends only to an individual's immediate community, which we find does not differ with income. We in particular highlight the role of community trust, and suggest that interventions designed to credibly increase community trust among low-income individuals may reduce their myopic behavior, in turn helping them improve their financial well-being.

The Role of Trust in Intertemporal Decisions

Investing in a long-term payoff option implicitly involves trust that the promised long-term benefits will materialize (14, 15). Studies conducted with young children show that when they do not trust their environment, they are less likely to forego immediate payoffs (e.g., a small quantity of a desired snack) for a delayed, larger payoff (e.g., a larger quantity of a desired snack 19–21). Indeed, in a situation where the receipt of a delayed option is not guaranteed, investing

in the short-term is likely the rational thing to do (15). This notion is perhaps best illustrated through the concept of 'counterparty risk.' Take the case of insurance (23). Even if a person taking out an insurance policy regularly pays her premium, there is a risk that the insurance provider may not make the payout when the insurance event is triggered. For the person to take out the insurance policy, she has to trust that the insurance provider will pay out the insured amount at a trigger event in the future. A lack of such trust is often at the heart of market failures in crop, health and life insurance among low-income communities around the world (24).

With lower levels of trust, individuals are more doubtful that a promised future reward will materialize, and may therefore be less likely to delay gratification (14, 15). Trust can be seen as a mechanism to deal with the impacts of unpredictability that helps individuals cope with social uncertainty and complexity (25). This notion is reflected in the political science literature (18) which recognizes 'generalized trust'—"a set of moral values [that] create regular expectations of regular and honest behavior" (26)—as an important source of individually and socially valuable outcomes, such as health and happiness (27, 28).Partly for these reasons, generalized trust has been shown to be play a crucial role in economic growth (e.g., 28, 29).

Finding 1: Generalized Trust Varies with Level of Income

But evidence suggests that levels of trust are unequally distributed throughout society. Trust can be thought of as a belief (31) that emerges from a number of observations or experiences over time (32). Individuals with higher incomes are more likely to have had favorable experiences in their lives, whereas those at lower levels of the income spectrum are more likely to have experienced violations of trust, leaving them with less trust in the environment (14, 33). Much of what poor people experience (e.g., negative income shocks) serves to reinforce a lack of control and therefore trust in their environment (34). As a result,

immediate rewards become more valuable as long-term rewards seem more improbable (15). The intertemporal decisions of low-income individuals may in part merely be factoring in the perceived uncertainty of long-term investments paying off.

To confirm these predictions, we analyzed data from the World Values Survey (N=220,145), a nationally representative survey conducted in almost 100 countries (35). Generalized trust in this survey is assessed through the question "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" Respondents can choose between two possible options: "Most people can be trusted," (coded as 0) and "Need to be very careful" (coded as 1). Although this single-item, dichotomous measure of generalized trust is problematic (36), a large number of studies have found important associations between this measure of generalized trust and other variables, such as the development of generalized trust through political institutions (37), ethnic background (17) or income inequality (38).

Income in the survey is self-reported on a scale from 1 (lowest group) to 10 (highest group), with respondents asked to consider "all wages, salaries, pensions and other incomes that come in" when responding. We estimate a logistic regression of income as a predictor of generalized trust and find that the coefficient of income is significant (β=-.07, SE=.002, p<.001), indicating that high-income individuals have higher levels of generalized trust. Thus, low-income individuals may be more doubtful that a long-term payoff will materialize, which can reduce the appeal of a larger, later option in intertemporal decisions.

Finding 2: Financial Needs Vary with Levels of Income

An additional determination low-income individuals have to make when evaluating a choice between a smaller, sooner and a larger, later option, is whether their current financial situation allows them to forego the immediate reward. A staggering proportion of U.S. households (i.e., nearly 50%) are unable to come up with $2,000 over the course of a month if they need to (16). When levels of savings are low, which is likely to be the case for low-income individuals, they may be unable to forego the smaller, sooner payoff because they require the money to alleviate their immediate needs (39).

To further investigate this issue, we recruited 285 participants from the United States to imagine a situation where they had to choose between receiving $100 today, or $150 in a year, and asked them to list some of the issues they consider when making this decision (see *SI* for additional details). Participants were also asked to respond to a three-item scale that measured financial need (e.g., "Given my current financial constraints, I need to take $100 today rather than wait for the delayed payoff ($150 in one year)"), their levels of income, and their levels of generalized trust, as measured through a six-item scale.[1] Finally, we asked participants which of the two choice options they would prefer, $100 today or $150 in a year.

