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Loss aversion or lack of trust: Why does loss framing work to encourage preventive health behaviors?

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ABSTRACT

We implement a field experiment designed to increase participants' willingness to visit a health clinic. We find that framing a $50 incentive as a loss rather than a gain increases take-up, but we do not find support for the notion that loss aversion is responsible for the effectiveness of loss framing. Instead, it appears that loss framing promotes take-up by raising the perceived probability that the incentive will be provided as promised. The results suggest trust is an alternative pathway through which loss framing may affect behavior, and trust may be an important way to promote desirable health behaviors.

1. Introduction

Standard economic theory predicts that policymakers can use financial incentives to encourage desirable behavior, and such incentives are common in a range of domains, including education (Bettinger, 2012), charitable giving (Almunia et al., 2020), and health (Kane et al., 2004; Marteau et al., 2009). Behavioral economics suggests that seemingly minor differences in the framing or design of these incentives can have meaningful impacts on decision-making. Factors such as the uncertainty of incentives, the timing of incentive payments, and whether payments are viewed as a gain or a loss can impact take-up (Madrian, 2014; Vlaev et al., 2019). Policymakers are increasingly considering ways to leverage behavioral insights to maximize the effectiveness of the incentives they provide (Strassheim, 2021).

This study measures the causal impact of loss and gain frames on incentive take-up in a real-world preventive health context, and it seeks to understand why the impacts of loss-framed incentives differ from those of gain-framed incentives. The loss-framing approach involves imbuing individuals with a sense of ownership over an incentive up front, with the threat of taking the incentive away if the desired goals are not met. Compared to a gain-framing approach that offers a reward for a desired goal, framing the incentive structure around losses has been shown to increase incentive effectiveness in educational, employment, and health contexts (Volpp et al., 2008; Fryer et al., 2012; Hossain & List, 2012; and Levitt et al., 2016).

We implement a randomized field experiment that compares loss versus gain framing to promote preventive health care utilization. We offer individuals in low-income neighborhoods in and around Dearborn, Michigan, an incentive to visit a nearby community health clinic. In the loss-framed treatment, participants receive an inactive Visa gift card worth either $50 or $10 that can be activated by visiting the clinic; they will effectively lose the value of the card if they choose not to visit a clinic. In the gain-framed treatment, participants instead receive a physically similar "reminder card," with the promise that they can exchange it for a gift card if they visit the health clinic. In both cases, any participant who went to the health clinic would receive an active Visa

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gift card, and any funds remaining after the visit could be spent elsewhere. We measure the impact of the incentive framing on visits using administrative clinic data, and random treatment assignment means that we can attribute differences in response rates to the causal impact of the frames.

Consistent with prior lab and field experiments, we find that the loss-framed incentive is more effective than a gain-framed incentive, increasing take-up rates by 4.7 percentage points, or 17 percent relative to the gain-framed redemption rate of 27 percent, which is statistically significant at the 5-percent level. Our paper then builds upon previous studies by exploring the role of two potential explanations for the effectiveness of loss framing: loss aversion and trust. It is theoretically and practically important, though empirically challenging, to distinguish between a loss-framing effect stemming from *loss aversion* and that driven by the participant's *trust* that the incentive will be delivered.

To do so, we first build a theoretical framework that links loss aversion and trust to incentive take-up. The most common explanation for the success of loss framing stems from prospect theory, a behavioral economics model positing that individuals are more sensitive to losses than equivalent gains relative to a reference point (Kahneman & Tversky, 1984). Loss-averse preferences yield an observed asymmetry in decisions over losses versus gains because loss-averse individuals value something they own (or, more precisely, something incorporated into their reference point) more than the equivalent object they do not yet own. Because loss framing is designed to induce a sense of ownership over an incentive, individuals are more responsive to incentives that are framed as a loss. In our context, loss framing may give participants a sense of ownership of the incentive payment before making their decision about whether to visit the clinic. Thus, if loss framing is effective because of loss aversion, we expect participants will be more responsive to the loss-framed incentive (Visa gift card) than the gain-framed incentive (reminder card), and we also expect the gap to be largest among those with higher measured loss aversion.

This framework also predicts a relationship between trust and take-up. The perceived probability of receiving a reward is likely higher for someone who has a tangible reward in hand relative to someone hearing about a promised reward. Those who are not initially familiar with or trusting of the person or institution offering the incentive may be less likely to believe that the incentive will be delivered as promised if they visit the health clinic. Among those without established trust in the organization, a Visa gift card given *ex ante* through the loss frame is likely to be viewed as more trustworthy than a generic gain-framed reminder card that promises a gift card. If trust is an important determinant of the responsiveness to loss framing, we expect that participants will respond more to the loss frame (Visa gift card) than the gain frame (reminder) card and that the gap will be most evident among those with lower baseline levels of trust in the organization. Because loss framing raises mistrusting individuals' expected probability that they will eventually receive the incentive, the observed response to loss framing could arise even in the absence of loss-averse preferences. This trust-related response to loss framing may be more relevant in the field context than in a more controlled lab setting.

Empirically, we examine whether loss framing appears to be effective because of loss aversion or because of trust. We do not find support for the notion that the differential response stems from loss aversion. Recipients are not significantly more responsive to the loss frame incentive when they are more loss averse, likely because the sense of ownership induced by the loss framing is insufficiently strong.

In contrast, baseline trust of our partner organization strongly predicts differential responsiveness to the two frames. Take-up is higher for the loss frame than the gain frame incentive, but only among those who do not trust the partner organization at baseline. For those who distrust or are unfamiliar with ACCESS, the loss frame appears to be a more trustworthy, and hence more effective, incentive. We conclude that loss framing works because it raises the perceived probability that the incentive will be delivered as promised. In this context, trust is an important determinant of the effectiveness of incentives to promote desirable health behavior.

2. Previous literature

It is well established that loss framing makes a difference in the lab setting (e.g. Hannan et al., 2005), but the literature investigating the application of loss framing to field or real-world contexts is less well developed. A handful of field experimental studies investigates whether it is possible to use loss framing to induce a desired behavior. For example, Volpp et al. (2008) allow treatment group participants in a weight loss study to put their own funds (with a financial match from the researchers) in a deposit contract; these funds were returned to the individual if they met weight loss goals. The treatment group lost statistically more weight than a control group without the deposit contract, which the authors interpret as an indication that behavioral biases can be exploited to improve health behavior. (There was no equivalent gain frame included in the study.)

Fryer et al. (2012) conduct a more direct comparison of loss versus gain framing and find that teachers respond more to "pay-for-performance" incentives when the incentives are framed as a loss. Teachers in the "loss" treatment were given $4000 (the expected value of the bonus) at the beginning of the school year and signed a contract that they would return some or all of the funds if their students did not make sufficient improvement in math achievement. In the "gain" treatment, teachers received the bonus at the end of the year. The incentive was associated with markedly higher math performance when framed as a loss, which the authors interpret as stemming from loss aversion.

Similarly, Levitt et al. (2016) incentivize exam performance among students in the Chicago area using a variety of treatment arms motivated by the behavioral literature. In one set of experiments, one group of students received an incentive ($20 or a trophy) before taking the exam and were told they would need to return the incentive if they did not improve. Another group of students was not given the incentive up front, but they were told they would receive it (it was held up at the front of the room by the administrator) if their test scores did improve. The authors find somewhat higher effect sizes for incentives framed as a loss, although the differences in responsiveness are not statistically significant. They interpret the finding as suggestive, but not definitive, evidence that loss aversion may be exploited to improve responsiveness to incentives. In a footnote, they also point out that incentive framing may also affect salience and "trust and subjective beliefs with respect to the actual payout."

Another related field experiment (Hossain & List, 2012) involves productivity incentives for workers in a Chinese electronics factory. In that study, some workers were provisionally given a bonus at the beginning of the work week and were told it would be retracted at the end of the week if they failed to meet certain performance targets (loss frame). Other workers were promised an *ex-post* bonus (gain frame) if they achieved the targets. As is the case in our experiment, the actual incentive payment was received at the same time by both groups of workers, but the framing differed. The results suggest that teams are more responsive to the incentive when it is framed as a loss.

Most studies focus on loss aversion as the likely explanation for the effectiveness of loss framing. However, that field experiments tend to yield much smaller responses compared to lab experiments suggests that other factors may be important (Ferraro & Tracy, 2022). To our knowledge, there are no field experiments investigating trust as a potential alternative explanation. Lab evidence does suggest that the perceived probability of receiving an incentive could affect decision-making. Ericson and Fuster (2011) demonstrate that individuals report a higher valuation of an object when they are told they have a higher probability of receiving it. More broadly, the social context can matter for experimental findings. For example, Brandon (2020) finds differential effects of an LED light bulb intervention depending on whether households could opt out of the experimental

sample without social pressure.

Existing work focused on mistrust of the medical system indicates that the role of trust may be particularly important in the healthcare domain. For example, Blendon et al. (2014) document that fewer than half of low-income Americans believe that doctors can be trusted. Exploiting geographic differences in the fall-out from the infamous Tuskegee syphilis experiment, Alsan and Wannamaker (2018) document that mistrust of medical professionals is associated with worse health outcomes for African American men. La Veist et al. (2009) document an association between mistrust of healthcare organizations and under-utilization of health services. Similarly, researchers have documented an association between willingness to get the COVID-19 vaccine and trust in the government (Chaudhuri et al., 2022).

3. Preventive health care

Although most prior work on loss framing has not been in the healthcare context, financial incentives are widely used to promote the use of preventive healthcare. A 2019 survey of large corporations found that four-fifths offer financial wellness incentives, which average $762 per employee (Business Group on Health, 2020). Incentives have been found to be effective in promoting the usage of preventive health services, particularly for one-time actions (see Kane et al., 2004; Jochelson, 2007; and Sutherland et al., 2008 for comprehensive reviews). Effectively framing incentives for health behaviors may reduce the cost of achieving organizations' or employers' desired goals.

Our focus here is basic preventive health care. Preventive health screenings can detect problems early enough to maximize treatment effectiveness, improving health quality and reducing mortality (Maciosek et al., 2010). Given that preventive health care requires upfront outlays of money and time with future and uncertain benefits, myopic or liquidity-constrained individuals may tend to under-invest in it. A 2007 Robert Wood Johnson Foundation report examined twelve types of preventive health services and found that for seven services, fewer than half of recommended populations were receiving them (Partnership for Prevention, 2007). A 2015 Kaiser study suggests that 18 percent of individuals and about one-third of low-income individuals postponed preventive care in the past year due to cost (Kaiser, 2015). Preventive care has the potential to reduce societal healthcare costs, particularly when early treatment is available and affordable (Cohen et al., 2008). Policy-makers recognize this concern; a key feature of the 2010 Affordable Care Act is the reduction of patient cost-sharing for certain preventive services.

Prior research has documented low levels of preventive health service use among Arab/Chaldean-identifying residents of Michigan, a key demographic group in our sample. Perlstadt et al. (2015) document that 17.5 percent of Michigan Arab/Chaldean adults lack a regular healthcare provider and 33.2 percent had not received a check-up in the past year. These figures are higher than those for non-Hispanic White--identifying Michigan residents, a difference that is fully explained in a statistical sense by socioeconomic characteristics. A separate study of Arab-American ACCESS clients found that 51 percent of women over 40 with no history of breast cancer had not had a mammogram screening in the past two years (Ayyash et al., 2019). In our baseline sample, 17 percent said that no adult in their household had received preventive medical care in the past year.

4. Experimental design, data, and descriptive analyses

To investigate the link between loss framing and incentive take-up, we partnered with ACCESS, a non-profit organization in Dearborn, Michigan, that provides a range of social services and runs a health clinic. ACCESS was initially founded to serve the needs of the growing Arab immigrant community in metro Detroit 50 years ago, and it since has grown to become the largest Arab American community non-profit in the country. Today, it has a strong record of serving low-income families of all races and ethnicities in the metro Detroit area. Roughly half of its clients are Arab American (56 percent), and the remainder are primarily African American (19 percent) or White (16 percent). More than half of its clients have a household income of $20,000 or less (ACCESS, 2018). About 80 percent of those we surveyed were familiar with ACCESS at baseline, and 43 percent of the sample had previously used ACCESS's services.

We worked with ACCESS to implement a randomized field experiment using door-to-door surveys. We surveyed 2004 individuals in three waves from 2013 through 2015, with the exact methodology varying slightly between each wave as we responded to challenges in the field. The first wave was implemented from July through September 2013 and included 652 respondents. The second wave was implemented from October 2013 through August 2014, with a break during the winter months, and included 557 respondents. The final wave was implemented from May through October 2015 and included 795 respondents.

4.1. Survey area selection

To ensure that participants would be likely to use and benefit from ACCESS's preventive services, we targeted neighborhoods for our door-to-door survey that were (1) near ACCESS and (2) fairly low-income. Specifically, we used 2017–2011 American Community Survey 5-Year Estimates to identify Census tracts (geographic areas designed to approximate neighborhoods) within a 7-km (4.3-mile) radius originating at the partner clinic (90 tracts).[1] This included neighborhoods in Dearborn and Detroit. We then excluded tracts in which fewer than 20 percent of individuals had an annual income below the federal poverty line (13 tracts), and we randomized the order of surveying tracts. We sampled tracts in order by approaching every home in the tract once and then moving on to the next tract until we reached our target of 2000 households.

During our first survey wave, we encountered several safety issues: some interviewers were harassed by residents; on another day, interviewers witnessed gunfire a few blocks away. After these experiences, we excluded tracts that reported relatively high recent crime levels, and we contacted the Dearborn police department to exclude any additional tracts that they considered to be unsafe. We surveyed a total of 21 tracts over three years and randomized interventions at the household level, controlling for tract fixed effects in the analysis.

The sample areas had large immigrant populations, primarily from the Middle East. All interviewers were fluent in English and Arabic, and we surveyed respondents in whichever of the two languages they were most comfortable. English speakers received intervention materials only in English, while Arabic speakers received materials in English and Arabic.[2] To convey legitimacy while reducing bias in answering questions about trust in ACCESS and preventive health care usage, interviewers identified themselves as representatives of the University of Michigan and did not mention a partnership with ACCESS until sharing the intervention materials after the survey.

4.2. Recruitment and baseline survey

Pairs of interviewers approached all households that were located within each tract, skipping only houses that were vacant or that had

[1] The 2013 and 2014 waves were restricted to 30 tracts within 4km (2.5mi) of ACCESS, of which 29 had at least 20 percent of individuals earning less than the federal poverty line. In 2015, we surveyed among tracts that were between 4 and 7 km from ACCESS.

[2] Among households we visited, fewer than one percent could not participate in the survey because the potential respondent spoke neither English nor Arabic.

Table 1
Demographic characteristics of $50 incentive respondents by sample wave.

	Wave Overall (1)	2013 (2)	2014 (3)	2015 (4)
Female	0.57	0.59	0.59	0.55
Age	37.46	36.70	37.14	37.98
Married	0.57	0.52	0.58	0.59
Arabic speaking	0.30	0.30	0.34	0.26
Middle Eastern[a]	0.69	N/A	0.79	0.62
Black	0.14	0.25	0.12	0.10
Hispanic	0.03	0.03	0.01	0.04
Number of children	4.36	4.10	4.63	4.29
Household size	1.66	1.50	1.81	1.61
Born in US	0.48	0.49	0.43	0.50
US citizen	0.87	0.85	0.86	0.89
HS graduate or less[b]	0.46	N/A	N/A	0.46
Quality of health (1 = excellent, 6 = very poor)	2.65	2.64	2.62	2.67
Preventive health visits per capita past 12 mo, adults	1.57	0.99	1.64	1.76
Preventive health visits per capita past 12 mo, children[c]	1.85	1.14	1.83	2.16
Know about ACCESS	0.80	0.82	0.90	0.71
Ever used ACCESS	0.43	0.48	0.46	0.38
Trust ACCESS (agree/strongly agree)	0.36	0.41	0.38	0.33
Loss aversion (Kőszegi-Rabin)	1.78	1.45	1.76	1.94
Digit span	6.05	6.23	5.97	6.03
Raven's matrices (out of 3)	1.23	0.93	1.43	1.25
Have any health insurance	0.81	0.71	0.78	0.88
Have health insurance through employer or spouse	0.32	0.28	0.26	0.37
Have public health insurance	0.44	0.34	0.47	0.45
Emergency health visits per capita past 12 mo, adults	0.59	0.73	0.56	0.55
Emergency health visits per capita past 12 mo, children[c]	0.48	0.59	0.49	0.43
Non-emergency health visits per capita past 12 mo, adults	1.53	1.10	1.96	1.42
Non-emergency health visits per capita past 12 mo, children[c]	1.73	1.33	1.91	1.76
Observations	1678	326	557	795

[a] Only asked in 2014 and 2015 wave.
[b] Only asked in 2015 wave.
[c] Restricted to households with children.

posted "no solicitation" signs. To maximize the likelihood of reaching respondents, interviewers surveyed in evenings and on weekends. When respondents came to the door, interviewers invited them to participate in a brief survey about preventive health care usage. Interviewers offered a small bottle of hand sanitizer as a thank-you gift, but they did not mention the likelihood of receiving incentives to visit ACCESS.

Thirteen percent of addresses were deemed unapproachable because of no solicitation signs, obvious vacancies, or other factors. Of the remaining 87 percent of addresses, 36 percent of residents answered their doors, 88 percent of those met the eligibility criteria—being between ages 18 and 64 and an English or Arabic speaker—and 46 percent of those eligible agreed to participate. Participating households represented 12 percent of all addresses in the chosen tracts, reducing concerns of within-tract spillovers.

Participants completed a brief baseline survey about their demographic characteristics, healthcare utilization, and trust and knowledge of ACCESS. The final questions measured their loss aversion (non-incentivized) and cognitive ability through Raven's matrices and number recall.