116 individuals (40.7 %) stated that their current financial situation constrained their ability to consider both choice options, such that they felt compelled to take the $100 today because of immediate financial need. Unsurprisingly, we find that levels of income are related to financial need (β=-0.035, SE=.006, p<.001), such that lower income is related to higher financial need. When we introduce both financial need and income into a linear regression predicting the choice of delayed ($150 in a year) over the immediate option ($100 today), only financial need is

[1] We used this six-item measure of generalized trust with seven scale points in order to address potential validity concerns of the one-item, dichotomous scale used in the World Values Survey (81). This six-iten scale has been found to have sufficient validity and reliability and has been widely used in subsequent research (82–84).

a significant predictor (β=-.12, SE=.0013, p<.001), while income is not significant (β=.0011, SE=.0014, p=.41). Crucially, generalized trust is not related to financial need (β=.03, SE=.102, p=.76): beliefs regarding whether or not the long-term payoff will materialize do not influence participants' evaluation of their financial situation. Thus, in addition to their reduced belief that the long-term payoff will occur, low-income individuals seem less able to even consider whether or not they would prefer the long-term payoff because they cannot afford to forego the immediate reward. Does this, however, mean that low-income individuals necessarily have a myopic orientation, because they have lower generalized trust and higher financial needs?

Finding 3: Community Trust Can Act as a Buffer for Low-Income Individuals

Prior research has highlighted the role of the local community in influencing the experience of everyday life (27, 28). Communities can shape an individual's willingness to take financial risks. For instance, one study found that Chinese participants were less risk-averse than Americans, attributing this difference to cultural differences between the two groups. "In socially-collectivist cultures like China, family or other in-group members will step in to help out any group member who encounters a large and possibly catastrophic loss after selecting a risky option" (40). In contrast, in individualistic cultures such as the United States, individuals who make risky decisions are usually expected to face the possible consequences of these decisions. The social structure that reflects collectivistic societies therefore acts as a "cushion" against possible losses from risky decisions, allowing individuals in collectivistic societies to be less risk-averse (40–42). Crucially, such differences do not just exist between nations, but also within cultures (43, 44); one study suggests that nearly 80% of total cultural variation exists within, rather than between nations (14).

Supporting evidence for the important role of the local community also originates from research conducted on the "buffering hypothesis" (45, 46). This line of reasoning suggests that strong ties to close others have beneficial effects on an individual's well-being because their social support protects people from the potentially detrimental influence of stressful events. The perceived availability of support allows individuals to appraise stressful situations as less aversive, which in turn makes it less likely that they have a negative effect on the individual (47). Because higher financial need is often experienced as stressful (39), stronger support from the local community may also reduce the aversive impact of financial need.

Importantly, trust in one's local community to "cushion" against the potential fallout of risky decisions, or "buffer" against the stress of lower income, may be distributed more evenly across the income spectrum. Presumably, such community trust is also based on experiences where trust in one's local community is rewarded or not, but these experiences may be more determined by social rather than economic factors. To address this question, we again turn to the World Values Survey. In the survey, individuals respond to the question: "I'd like to ask you how much you trust people from your neighborhood. Could you tell me whether you trust people from this group?" Respondents have four possible options: (a) "Trust completely," (b) "Trust somewhat," (c) "Do not trust very much," or (d) "Do not trust at all." We use this data to test if responses vary with levels of income and find that no such relationship exists. Specifically, we conducted an ordinal logistic regression of community trust against levels of income and find that levels of income do not predict levels of community trust (p=.15; see *SI*).[2]

In addition, we also measured levels of community trust using a 13-item measure (adapted from (47)) in the previous study (with 285 U.S. participants) (e.g., "I do a lot of good

[2] Although the correlation between generalized and community trust is significant (r=.328, p=<.001), the divergent relationship to income provides support for the view that the two sources of trust can be thought of as distinct.

things in my neighborhood" and "There are advantages to living in my neighborhood"). We relate community trust to our measure of financial need, and find a significant negative relationship (β=-.58, SE=.136, p<0.01), such that those individuals with higher community trust reported lower financial need. This relationship also holds when adding income as an additional predictor (β=-.40, SE=.126, p<0.01). Hence, higher community trust may influence the choice of delayed payoffs by reducing low-income individuals' perceived constraints. When needs are not felt as acutely, low-income individuals with higher community trust may be more able to consider the long-term option, and not feel compelled by their current financial situation to choose the immediate reward.