4.3. Sample characteristics

The sample described in Table 1 is 57 percent female and 57 percent married, with just under half born in the United States. About 81 percent of respondents have some form of health insurance. Eighty percent were familiar with our partner, ACCESS, and 43 percent had visited it before. Additional control variables include measures of health status, use of medical care, and cognitive ability.[3] We also include measures of trust and loss aversion, described below.

Table 1 also shows how the sample characteristics differ by each survey wave. All regression analyses control for survey wave, and preferred specifications also include survey language, enumerator, survey day-of-week, survey month, and Census tract fixed effects.

4.4. Measuring loss aversion

To measure loss aversion, we use a simple lottery choice task adapted from Fehr and Goette (2007), similar to approaches commonly used in the literature. We ask series of eight hypothetical (i.e. non-incentivized) questions about their willingness to accept a risky opportunity of the form: "Suppose that you can choose to pursue an opportunity where half of the time you could instantly earn a profit of $10 and the other half of the time you could instantly lose $X."[4] The values of X ranged from a loss $12 to a gain of $2, and we measure the minimum acceptable opportunity when respondents switched between rejecting and accepting the opportunity. Because the order in which respondents answer these questions may influence their switch point, we randomized whether questions started with the most favorable or least favorable opportunity and we control for the order of these questions in our empirical specifications.

As argued in Segal and Spivak (1990), Rabin (2000), Rabin and Thaler (2001), Wakker (2005), Köbberling & Wakker, 2005, Fehr and Goette (2007), and Gächter, Johnson and Herrmann (2007), our lottery task measures loss aversion rather than risk aversion. Segal and Spivak (1990) show that risk aversion over sufficiently small-stakes lotteries is more appropriately considered "loss aversion" (see Masatlioglu & Raymond, 2016). We therefore interpret unwillingness to risk a loss in a low-stakes lottery with positive expected value as evidence of loss aversion.

An individual will accept a risky opportunity if her expected utility from the lottery is greater than zero, taking into account any asymmetric preferences with respect to losses and gains. Based on switch points in answers to the series of lottery questions, we calculate individual-specific loss aversion coefficients following Kőszegi & Rabin, 2006 model of reference-dependent utility. We assume a linear utility function with a loss-aversion coefficient λ described earlier, in which a person has

[3] We measure respondents' cognitive ability in two ways. First, we used digit-span sequencing to measure working memory, asking respondents to recite back strings of numbers of increasing length. On average, respondents could recall six numbers sequentially without errors. Second, we use Raven's matrices to measure fluid intelligence. We show respondents a series of three pieces that form a pattern, with a fourth piece missing. We ask them to select from four choices the best fit for that missing piece. On average, respondents scored 1.2 correct out of 3 questions of increasing difficulty. We normalize and then control for cognitive ability in our specifications that use individual-level covariates.

[4] A meta-analysis by Brown et al. (2022) finds that the distribution of estimated loss-aversion coefficients is similar between incentivized and non-incentivized measures. Although these questions are typically worded as a gamble, we adjusted the wording to be an "opportunity" after pilot testing revealed many subjects rejected all gambles because of religious objections to gambling.

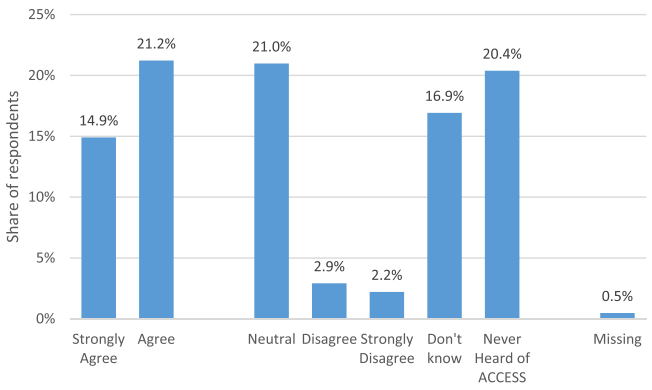

Fig. 1. Distribution of trust of ACCESS.
Notes: Distribution of trust in the sample ($N = 1678$) of $50 incentive recipients. We refer to "trusters" as those who strongly agree or agree with the statement that individuals working at ACCESS can be trusted. "Non-trusters" were neutral, disagree, strongly disagree, answered "don't know," or were not asked the question because they had never heard of ACCESS. Most "non-trusters" have a neutral opinion about ACCESS rather than actively distrusting the organization.

utility $u(a) = a$ if $a > 0$ and $u(a) = \lambda a$ if $a \leq 0$. As in KR, we assume that each lottery is the reference point.[5] We obtain loss aversion measures for 1497 participants (89 percent) who received reminders or gift cards worth $50.

Individuals who accept all opportunities have a KR loss-aversion coefficient less than 1 (29 percent of respondents), suggesting they are gain-seeking (also sometimes called loss-loving). This share is comparable to other lab studies that find a range of 12 to 29 percent but lower than the 53 percent that Chapman et al. (2018) found using a representative sample of the U.S. population.[6] Individuals who reject all eight opportunities have a coefficient greater than 3 (19 percent of respondents). The mean loss aversion coefficient is 1.78 and the median is 1.86, which is in the range of someone who would reject the opportunity of a 50 percent chance to win $10 if the loss is $4 but accept it if the loss is $2. The figures are well in the range of loss aversion estimates across other lab studies, ranging from 1.5 to 2.5 (Chapman et al., 2018). A recent meta-analysis of loss aversion studies reported a median of reported loss aversion across studies of 1.69 and a mean of 1.97 (Brown et al., 2022). We incorporate loss aversion into our main empirical specifications with a continuous measure of the KR loss-aversion coefficient.

4.5. Measuring trust

To understand the role of trust, we also asked about trust in ACCESS. About 80 percent of sample respondents said they had heard of our community partner, ACCESS. For those who indicated they had heard of ACCESS, we asked respondents to use a five-point Likert scale to report how much they agree with the following statement: "Individuals working at ACCESS can be trusted."

Fig. 1 shows the distribution of responses across the sample of respondents. Of the total sample, 36 percent said they agreed or strongly agreed with the statement. Twenty-one percent of the sample said they were neutral, and 5 percent disagreed or strongly disagreed. The remainder said they did not know (17 percent), did not answer (less than 1 percent), or were not asked the question because they had not heard of ACCESS (20 percent). In other words, the bulk of those who did not agree or strongly agree with the trust statement were individuals who had not heard of or had no firm opinion about trusting ACCESS.

It is possible that trust in ACCESS might be correlated with other indicators of trust. For example, if respondents are mistrustful more generally, they might not visit the doctor for fear that doctors cannot be trusted. To distinguish between trust in the organization versus a general lack of trust, we asked two additional questions about trust, which we explore later: (1) "Generally speaking, do you believe that most people can be trusted, or can you never be too careful in dealing with people?" and (2) "Generally speaking, do you believe that medical professionals can be trusted, or can you never be too careful in dealing with medical professionals?" Overall, 67 percent say they trust people generally, and 45 percent say they trust medical professionals.

4.6. Loss aversion and trust

As described above, we are particularly interested in the effect of loss aversion and baseline trust in ACCESS as potential mediators. Unlike the assignment to the loss frame or gain frame, these individual characteristics are not randomly assigned. To illustrate the determinants of these key variables, Table 3 shows which factors predict baseline levels of loss aversion (columns (1) and (2), measured continuously) and trust (columns (3) and (4), measured as a binary variable).

The second column of Table 3 is the preferred specification predicting loss aversion, using KR loss aversion coefficients continuously. As described above, loss aversion is estimated from a series of questions about willingness to enter a risky venture with uncertain outcomes. After controlling for Census tract and other factors, women and married individuals are somewhat more loss-averse in the sample. Those with higher Raven's scores were also slightly more loss-averse on average. This is consistent with Chapman et al. (2018) who find a positive association between cognitive ability and loss aversion in a sample representative of the U.S. population.[7]

In the last columns of Table 2, we investigate the predictors of baseline trust in our partner organization. Here we define "trusters" as those who strongly agreed or agreed with the trust statement, and other "non-trusters" as those who were neutral, disagreed, strongly disagreed, did not know, or had never heard of ACCESS. Note that most respondents in the "non-truster" group were neutral, did not know how to answer, or were not asked the question because they had never heard of ACCESS, as opposed to actively distrusting the organization. The final column with fixed effects indicates that Arabic speakers are much more likely to trust ACCESS. Additionally, women, married individuals, and those who are not self-insured are more likely to trust ACCESS. In Appendix Table 5, we provide evidence that these other factors correlated with trust are not responsible for the differential effect of loss- versus gain-framed incentives among the more and less trusting.

[5] For example, we can bound the loss aversion coefficient for a person who accepts "win $10, lose $6" but rejects "win $10, lose $8." Her expected utility of $g = \$10$ and $l = -\$8$ is $0.5g + 0.5l + 0.25u(g - l) + 0.25u(l - g) = 0.5 * 10 - 0.5 * 8 + 0.25u(10 - (-8)) + 0.25u(-8 - 10)$. As she rejects it, we know her utility is less than zero. That is, $\lambda > 1.22$. Because the person accepts $g = \$10$ and $l = -\$6$, we can determine that $\lambda < 1.5$. In our calculations, we use the *minimum* loss aversion coefficient based on respondent rejections. We also calculate loss aversion following Tversky and Kahneman (1992), and we find no qualitative difference in the results, which Appendix Table 6 shows.

[6] These studies, compiled and highlighted by Chapman et al. (2018), are Schmidt and Traub (2002); Brooks and Zank (2005); Abdellaoui et al. (2007, 2008); Sokol-Hessner et al. (2009); Abdellaoui et al. (2011); Sprenger (2015); and Goette et al. (2018).

[7] Chapman et al. (2018) investigate other correlates of loss aversion as well. We find, as they do, that age and being non-white is negatively associated with loss aversion. Some of our correlations are different than theirs: they find that education is positively correlated with loss aversion, while we find no strong relationship with being a HS graduate, and they do not find a significant association with marital status. We find that women are more loss averse in our sample, while they find that men are. The literature on gender differences in loss aversion is mixed (Bouchouicha et al., 2019.)

4.7. Interventions and randomization

There were initially four treatment arms in the study: a $10 reminder card, a $50 reminder card, a $10 Visa gift card, and a $50 Visa gift card. We chose $50 as a benchmark because it matched the cost of a basic health screening for uninsured participants. We also incorporated a $10 arm to evaluate the impacts of a lower-powered incentive. The $10 treatments had low take-up and were eliminated after the first wave. For most of the analysis below, we focus on the sample that received the $50 incentives, and therefore we use this sub-sample in the Table 1 summary statistics.

The exact interventions varied across the three survey waves.[8] The two treatment arms of interest here are a $50 gain frame treatment arm, which provided participants with a reminder card that respondents could redeem for a $50 Visa gift card if they visited the ACCESS clinic, and a $50 loss frame treatment arm, a Visa gift card worth $10 that respondents could activate by visiting the ACCESS clinic. We focus on the $50 loss and gain frame treatments because the two comparable $10 treatment arms were eliminated after the first wave. Results including the $10 treatment arms are shown in Fig. 6, with more details available in Appendix Table 1.

At the end of the baseline survey, the interviewer opened and talked through the contents of the information packet with the respondent and give the respondent the envelope contents to keep. Respondents who completed the surveys in English received an English-only packet, and respondents who completed the survey in Arabic received a packet with English and Arabic versions of the contents. The letters and informational flyers detailing the Visa gift card or reminder card offer used the ACCESS clinic letterhead. (See the online appendix for English-language versions of all treatment materials used in 2015; these were only marginally changed from early waves.) The envelope contents were blind to the interviewer prior to opening it after the baseline survey, and treatment assignment was stratified by interviewer and census tract determined randomly within each interviewer and tract.

The loss-framed (Visa gift card) and gain-framed (reminder) treatments were designed to look and feel as similar as possible, except that the loss-framed gift card included the Visa logo and a 16-digit card number. A sticker on both cards reminded the recipient about the redemption deadline. In the second and third experiment waves, recipients also received a reminder call roughly two weeks after the baseline survey. Appendix Fig. 1 shows examples of the Visa gift card and reminder card.

Each incentive offer came with three additional pieces of information: a flyer about ACCESS and its location, a price list for common preventive health services available at the ACCESS clinic, and a flyer advertising a comprehensive recommended preventive health screening for adults, which was packaged at $50 for those without insurance.

Recipients in both treatment arms had 30 days from the time of the survey to bring their reminder or gift card to ACCESS and obtain a preventive health service, and this date was noted with a sticker on the reminder or gift card. To mitigate potential salience differences between those with the reminder and the gift card, we also called respondents to remind them of the upcoming deadline in the second and third waves. We also ensured the cards had the same color, shape, and general appearance, with the exception of the Visa logo.

We randomized at the individual level, and the treatment was blind to the enumerator until after the respondent completed the baseline survey, when he or she opened the sealed intervention envelope. We stratified our randomization by enumerator and language of the respondent. We test for balance across treatment arms, as shown in Table 3. We do see some evidence of imbalance for a few covariates, as Visa gift card recipients are less likely to be female and more likely to

Table 2
Determinants of trust and loss aversion.

	Loss aversion, KR Rabin		Trust ACCESS	
	(1)	(2)	(3)	(4)
Female	0.102*	0.099*	0.056**	0.058**
	[0.059]	[0.060]	[0.023]	[0.023]
Age	−0.046	−0.080	0.096***	0.081***
	[0.072]	[0.074]	[0.028]	[0.028]
Married	0.484***	0.454***	0.093***	0.086**
	[0.085]	[0.087]	[0.035]	[0.035]
Arabic speaking	0.005	0.173	0.127***	0.188***
	[0.093]	[0.108]	[0.034]	[0.039]
Middle eastern	0.040	0.135	−0.096***	−0.024
	[0.096]	[0.124]	[0.034]	[0.043]
Black	−0.103	−0.036	−0.093*	−0.016
	[0.166]	[0.174]	[0.053]	[0.057]
Hispanic	0.045	0.050	−0.003	0.003
	[0.036]	[0.036]	[0.014]	[0.014]
Number of children	0.006	0.001	0.017*	0.011
	[0.023]	[0.023]	[0.009]	[0.009]
Household size	−0.017	−0.004	−0.034	−0.025
	[0.077]	[0.080]	[0.032]	[0.032]
Born in US	0.055	0.055	0.013	0.007
	[0.099]	[0.099]	[0.041]	[0.041]
US citizen	0.025	0.042	0.010	−0.002
	[0.098]	[0.104]	[0.034]	[0.035]
High school graduate or less	−0.018	−0.006	0.005	0.010
	[0.028]	[0.028]	[0.010]	[0.010]
Quality of health (1 = excellent, 6 = very poor)	0.018	0.014	0.008*	0.007
	[0.011]	[0.012]	[0.005]	[0.005]
# Preventive health visits past 12 mo, adults	0.002	0.006	−0.004	−0.005
	[0.022]	[0.022]	[0.004]	[0.004]
# Preventive health visits past 12 mo, children	0.002	0.002	0.001	0.002*
	[0.003]	[0.003]	[0.001]	[0.001]
Insured, employer/spouse	−0.055	−0.082	−0.045	−0.048
	[0.089]	[0.091]	[0.036]	[0.036]
Insured, public	−0.095	−0.073	−0.002	−0.004
	[0.082]	[0.082]	[0.034]	[0.034]
Insured, self-purchased	−0.215	−0.218	−0.110*	−0.131**
	[0.140]	[0.148]	[0.056]	[0.056]
Raven's index score, normalized	0.075**	0.070**	−0.020	−0.016
	[0.032]	[0.033]	[0.013]	[0.013]
Number recall score, normalized	−0.043	−0.061*	0.015	0.009
	[0.033]	[0.035]	[0.013]	[0.013]
Observations	1497	1497	1670	1670
R-squared	0.441	0.465	0.137	0.191
Enumerator, survey month, day-of-week, tract FE		X		X

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Missing values coded as zero, with missing flags included but not reported. Wave fixed effects included in all specifications. Controls for any other insurance, per capita emergency health visits (adults and children), per capita non-emergency health visits (adults and children), and order of loss-aversion questions included but not reported. Middle Eastern ethnicity question asked only in 2014 and 2015, and education asked only in 2015. OLS regression; robust standard errors reported in brackets.

[8] In Wave 1 (2013), we had four treatment arms. These were: (a) $10 reminder: A reminder card that respondents could redeem for a $10 Visa gift card if they visited the ACCESS clinic within 30 days; (b) $50 reminder card: Same as (a), but the Visa gift card was worth $50; (c)$10 gift card: A Visa gift card worth $10 that respondents could activate by visiting the ACCESS clinic within 30 days; and (d) $50 gift card: Same as (c), but the Visa gift card was worth $50. In Wave 2 (2014), due to low take-up of the $10 treatments (a) and (c), we restricted our treatments to (b) and (d). We also added a reminder phone call for all participants. In Wave 3 (2015), we include treatments (b) and (d), but members of both groups also received general health information about the importance of preventive health care. We issued a reminder phone call for all participants. We added two new intervention groups in our 2015 wave: a control group and an information-only group. Because this paper focuses on effects of monetary incentives, we exclude both groups from the analysis presented here.

Table 3
Demographic characteristics and balance tests.