Accordingly, we argue that it is important to consider the effects of *community* trust as distinct from *generalized* trust on the long-term decisions of the poor. Although both higher levels of either generalized or community trust can theoretically support the choice of a delayed payoff, we propose that a focus on community trust is a more viable basis for an intervention to reduce the choice of myopic intertemporal choices amongst low-income individuals. First, because community trust does not covary with income while generalized trust does, low-income individuals may already have higher base rates of community trust, and this may make a further intervention simpler and more effective. Second, a wealth of prior literature highlights that the beliefs individuals hold are often very difficult to change. While interventions designed to influence personal beliefs do exist (49–51), research has found that personal beliefs are often resistant to change (52, 53).[3] Hence, attempting to change an individual's beliefs, especially if

[3] For instance, one study found that providing car drivers with information about savings from reduced car usage, or information on environmental harm, or both, had virtually no effect on their driving behavior and lead to psychological commitment to their initial personal belief (85). In another example, a large-scale field experiment in Rwanda which ran over the course of a year and repeatedly exposed groups of listeners to prejudice-reducing messages through a radio soap opera, had little impact on people's beliefs (86, 87); although it was effective in changing listeners' perceptions of what other people believed.

they are central to the individual's self-view (54), has proven to be challenging. At the very least, changing beliefs requires repeated, in-depth exposure and experiences that serve to reinforce the intended belief change. Creating such an intervention to change generalized trust would require far more time and intense exposure than an intervention to change community belief would. Generalized trust is more entrenched a belief and less amenable to change.

Third, while generalized trust influences intertemporal choices by signaling to individuals how likely it is that the long-term payoff will occur, community trust influences the level of financial need individuals experience and thus their ability to even consider foregoing the immediate payoff. There may, however, be instances where a lack of generalized trust is warranted, i.e., where the delayed payoff—should individuals choose it—does not occur. Thus, an intervention that intends to increase levels of generalized trust may backfire when low-income individuals choose the larger, later option, and it does not materialize. Instead, a focus on community trust may be less likely to backfire because its higher levels ameliorate the financial constraints low-income individuals face. This then allows individuals to adequately consider whether they want to choose an immediate or delayed option, and thus to behave according to their preferences.

Study 1: Community Trust and Temporal Discounting by Low-income Individuals

This study was an online experiment with 647 participants from the United States (see *SI* for additional details). We first presented respondents with the same 13-item scale of community trust as above (55). We then assessed their temporal discount factor (the multiplier that equates $100 in a year's time with the dollar amount that an individual is willing to take instead, if received today) using DEEP (56), an adaptive testing platform where participants repeatedly choose between a smaller payoff that is received closer to the present (Smaller/Sooner) and a

larger one that is received further into the future (Larger/Later). Although decisions are hypothetical, discount factors have been shown to predict real-world intertemporal decisions, such as mortgage choices (57), and their consequences, such as credit scores (58). Indeed, decisions in other delay-discounting tasks have been shown to be predictive of a wide range of long-term outcomes, such as health, education, and retirement savings, amongst others (14, 59–65). Finally, respondents reported their current levels of income, as well as their gender, age and education.

Replicating previous studies (1, 2, 7), we find that discount factors vary with levels of income (β=.0034, *SE*=.0015, *p*=.021), such that individuals with higher levels of income discounted the future less heavily than those with lower levels of income. To illustrate this, we categorized participants with household incomes below $40,000 as low-income and those with incomes above $40,000 as high-income, and found that low-income participants discounted the future more heavily (*M*=.131, *SE*=.006) than high-income participants (*M*=.159, *SE*=.006), with lower discount factors indicating greater discounting.[7]

Next, we regressed the discount factor on continuous income and community trust as well as the interaction between the two predictor variables. In addition to the main effect of income already mentioned, we find a main effect of community trust (β=.0015, *SE*=.0007, *p*=.025), such that individuals with higher levels of community trust discount the future less heavily. Both main effects are qualified by a significant interaction between community trust and levels of income on temporal discounting (β=-.0052, *SE*=.0023, *p*=.026). These effects also hold when we control for demographic variables such as age, gender, and education (see Table 1).