	$50 Gain frame (Reminder card)	$50 Loss frame (Visa Gift card)	Joint equality of means, p-value
	(1)	(2)	(3)
Female	0.60	0.55	0.028**
Age	37.36	37.55	0.692
Married	0.58	0.57	0.685
Middle Eastern	0.68	0.69	0.312
Black	0.13	0.14	0.907
Hispanic	0.03	0.03	0.696
Number of children	4.43	4.30	0.192
Household size	1.71	1.60	0.166
Born in US	0.47	0.49	0.446
US citizen	0.86	0.89	0.194
HS graduate or less	0.46	0.45	0.776
Quality of health (1 = excellent, 6 = very poor)	2.60	2.69	0.104
Preventive health visits per capita past 12 mo, adults	1.57	1.58	0.881
Preventive health visits per capita past 12 mo, children	1.82	1.88	0.603
Know about ACCESS	0.80	0.79	0.942
Ever used ACCESS	0.45	0.40	0.152
Trust ACCESS (agree/strongly agree)	0.38	0.35	0.316
Loss aversion (Kőszegi-Rabin)	1.78	1.79	0.980
Digit span	6.03	6.06	0.830
Raven's matrices (out of 3)	1.24	1.23	0.622
Have health insurance through employer or spouse	0.29	0.34	0.067*
Have public health insurance	0.46	0.41	0.055*
Have self-purchased health insurance	0.05	0.06	0.386
Have some other health insurance	0.00	0.01	0.566
Emergency health visits per capita past 12 mo, adults	0.62	0.56	0.332
Emergency health visits per capita past 12 mo, children	0.47	0.50	0.570
Non-emerg. health visits per capita past 12 mo, adults	1.61	1.46	0.285
Non-emerg. health visits per capita past 12 mo, children	1.80	1.64	0.321
Direction of risk aversion questions	0.46	0.51	0.078*
Observations	843	835	
Jointly predict treatment, SUR p-value		0.061*	

* $p < 0.10$, ** $p< 0.05$, *** $p<0.01$. All tests include survey language, wave, enumerator, month-year, and day-of-week fixed effects and report robust standard errors. Middle Eastern ethnicity question asked only in 2014 and 2015, and education asked only in 2015. Digit span and raven's matrices normalized in regressions. Joint balance p-value is based on a chi-squared statistic from seemingly unrelated regressions for each covariate and its associated missing variable flag, with controls for fixed effects.

have private health insurance. The direction of the loss aversion questions (from the least risky to most risky gamble, or vice versa) is also marginally statistically significant. As a result, we can reject the null hypothesis that the set of covariates are equal between treatment and control groups at the ten percent level. We note, however, that it is unlikely that interviewers would have been able to manipulate treatment assignment, and we believe these differences are the result of chance.

Our main regression specifications control for all Table 3 covariates, except for measures of ACCESS knowledge, usage and trust, and measures of loss aversion. All analyses use ordinary least square regressions.

4.8. Outcomes

While we aimed to incentivize healthcare utilization, the incentive was tied to a visit to the ACCESS health clinic rather than utilization *per se*. The clinic offered basic preventive screening (such as a blood pressure check) for as little as $5 out-of-pocket for an uninsured person, and roughly four-fifths of our sample had insurance and would have faced little or no out-of-pocket expense for preventive care. A health screening package was priced at $50, the highest value of incentive offered. In practice, most individuals chose to make an appointment without receiving any immediate service, or they obtained a minimal preventive service at little or no cost. Thus, most participants who visited the clinic used the incentive payment elsewhere, presumably for non-health-related consumption. We do not observe overall health service utilization and therefore do not evaluate whether the incentive may have crowded out other health care or crowded in health care by connecting participants to a provider.

Instead, we report results for the effectiveness of loss versus gain framing for a particular measurable behavior – visiting the health clinic, which we refer to as "take-up." This is an imperfect proxy for preventive health care received, but nevertheless, it allows us to examine the decision-making processes associated with different experimental arms. We have administrative information from ACCESS on whether participants visited, so there is no attrition for the outcome of interest.

5. Stylized model

In this section, we provide a stylized theoretical model to describe the take-up behavior of study participants who vary in their loss aversion and perceived trust in the incentive. Let m denote the amount of the monetary incentive provided to subjects to visit a health clinic. This monetary incentive could take two different forms: (i) loss frame: an inactive Visa-branded gift card (g), or (ii) gain frame: a reminder card (r) similar in size and color. The two cards are pictured in Appendix Fig. 1. To redeem either incentive, each subject must travel to the health clinic. For simplicity, we assume c represents the total net cost of visiting the clinic, including time and transportation costs. Because treatment is randomly assigned, we assume the distribution of costs is similar across different treatments. The treatment (loss versus gain frame) might have two distinct effects. The first one is to change the sense of ownership of the incentive and the second is to affect the subjective belief that the participant will receive the incentive payment if they visit the clinic (trust).

Even though the subject does not receive the monetary incentive before going to the clinic, participants' feelings of ownership might be affected differentially by the loss- and gain-framed incentives. It has been shown that subjective feelings of ownership play an important role in explaining behavior (Strahilevitz & Loewenstein, 1998; Reb & Connolly, 2007; Nash & Rosenthal, 2014). The feeling of ownership shifts participants' reference points, resulting in an increased take-up rate among loss-averse individuals.

To model the sense of ownership, we introduce the parameter p, which measures the probability that participants incorporate the incentive payment into their reference point. The parameter p might depend on whether the subject receives a loss- or gain-framed incentive. Once subjects incorporate the incentive amount into their reference point, the failure to obtain it will be perceived as a loss. If the participant does not have a sense of ownership over the incentive (i.e., no change in their reference point), the incentive will be perceived as a gain. For simplicity, we treat perceived ownership of the incentive as binary at the

Reference point	"Do nothing"	"Go to clinic"
Does not shift reference point $(1-p)$	$(0-0)-0$ =0	$(m\tau-0)-c$ $= m\tau - c$
Shifts reference point (p)	$\lambda(0-m\tau)-0$ = $-\lambda(m\tau)$	$(m\tau-m\tau)-c$ = $-c$

Fig. 2. Theoretical decision parameters.
Notes: The decision rule depends on whether the individual incorporates the incentive into the reference point, which occurs with probability p. If not, the individual compares the expected gain of the incentive $m\tau$ (the value of the incentive m times the perceived probability that it will be provided τ) with the cost of going to the clinic c. If the reference point is shifted, the expected loss $m\tau$ is multiplied by a loss aversion term $\lambda \geq 1$ if the individual does not go to the clinic, making the choice to go to the clinic (weakly) more attractive relative to the case without a reference point shift.

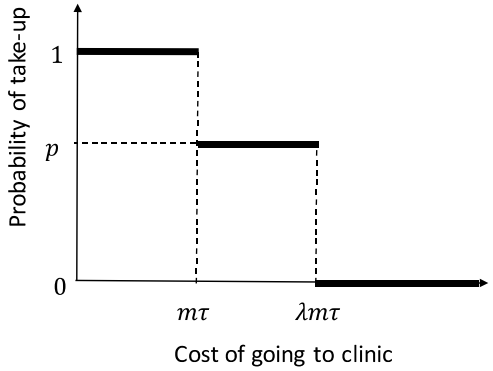

Fig. 3. Relationship between parameters and take-up.
Notes: The probability of going to the clinic for a low-cost individual is one. People with very high costs do not go to the clinic. And only a fraction of the middle group goes to the clinic. Conditional on the cost distribution, the size of the middle group depends on the size of the incentive m, the loss aversion parameter λ, and the degree to which individuals believe the incentive will be provided, τ. The probability of take-up in the middle group is determined by the fraction of individuals p who have a sense of ownership over the incentive.

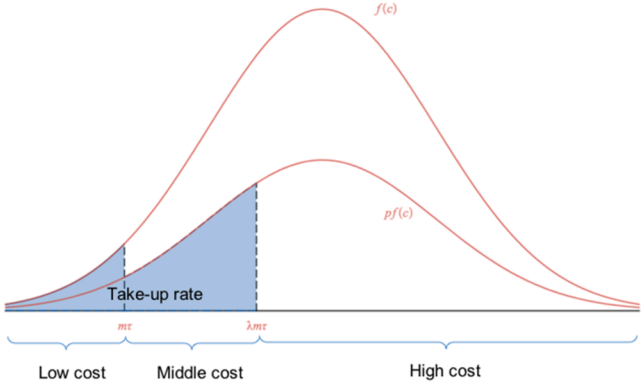

Fig. 4. Schematic representation of the decision to visit clinic.
Notes: The shaded area under the curve represents the take-up rate in each range of the cost distribution $f(c)$. People with very low costs always go to the clinic. Similarly, people with very high costs never go to the clinic. The size of the low, middle, and high-cost groups depends on the incentive m, the subjective probability that the incentive will be received, τ, and the loss aversion parameter λ. In the middle-cost group, individuals participate only if they have a sense of ownership over the incentive, which occurs with probability p.

individual level, with p representing the fraction of individuals with a sense of ownership over the incentive.