[7] This cut-off point represents the median in our sample. A sensitivity analysis reveals that cut-off points higher or lower than $40,000 do not significantly change our results. Similar cut-off points are often used in prior research (88–91).

Enter Table 1 about here

To better understand the interaction between community trust and income, we next conducted simple slopes analyses (66, 67) and found that higher levels of income were only related to lower discounting of the future when levels of community trust were low ($t(643)=2.86$, $p=.0044$) but not when levels of community trust were high ($t(643)=-.032$, $p=.748$). Hence, only individuals with low incomes and low levels of community trust differ significantly from all other groups (see Figure 1).

Enter Figure 1 about here

We now turn to Study 2 which seeks to examine the impact of community trust on the temporal discounting of low-income individuals in a richer real-world context.

Study 2: Community Trust and Payday Loans

In Study 2 we investigate whether taking out a payday loan—a typical form of myopic behavior displayed by low-income individuals—varies with levels of community trust (see *SI* for additional details). To do so, we combine state level data from the Survey of Household Economics and Decision-making (SHED) with an additional survey that measured community trust, which we conducted among 5,721 US participants in 50 states.

We recruited US participants through a stratified sampling method, such that ~100 participants responded per state. Participants responded to questions assessing their levels of community trust using the same scale as in Study 1. Based on these responses, we created state

averages.[8] We also obtained state-level data of additional control variables, such as income, unemployment, and age. Through SHED, we accessed state-level data on payday loan usage, and matched both datasets at the state level.

An OLS regression with state-level payday loan usage as the dependent variable and state-level community trust as the independent variable finds that community trust predicts payday loan usage (β=-.15, *SE*=.041, p<.001). This effect also holds when we control for a number of other variables such as age, income, and unemployment.[9]

Although Studies 1 and 2 suggest that community trust plays a role in buffering low-income individuals against myopic discounting (and hence myopic financial behavior), this evidence is correlational. We now turn to a study which attempts to establish causal evidence for our thesis.

Study 3: Exploring the Causal Link between Community Trust and Temporal Discounting by Low-income Individuals in the Lab

We recruited 120 participants online and assigned them to one of four possible conditions in a 2-by-2 design. Specifically, the design involved manipulating levels of *felt* income (low/high) and levels of *felt* community trust (low/high). To induce low versus high levels of felt income, we used scenarios previously developed and validated by Shah et al. (2). Participants in the high felt-income condition were asked to imagine scenarios with relatively minor financial

[8] Although participants in this study were not exclusively low-income, we are able to generate state-level averages of community trust because our previous findings indicate community trust does not differ with income. State-level variation in community trust could be driven, for example, by population density, health levels, crime rate, or unemployment rate. We assume that those drivers similarly affect participants across all income levels.

[9] We ran additional analyses that relate community trust to a range of other variables. Community trust is not significantly related to population density age, or savings. However, we do find that community trust is marginally related to levels of unemployment (r=-.27 , p=.056), such that higher levels of unemployment are related to lower levels of community trust. In addition, community trust is also related to the percentage of individuals who identify themselves as being "unbanked" (r=-.44 , p=.001; 82), such that higher levels of "unbanked" citizens were related to reduced levels of community trust. In addition, we find that savings are significantly related to payday loan usage (b=-1.26, *SE*=.59, p=.033), such that higher levels of savings are related to lower levels of payday loan usage.

implications, while those in the low felt-income condition were asked to imagine scenarios with more severe financial implications.[11] Imagining more severe financial implications has been shown to evoke feelings of having lower income (2).

We manipulated levels of community trust by increasing the salience of this construct in the minds of respondents (68). We gave participants a definition of community trust ("the extent to which you trust your community"). We then asked them to list either two (low) or ten (high) examples from their own experience where community trust was justified. In contrast to studies that use a similar design to manipulate difficulty-of-retrieval (69), participants in this study had to produce the full number of examples requested. Subjects did not experience difficulties in providing examples.[12] Next we assessed temporal discounting using DEEP (56). We also collected data on several demographic variables.

Consistent with what we would expect if our manipulation of felt-income was successful, we found that participants in the low felt-income condition were more myopic (M=.14, SE=.015) than participants in the high felt-income condition (M=.178, SE=.017, p=.044). We examined whether community trust serves as a buffer for individuals with lower levels of felt income by testing for an interaction effect between levels of community trust and felt income on the temporal discount factor. An ANOVA with felt income and manipulated community trust as the

[11] For example, participants were asked to imagine: "The economy is going through difficult times; suppose your employer needs to make substantial budget cuts. Imagine a scenario in which you received a 5% (15%) cut in your salary. Given your situation, would you be able to maintain roughly your same lifestyle under those new circumstances?" Participants were then asked to elaborate, being prompted "Why or why not? If not, what changes would you need to make? Would it impact your leisure, housing, or travel plans?"

[12] Participants in the 10-example condition wrote an average of 944.96 characters (SE=55.39), more than three times as much than participants in the 2-example condition who wrote an average of 307.4 characters (SE=20.43). Crucially, for participants in the 10-example condition, there is no difference in the number of characters written for the first example (M=88.04, SE=5.71) relative to the last example (M=104.28, SE=9.25; t=-1.49; p=.139), indicating that participants did not find it difficult to generate 10 examples. The alternative prediction, based on research investigating the 'ease-of-retrieval' effect (69), would have predicted that participants would find 10 examples harder to generate, such that latter examples were shorter. This would have lead to lower levels of felt community trust, which is opposite to what we find.

independent variables and the temporal discount factor as the dependent variable shows a marginally significant interaction ($F_{(3,116)}$=3.109, p<0.10).

To further investigate which condition is driving this effect, we conducted pairwise comparisons. These revealed that three conditions differ significantly from a fourth. Participants in the low felt income, low community trust condition were more myopic (*M*=.113, *SE*=.019) than individuals in the low felt income, high community trust (*M*=.178, *SE*=.024; *p*=.04), high felt income, low community trust (*M*=.176, *SE*=.018; *p*=.032) and high felt income, high community trust (*M*=.179, *SE*=.03; *p*=.045) conditions. These results hold when controlling for additional control variables (e.g., age, gender, education and actual income).

Study 3 provides lab-based causal evidence in support of our hypothesis that low-income individuals with higher levels of community trust discount the future less heavily than low-income individuals with lower levels of community trust. While our previous studies show that community trust does not vary by income and that perceptions of such trust can be manipulated in a lab setting, we now turn to showing that community trust can be built in a real-world context and test if doing so reduces myopic intertemporal decisions. To provide this field-based causal evidence, we describe a study based on a two-year intervention designed to increase the levels of community trust in 121 union councils (the smallest rural administrative and local government units) in Bangladesh.

Study 4: Exploring the Causal Link between Community Trust and Temporal Discounting by Low-income Individuals in the Field

In this study, we sought to replicate our findings in a field setting featuring a different cultural context and involving ultra-poor individuals (see *SI* for additional details).[14] To do so, we

[14] Before the intervention, we contacted 111 participants to assess demographic information. On average, surveyed participants indicated they had incomes of about Tk. 1600 for each household member (*M*=1603.53, *SD*=712.43),

collaborated with BRAC, an international development organization based in Bangladesh, and The Hunger Project (THP), a global non-profit organization with headquarters in New York.

In February 2014, BRAC and THP launched a two-year intervention designed to increase community trust in 121 union councils in four districts of Bangladesh (Kishoreganj, Habiganj, Sunamgonj, and Bagerhat). Sixty-one union councils received the intervention while 60 union councils were in the control condition (see Table 2 for demographic information, and *Methods* and *SI Text* for additional details).

Enter Table 2 about here

The intervention had two components. First, volunteers from the community were trained to act as intermediaries between the community and local government. This required the volunteers to interact with other members of their community, provide input into local governance, and help residents access public services from the local government. Second, a platform was created for inclusive community-driven governance to change the way community-level decisions were made. This involved representatives from the community working with the local government to make community-level decisions, for example in the distribution of social benefits, the allocation of funds and resources for development projects, and the selection of people to employ in publicly funded project.

Prior to the intervention, we assessed levels of temporal discounting and community trust for a small sample of 111 participants and found community trust to be a significant predictor of temporal discounting (β=.158, *SE*=.037, p<.001), such that higher levels of community trust

which equals to roughly $20.50 per month per household member – or less than $1/day. Incomes were calculated as average monthly income divided by number of household members.

were associated with lower temporal discounting. At the end of the two-year intervention, we surveyed individuals (*N*=1,447) in all 121 union councils on their levels of community trust as well as assessing their temporal discounting.[16] We measured temporal discounting using a pen-and-paper titration measure (70).