We model the reference-dependent preferences following Tversky and Kahneman (1991). Individuals have the following utility associated with some change a to their current perceived reference point:

$$u(a) = \begin{cases} a & if\ a \geq 0 \\ \lambda a & if\ a < 0 \end{cases}$$

Following Kahneman and Tversky (1984), we assume that some participants (the loss-averse) have utility functions that are steeper for losses than for gains. In other words, the psychological impact of a loss is greater than an equivalent gain and individuals are more sensitive to losses. Loss aversion is captured by a coefficient of $\lambda \geq 1$. Thus, the model predicts that a loss-averse individual will get more disutility from forfeiting a if she has a sense of ownership over a (i.e. she has incorporated a into her reference point) than she will get utility from gaining a if she does not perceive a to be part of her reference point.

We also introduce a new parameter τ that captures the subjective probability the participant assigns to receiving the promised payment. It is a measure of how much participants trust the organization to provide the incentive as promised. The value of this parameter lies between 0 and 1; if the participant trusts the organization at baseline, τ tends to be higher. The parameter τ might depend on whether the subject receives a Visa gift card or reminder. We expect that the loss frame, in which participants physically have a Visa-branded gift card, would be associated with a higher subjective probability of payout.

For a stylized model, let τ_{Hg} denote the parameter for people who highly trust our partner organization at baseline and receive the loss-framed Visa gift card, τ_{Hr} denote the parameter for those who highly trust the organization and receive the gain-framed reminder card, τ_{Lg} denote the parameter for people who do not trust our partner organization and receive the Visa gift card, and τ_{Lr} denote the parameter for those who do not trust the organization and receive the reminder card. Intuitively, we assume that the Visa gift card induces a higher subjective probability of receiving payment for each participant type, i.e., $\tau_{Hr} \leq \tau_{Hg}$ and $\tau_{Lr} \leq \tau_{Lg}$. Similarly, those with higher baseline trust will perceive a higher probability of payment from both types of incentives: $\tau_{Lg} \leq \tau_{Hg}$ and $\tau_{Lr} \leq \tau_{Hr}$. We also posit that the Visa gift card treatment is at least as impactful in inducing trust in the incentive for those who do not have a pre-existing trusting relationship with the organization. That is, $(\tau_{Hg} - \tau_{Hr}) \leq (\tau_{Lg} - \tau_{Lr})$. This is would be the case if participants who trust the organization are quite confident that any incentive will be provided as promised and therefore have a value of τ_{Hr} that is near one.

We now describe the take-up behavior for a subject with five parameters (m, c, p, λ, and τ). Each participant has two options: "do nothing" or "go to the clinic" to obtain the incentive payment. Whether the subject receives a loss- or gain-framed incentive potentially impacts both p, the probability of perceived ownership, and τ, the subjective probability that the incentive will be forthcoming. Both of our key treatment groups have an equivalent dollar value of the incentive, m, of $50. We measure loss aversion, λ, as well as baseline trust in the organization (a partial determinant of τ), both of which will mediate the take-up decision. The cost of visiting the clinic, c, is not measured but is

assumed to be equally distributed across treatment groups.

With probability p, the participant believes that she has a sense of ownership over the incentive and her reference point adjusts to incorporate it. Based on the reference point, the participant makes a choice based on her expected gain, expected loss, and cost. With the "do nothing" option, she expects to lose $m\tau$ (loss domain), where m is the dollar amount of the incentive and τ is the subjective probability that the payment would have been received. The utility loss associated with this is $-\lambda m\tau$, where λ is the degree of loss aversion. With the "go to clinic" option, she expects to pay cost c and face no other change in utility relative to the reference point.

On the other hand, if the participant does not have a feeling of ownership over the incentive payment, then there is no change in her reference point. In this case, "do nothing" corresponds to no change in utility. However, "go to clinic" will provide a total utility of $m\tau - c$ (gain domain). These parameters are summarized below in Fig. 2.

Assume for the moment that $\lambda \geq 1$, implying that participants are loss averse or loss neutral. If the net cost is sufficiently low $(c < m\tau)$, the participants will go to the clinic. Similarly, if the cost is sufficiently high $(c > \lambda m\tau)$, participants will not go to the clinic regardless of the reference point. When the cost lies in the middle range $(m\tau < c < \lambda m\tau)$, the sense of ownership affects whether the participant will go to the clinic. Fig. 3 illustrates that, conditional on a given $\lambda > 1$, there are three groups: very low-cost participants who go to the clinic, very high-cost participants who do not go to the clinic, and middle-cost participants who go to the clinic if they feel ownership over the incentive. The size of the middle-cost group depends on the degree of loss aversion λ, the size of the incentive m, and the perceived probability the incentive will be provided τ. For loss-neutral participants ($\lambda = 1$) the "middle cost" group does not exist.

We assume that subjects are heterogeneous with respect to the cost they face. Let $f(c)$ represent the probability density function (pdf) of cost parameter c. To find out the total take-up rate, we calculate the area under the curve shown in Fig. 4. While all subjects in the low group go to the clinic, only a fraction of subjects in the middle group visits the clinic. That is,

$$\text{Take}-\text{up Rate (TR)} = \int_0^{m\tau} f(c)dc + \int_{m\tau}^{\lambda m\tau} pf(c)dc = (1-p)F(m\tau) + pF(\lambda m\tau).$$

Armed with this basic stylized model, we now investigate the effects of trust, ownership, and loss aversion on the take-up rate, respectively.

A higher subjective probability τ that the incentive payment will be delivered is associated with higher take-up. As can be seen in Fig. 5 panel (a), increasing τ moves both cut-offs to the right, meaning more participants will visit the clinic. If participants believe the incentive payment will materialize, some who were not willing to bear the travel cost will now do so. Hence, the take-up rate increases as the level of trust increases. Mathematically,

$$\frac{\partial \text{TR}}{\partial \tau} = (1-p)mf(m\tau) + p\lambda mf(\lambda m\tau) > 0.$$

When the probability of perceived ownership p increases, loss-averse participants will be more likely to respond to the incentive, as shown in (b). Formally, we have:

$$\frac{\partial \text{TR}}{\partial p} = \int_{m\tau}^{\lambda m\tau} f(c)dc > 0 \text{ if } \lambda > 1 \text{ and } \tau > 0.$$

Finally, a higher loss aversion also yields a higher take-up rate. The group with a shifted reference point will be more responsive if they are more loss averse. That is:

$$\frac{\partial \text{TR}}{\partial \lambda} = pm\tau f(\lambda m\tau) > 0 \text{ if } p,\ \tau > 0\ .$$

Notice that when p is zero, so is the effect of loss aversion. In other words, if one cannot induce a sense of ownership, loss aversion has no effect on behavior. This is shown in (c).

The stylized model yields the following predictions that can be tested empirically:

1 The take-up rate increases as the loss aversion coefficient increases, if there is a positive sense of ownership. Similarly, the take-up rate increases as the probability of the sense of ownership increases, but only if the participant is loss averse. We assume the loss-framed incentive (Visa gift card) is more likely to induce "ownership" than the gain-framed incentive (reminder card) $(p_r \leq p_g)$.

Hypothesis 1a. (evaluated *within* each treatment): Participants who exhibit higher loss aversion will have higher take-up rates in each treatment.

Hypothesis 1b. (comparison *between* treatments): If Hypothesis 1a holds, loss-averse individuals will be more responsive to the loss-framed incentive (Visa gift card) than the gain-framed incentive (reminder card).

If these hypotheses are validated empirically, the findings lend support to the notion that the Visa gift card induced higher responsiveness to the loss frame due to loss aversion.

2 The model suggests that the take-up rate increases as the level of subjective probability of payment increases. We hypothesize that those who have a high degree of trust in our partner organization at baseline are likely to perceive a higher likelihood of payment from

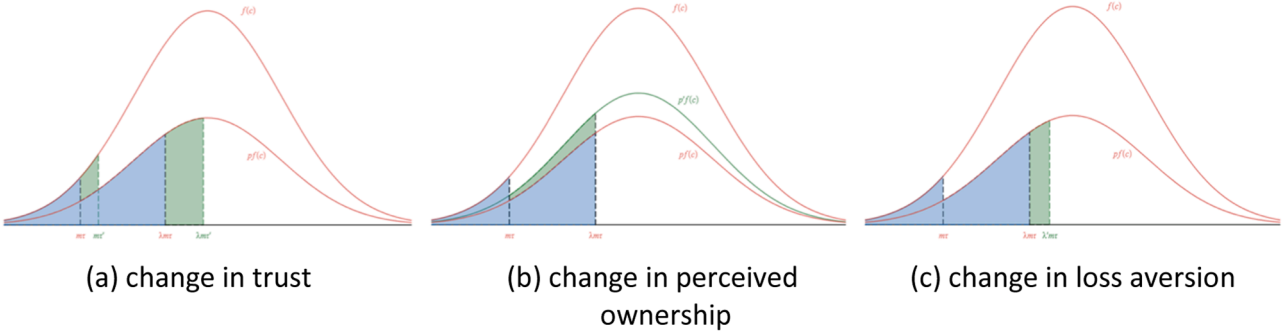

Fig. 5. Comparative statics on take-up rates.
Notes: The shaded area under the curve represents the take-up rate in each range of the cost distribution *f(c)*. In each panel, the green area indicates the amount of increase in the take-up rate after the corresponding change. In panel (a), both cutoffs move to the right when trust is increased, indicating that more people are willing to go to the clinic since the perceived gain is higher. In panel (b), an increase in the sense of ownership increases the take-up rate among the middle-cost group. Finally, in panel (c), the effect of loss aversion is strictly positive if the sense of ownership is not zero.

both the loss- and gain-framed incentives than those who do not. We also believe that the loss-framed incentive (Visa gift card) is associated with a higher perceived probability of payment relative to the reminder card, and we expect that this effect is larger among those who do not have an existing trusting relationship with the organization at baseline.

Hypothesis 2a. (evaluated *within* each treatment): Participants who trust the partner organization at baseline will have higher take-up rates.

Hypothesis 2b. (comparison *between* treatments): "Non-trusters" will be more responsive to the loss-framed incentive (Visa gift card) than the gain-framed incentive (reminder card), and the gap will be greater for those without trust at baseline than for those who do trust the organization at baseline.

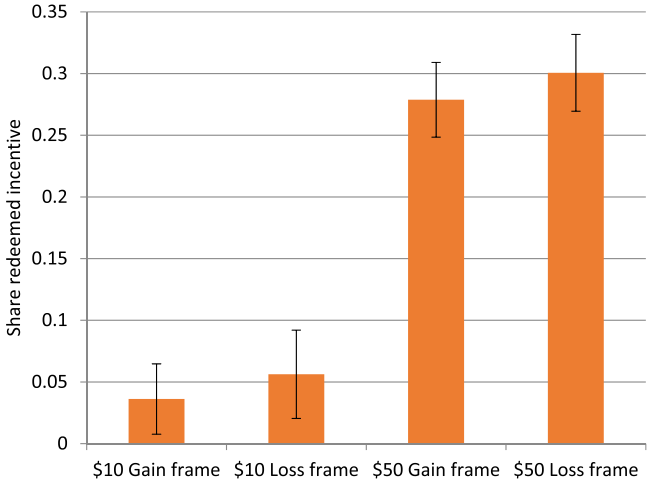

Fig. 6. Unadjusted take-up rates by treatment arm.
Notes: Unadjusted take-up rates for the four treatment arms. Take-up of the $10 incentive to go to the health clinic, regardless of the framing, was very low. 25–30 percent of respondents receiving $50 incentives went to the clinic. The difference between the $50 loss frame (gift card) treatment and the $50 gain frame (reminder card) treatment is not statistically significant in the raw data shown here, but it is significant after including controls.

6. Results

6.1. Unadjusted results

We first show the unadjusted take-up rates for those receiving the loss-framed (Visa gift card) versus gain-framed (reminder card) incentive. Although we focus on the $50 treatments, we show both $10 and $50 treatments for completeness in Fig. 6. Take-up rates for the two $10 treatments are quite small—3.6 percent for the reminder card and 5.6 percent for the Visa gift card—and not statistically distinguishable from zero or each other.

Fig. 6 also shows that the $50 treatments do increase take-up relative to the $10 incentives. The $50 gain-framed reminder treatment has a 28 percent take-up rate, and the $50 loss-framed Visa gift card has a 30 percent take-up rate. Regression results including the $10 treatments are presented in Appendix Table 1. Our preferred analyses control for language, enumerator, day-of-week, month-year, and tract fixed effects, as well as demographic characteristics. With these controls, a $50 incentive increases take-up by 21.0 percentage points relative to the $10 incentive. We exclude $10 treatment recipients in the remainder of the paper due to apparent small effects and lack of statistical power, although we note that our results are robust to their inclusion.

After regression adjustment, the loss frame increases the take-up rate by 4.1 percentage points, which is statistically significant at the 5-percent level (see Appendix Table 1). Both $50 treatments are clearly

Table 4
Impact of loss aversion and incentive framing on redemption.

	Redeemed incentive			
	(1)	(2)	(3)	(4)
Loss aversion	0.003	−0.007	0.007	0.001
	[0.010]	[0.015]	[0.015]	[0.013]
Loss frame				0.035
				[0.036]
Loss frame X Loss aversion				0.006
				[0.015]
Observations	1678	843	835	1678
R-squared	0.201	0.228	0.236	0.204
Individual covariates	YES	YES	YES	YES
Enumerator, DOW, MY, and tract FE	YES	YES	YES	YES
Sample	All	Gain frame	Loss frame	All

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. See Table 3 and footnotes for a list of individual covariates. Missing values coded as zero, with missing flags included but not reported. Interaction of loss frame and missing loss aversion flag included but not reported. OLS regression; robust standard errors reported in brackets.

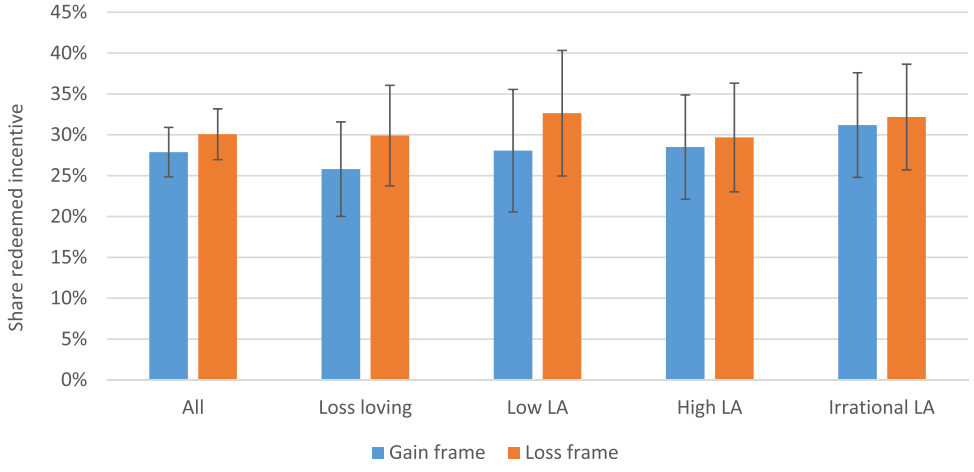

Fig. 7. Relationship between loss aversion and take-up.

Table 5
Impact of trust and incentive framing on redemption.

	Redeemed incentive				
	(1)	(2)	(3)	(4)	(5)
Trust ACCESS	0.059**	0.106***	0.013	0.098***	0.107***
	[0.025]	[0.036]	[0.036]	[0.033]	[0.035]
Loss frame				0.072***	0.093***
				[0.025]	[0.029]
Loss frame X Trust ACCESS				−0.078*	−0.099**
				[0.045]	[0.048]
Don't know if Trust ACCESS					0.031
					[0.043]
Loss frame X Don't know					−0.081
					[0.058]
Observations	1678	843	835	1678	1678
Individual covariates	YES	YES	YES	YES	YES
Enumerator, DOW, MY, and tract FE	YES	YES	YES	YES	YES
Sample	All	Gain frame	Loss frame	All	All

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. See Table 3 and footnotes for a list of individual covariates. Missing values coded as zero, with missing flags included but not reported. Interaction of loss frame and missing trust flag included but not reported. OLS regression; robust standard errors reported in brackets.

distinguishable from the effect of the $10 treatments and zero. In Appendix Table 2, we show additional determinants of take-up. For both $50 treatments, women, Arabic speakers, those with higher cognitive scores, and those with public health insurance are more likely to visit the health clinic.

6.2. Loss aversion

Now we examine the relationship between loss aversion and the decision to visit the health clinic and redeem the incentive. Hypothesis 1a suggests that participants who exhibit higher loss aversion will have higher take-up rates, which we examine while holding constant each treatment arm. Hypothesis 1b predicts that loss-averse individuals will respond more to the loss-framed incentive (Visa gift card) than the gain-framed incentive (reminder card) and that the gap will increase with the degree of loss aversion.

Fig. 7 shows take-up rates by incentive structure, disaggregated by loss-aversion sub-samples. The unadjusted average difference in take-up between loss- and gain-framed incentives, shown in the leftmost two bars, is about 2.2 percentage points. We break participants into four groups according to their estimated loss aversion: gain seeking ($\lambda < 1$); low loss aversion ($1 \leq \lambda < 1.5$); high loss aversion ($1.5 \leq \lambda < 3$); and extremely high loss aversion ($\lambda \geq 3$), which includes those who reject gambles without losses. The take-up gap in redemption rates is 4 to 5 percentage points among more gain-seeking participants, and it is 1 to 2 percentage points among more loss-averse participants. These differences are not statistically significant, and the point estimates present a pattern contrary to what one would expect if the loss framing disproportionately affected the loss averse (Hypothesis 1b). There is no clear pattern linking measured loss aversion to take-up rates nor the gap in take-up rates between loss- and gain-framed incentives.