We first tested whether our intervention increased levels of community trust in treatment union councils. Our intervention was successful: we find a significant difference in levels of community trust between treatment and control union councils (estimate=-.14, SE=.026, $p<.001$), such that levels of community trust (ranging from 1 to 5) are higher in treatment (*M*=3.45, *SE*=.0015) than control union councils (*M*=3.31, *SE*=.0013). There were no significant differences between treatment and control union councils for generalized trust.

We next specified a hierarchical linear model, which nests union councils within condition, and clusters standard errors at the union council level. This allows us to account for differences between union councils and provides a more accurate analysis of the treatment effect. Our dependent variable is individuals' temporal discount factor, as indicated through their responses on the choice titrator.

As Table 3 shows, participants in treatment union councils were significantly more likely to discount the future less heavily (β=.081, *SE*=.034, *p*=.018).[17] In concordance with our prior

[16] We were unable to collect data at the end of the intervention for four of the 121 village union councils, two in the control and two in the treatment condition.

[17] We also investigated whether individuals who were relatively better off were less likely to be beneficially affected by higher levels of community trust. To do this, we ran a 2-way interaction between treatment and average income on temporal discounting rates. We find no significant interaction (*p*=.94) and only a significant main effect of treatment (*p*=.021) on intertemporal discount rate. However, we want to highlight the extremely low-income levels of participants in this study. At the mean, participants had less than $1/day per household member (~$23.20/month). At one standard deviation above the mean, participants had ~$1.35/day (~$40.64/month), and even at two standard deviations above the mean, participants just barely surpassed the World Bank's international poverty line of $1.90/day (at ~$1.94, or $58.11/month). Thus, it is highly unlikely that the effect of community trust should vary for relatively richer participants in our study because the most, if not all, participants in our sample had trouble making ends meet, and were thus likely beneficially affected by higher levels of community trust.

studies, measured generalized trust, as shown in Model 2, is an additional significant predictor (β=.54, *SE*=.13, $p<.01$), such that those individuals with higher levels of generalized trust are more likely to discount the future less heavily. Finally, Model 3 shows that the addition of additional control variables does not significantly influence individual's tendency to discount the future.[19] Importantly, gender, the only demographic variable that differed across conditions, had no significant effect on temporal discounting, similar to findings of prior research (71).

Enter Table 3 about here

In sum, this field study shows that an intervention designed to increase levels of community trust successfully does so and, in the process, affects temporal discounting, such that individuals in treatment union councils are less myopic in their intertemporal decisions than individuals in control union councils.

DISCUSSION

Low-income individuals are more likely to make myopic decisions. This can, in turn, make it more difficult for them to alleviate their impoverished condition. At least three broad perspectives have addressed why low-income individuals are more likely to discount the future more heavily. An economic perspective views individuals living in poverty as people who, like the rest of society, engage in actions that align with their goals in a rational manner (8, 9). Poor people make myopic decisions, then, because they lack the opportunities to alleviate their impoverished situation, and do the best they can under their circumstances. A sociological

[19] In order to alleviate concerns of endogeneity we also ran a two-stage least squares model (93), with treatment as the instrumental variable, community trust as the explanatory variable, and discount factor as the dependent variable. The model results are consistent with the hierarchical linear model specified above, such that community trust remains a significant predictor of discount factor (β=.27, *SE*=.13, $p=.032$).

perspective describes the decisions of the poor as emanating from a 'culture of poverty' which often entails misguided goals and motives (10, 11). Because low-income individuals value different ends than those from other echelons of society, they make decisions that may run contrary to their long-term interests. And a psychological perspective suggests that poverty itself affects individuals' information processing (7). Experimental and field studies suggest that poverty-related concerns consume mental resources, leaving less capacity for other tasks. This in turn promotes higher discounting because individuals are not able to adequately plan for the future (1, 2). These perspectives share the assumption that low- and high-income individuals use a similar logic in their trade-off calculation.

In this paper, we focus on a different, understudied, element of intertemporal decisions—trust. We show that low-income individuals are more likely to make myopic decisions because (a) they have lower levels of generalized trust, thus reducing their belief that the delayed payoff will occur; and (b) they have higher levels of financial need, thus constraining their ability to forego the immediate payoff. Because community trust partially offsets financial need, those low-income individuals with higher levels of community trust make less myopic intertemporal decisions. We also show that by increasing perceived or actual levels of community trust, we can reduce the myopic behavior of low-income individuals, potentially helping them improve their financial well-being. Generalized trust, in our studies as well as in previous work, also affects people's delay discounting but may be more difficult to change because of the limited amount of trust-building experiences available. It is worth noting that our community trust intervention in Study 4 did *not* impact levels of generalized trust.

Our work makes three contributions. First, we highlight that aside from the differential impact of time delay, individual and group differences in intertemporal choice may also be the

result of differences in beliefs that long-term payoffs will occur as well as the ability to afford foregoing immediate payoffs. Because low-income individuals are less likely to generally trust their environment, myopic decisions may reflect not just greater impatience, but rather a lack of belief that the long-term payoff will occur. In addition, because low-income individuals are more likely to experience greater financial need, myopic decisions may also reflect an inability to consider the long-term option. This view allows us to integrate previous approaches that have attempted to explain why low-income individuals are more likely to discount the future more heavily, and provide a single consistent explanation capable of reconciling differences between approaches. Specifically, in the absence of trust, it might actually be rational to favor the short over the long-term (as the economic perspective suggests). Further, the presence of trust can help reduce negative affect and stress, in turn improving the quality of long-term decision-making (as the psychological perspective suggests). Increasing trust can help change values, goals and motives to favor the long-term over the short-term (as the sociological perspective suggests). Finally, those low-income individuals who trust their community may be more willing to choose delayed payoffs because they can rely on their community to help alleviate their financial needs, which in turn allows them to consider foregoing immediate payoffs. In all cases, trust is an underlying driver of the change in myopic behavior.

Second, we distinguish between generalized trust, which we and others show to vary with income, and community trust, which we show does not. Because community trust only deals with an individual's immediate social environment, and not with the general environment as a whole, interventions need only focus on an individual's direct social environment, rather than the general environment as a whole. Generalized trust reflects a more enduring mindset, whereas

beliefs about one's community are drawn from people's transactions and interactions with their immediate surroundings, which are more amenable to targeted interventions.

Third, our theoretical model generates a novel intervention strategy that we tested in the context of rural Bangladesh. Specifically, an intervention designed to increase levels of community trust was effective in shifting temporal preferences toward the long-term, offering a feasible, scalable, and relatively low-cost approach to possible poverty reduction. Such an approach has benefits over interventions based on prior perspectives on the myopic behavior of low-income individuals. Prior interventions that have provided low-income individuals with more opportunities, for example through microfinance, have produced mixed results (72, 73). Interventions that attempt to directly change levels of income through direct cash transfers may alleviate the impact of poverty on cognition and momentarily shift discount rates toward the long-term (74). However, cash transfer programs can be expensive and breed a culture of dependency, making them politically problematic. For example, 77% of Swiss voters recently rejected a proposal to introduce a guaranteed minimum income for all residents (75). Finally, educating low-income individuals to value the long-term more, for example through financial literacy programs, has also had only limited impact (76). In contrast, this paper highlights a relatively low-cost, empowering and scalable intervention.

While each of our studies has its individual limitations, we deliberately adopted a multiple study strategy that varies methods, types of data, and contexts. Our aim was to ensure that the strengths of each study would compensate for the weaknesses of the others, and that taken together, they would generate broad support for our theoretical model. Thus, in our lab and field studies, we focus on temporal discounting but do not examine whether changes in temporal discounting lead to changes in future downstream behavior. Previous studies, however, have

highlighted the relationship between temporal discounting and real-world behavior (56–65). Further our archival study using SHED data shows that our model holds when predicting real world behavior at the aggregate (state) level, in particular payday loan usage. And while the archival study did not use individual-level data for payday loan usage, we attempted to provide this level of rigor in our controlled experimental studies in the lab. Finally, while our lab studies lack external validity, we aim to provide this through our two-year field study that manipulates levels of community trust in rural Bangladesh.

Due to field constraints, we were unable to collect data from the same individuals before and after the intervention in Bangladesh. Doing so would have allowed for a more powerful research design including a difference-in-difference comparison (77). We also did not incentivize our intertemporal choice tasks. While it is preferable to use incentivized tasks, hypothetical choice tasks are widely used and are predictive of real-world outcomes (58, 78). Future research should incorporate a repeated-measures design that incentivizes intertemporal choices before and after intervention and tracks the impacts of the intervention in important real-world outcomes, such as levels of income over time. Finally, increasing levels of community trust should only be viewed as a viable intervention when the environment merits it. Shifting temporal preferences toward the long-term should be accompanied by a greater likelihood that those outcomes materialize for individuals. If this does not occur, individuals who have invested into the future may incur costs from delaying payoffs and gained trust may be lost. We therefore recommend building earned community trust, as we did in our field study, and not just the perception of community trust, as we did in our experimental study.

Poverty is one of the world's most vexing problems. Though great progress has been made in reducing it, progress is often impeded by the fact that low-income individuals tend to

discount the future more than is advised, in part due to their lower generalized trust and higher financial need. There is still a long way to go in alleviating poverty both domestically, and globally. For example, even in the US, the number of households with less than $2 per day per person has nearly *doubled* in the last 15 years (79, 80). To better tackle this challenge, our theory and results suggests policy should move beyond a focus on the low-income individual, and instead provide additional emphasis on the low-income community. As the English poet John Donne wrote, “No man is an island, entire of itself; every man is a piece of the continent, a part of the main.” The poor may lack in material wealth relative to the rich, but they possess social wealth in the shape of their communities upon which they can draw. Building and boosting community trust can help decrease myopic decision-making and, in turn, contribute to reducing the incidence of poverty worldwide.

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TABLE 1

Temporal Discounting Predicted by Income and Community Trust

	Model 1	**Model 2**	**Model 3**	**Model 4**
(Intercept)	.1269***	.0913***	-.0053	-.0127
	(.0089)	(.0243)	(.0484)	(.0523)
Income	.0034*		.0221*	.0204*
	(.0015)		(.0088)	(.0089)
Community Trust		.0149*	.0376**	.0371**
		(.0067)	(.0135)	(.0135)
Income * Community Trust			-.0052*	-.0050*
			(.0023)	(.0024)
Sex				-.0038
				(.0089)
Age				-.0003
				(.0004)
Education				0.0045
				(.0026)
R^2	.0082	.0077	.0203	.0257
Adj. R^2	.0067	.0062	.0157	.0166
Num. obs.	647	647	647	647
RMSE	.1121	.1121	.1116	.1116

*** p < 0.001, ** p < 0.01, * p < 0.05

TABLE 2

Field Study Descriptive Statistics

	Control	**Intervention**
Number of Union Councils	60	61
Community Trust	3.31 (0.60)	3.45 (0.58)
Generalized Trust	3.67 (0.71)	3.70 (0.71)
Mean Age	33.83 (10.5)	33.10 (11.09)
Sex (0=Male, 1=Female)	0.31 (0.50)	0.47 (0.47)
Average Monthly Income (in Bangladeshi Taka)	1935.31 (1367.34)	1956.94 (1525.75)
Education	10.80 (2.95)	10.97 (2.72)

Note: Standard deviation in brackets. Average Monthly Income reported as household income divided by household members. 1000 Taka = 12.49 USD (13th February 2017). Chi-Square test reveals only gender differed between conditions, otherwise there were no significant differences.

TABLE 3

Hierarchical Linear Regression With Unions Nested Within Condition and Dependent Variable Temporal Discounting Factor

	Model 1	**Model 2**	**Model 3**
(Intercept)	.39***	.10	.06
	(.06)	(.09)	(.11)
Treatment (0 = Control, 1 = Treatment)	.08*	.09*	.08*
	(.03)	(.03)	(0.03)
Generalized Trust		.54***	.54***
		(.13)	(.13)
Age			.00
			(.00)
Sex (0 = Male, 1 = Female)			.01
			(.02)
Average Income			.00
			(.00)
Education			.00
			(.00)
AIC	-49.04	-62.79	-12.53
BIC	-29.72	-38.64	30.90
Log Likelihood	28.52	36.39	15.26
Num. obs.	928	928	928
Num. groups	117	117	117

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

FIGURE 1

Temporal Discount Factor as a Function of Income and Community Trust