Table 4 reports regression-adjusted estimates of differential loss-framing effects by loss aversion, using a continuous measure of estimated loss aversion.[9] In column (1), we see no relationship between measured loss aversion and take-up in the full sample. This finding does not support Hypothesis 1a, that those with higher loss aversion would be more likely to take up. In columns (2) and (3), we divide the sample into those who randomly received a gain-framed or loss-framed incentive. Column (2) again suggests no relationship for the gain-framed (reminder card) group, which we expect if the gain-framed incentive (reminder

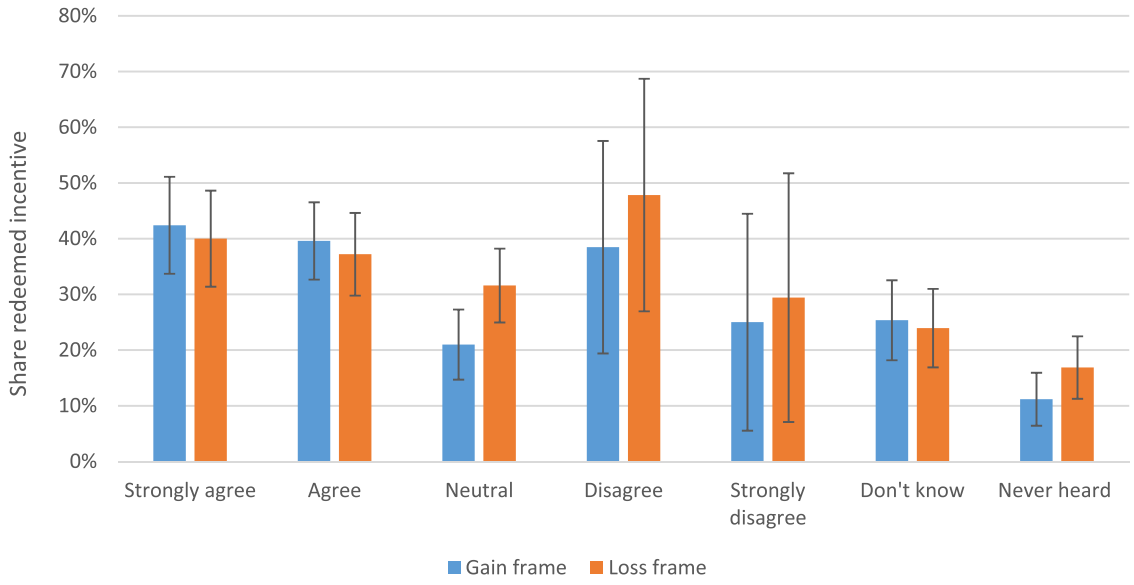

Fig. 8. Relationship between trust and take-up.
Note: The figure shows the fraction redeeming the incentive for those receiving the gain-framed incentive (reminder card) and those receiving the loss-framed incentive (Visa gift card) by baseline responses to questions about whether they have heard of the organization and if so agree that the organization can be trusted. The largest differential response to the two treatments is among those who had not heard of ACCESS or had a neutral feeling about trusting it.

[9] A flag for a loss aversion measure and its interaction with the gift card are included but not reported.

card) did not induce a sense of ownership over the incentive. In column (3), we also see no statistically significant relationship between loss aversion and take-up among those who received the loss-framed incentive (Visa gift card). All three columns are inconsistent with Hypothesis 1a. The results cast doubt on the notion that the loss-framed Visa gift card created a sense of ownership.

In the final column of Table 4, we explore Hypothesis 1b, which suggests that any increase take-up induced by loss-framing will be greater for the more loss averse. However, the interaction term is close to zero and statistically insignificant, providing no support for this conjecture. It does not appear that the more loss averse are more responsive to the loss-framed incentive (Visa gift card) than the less loss averse. In sum, Table 4 suggests that the loss frame did not create a sense of ownership over the incentive among participants, and we do not find evidence to support Hypotheses 1a or 1b.

One concern is that we may lack significant findings in Table 4 because we did not effectively measure loss aversion, either due to the hypothetical nature of the questions or difficulty understanding or interpreting the questions outside of a more controlled lab setting. As noted earlier, the distribution of estimated loss-aversion coefficients is similar regardless of whether measures are incentivized (Brown et al., 2022). Additionally, while some participants refused to answer the questions for religious reasons or answered in a way that predicts extremely high loss-aversion, our estimates are within conventional ranges (Chapman et al., 2018; Brown et al., 2022). Our results are not affected by restricting to non-Muslim respondents, who may be less likely to have religious objections, nor are they affected by restricting to those who were asked or answered the questions in English. We also see no change in results by restricting to respondents in the top 50 or 75th percentile of cognitive ability.[10] Finally, we use alternative ways of coding the reported lottery information, but no reasonable coding method yields a compelling case that loss aversion predicts take-up.

Appendix Table 3 shows that using a categorical measure of loss aversion measure does not change the basic result. We also asked an alternative set of loss aversion questions about whether the individual reports always using coupons or whether they ever forget to use rebates. Using these questions to create an alternative index of loss aversion does not substantively change the null results (not shown). Our interpretation is that the loss frame did not sufficiently induce a sense of ownership in this context such that the loss-averse were more responsive. Overall, our findings suggest loss aversion is not strongly linked to take-up, and we conclude that the Visa gift card does not produce a loss aversion-related effect of loss framing.

6.3. Trust

Next, we turn to the question of trust. Hypothesis 2a is that participants who trust our partner organization at baseline will have higher take-up rates. This is evident in the first column of Table 5 (Panel A). Those who "agree" or "strongly agree" with the notion that people at ACCESS could be trusted were 5.9 percentage points more likely to visit the health clinic to redeem the incentive.[11] Columns (2) and (3) of Table 5 break the sample into those who receive a reminder and those who receive a Visa gift card. The estimated effect of trust is 10.6 percentage points for those who receive the reminder (gain frame) and statistically significant at the 1-percent level. The effect is negligible (1.3 percentage points, with a p-value of 0.72) for those who receive the loss-framed incentive (Visa gift card).

As Hypothesis 2b suggests, we expect that participants who receive the loss-framed incentive (Visa gift card) will have higher take-up rates than those who receive the gain-framed incentive (reminder card), and this gap will be larger among those who do not trust our partner organization at baseline. Columns (4) and (5) of Table 5 investigate this possibility. Participants who do not trust the organization at baseline are much more responsive to the loss-framed treatment (gift card); the impact of the gift card is 7.2 percentage points for this group, as shown in column (4). The statistically significant interaction term in column (4) suggests that there is no comparable effect for those who do trust ACCESS at baseline. In fact, "trusters" are no more responsive to the loss-framed incentive (Visa gift card) than to the gain-framed incentive (reminder card). In column (5), we separate those who responded that they did not know whether they trusted ACCESS, which arguably is different from a neutral stance, making the omitted category those who distrusted, were neutral, or never heard of ACCESS. Although those who reported "don't know" have no statistically significant differential response, the differential response to loss framing between "trusters" and others remains evident in this specification. We surmise that, because non-trusting loss frame subjects have the Visa gift card in hand at the point of decision-making, they have a higher subjective probability that they will receive the incentive payment. For those that already trust the organization, the loss versus gain frame distinction is unimportant.

To demonstrate the robustness of our trust measure, Fig. 8 disaggregates those who disagreed or strongly disagreed separately from those who felt neutral or had not heard of ACCESS. For those with less trust, the point estimate of the loss-framed redemption rate is 5 to 11 points higher than the gain-framed redemption rate. The most pronounced effect of the loss-framed incentive is for those who are not familiar with ACCESS or had a neutral opinion. By contrast, those who trust the organization at baseline do not disproportionately respond to the loss frame. Appendix Table 4 presents regression-adjusted disaggregated results, examining different values of the trust variable, and the conclusions are the same.

6.4. Is it trust or something correlated with trust?

One possible concern is that trust is not randomly assigned and could be correlated with other factors that predict take-up (see Table 3). Although our main models control directly for these factors, they do not permit differential responses to the Visa gift card loss frame treatment. In Appendix Table 5, we test for differential treatment responses across several baseline characteristics, including the statistically significant correlates of trust we identified in Table 3. The apparent effect of trust is not dissipated by allowing the effect of the Loss-framed incentive (Visa gift card) to vary by these observable factors. We cannot rule out the possibility that trust is correlated with an unobserved factor that also affects differential responsiveness to the loss frame compared to the gain frame. However, the most likely explanation is that baseline trust in the organization matters.

We also examine differential responsiveness using measures of trust that are not related to the organization *per se*. We ask respondents whether they trust people in general and whether they trust medical providers. We find that the effect is particular to trust of the organization, as there is no evidence that individuals' general trusting nature drives these results. Respondents who trust people in general or doctors are not differentially responsive to the loss- versus gain-framed incentives (results not shown). This finding suggests that the effect of the loss frame for "non-trusters" is likely driven by the perceived probability that the promised incentive will be delivered by the organization.

7. Conclusions

We conduct a field experiment investigating the use of loss versus

[10] We see only a modest relationship between cognitive ability and the likelihood of non-standard loss-aversion coefficients, with a 1 standard deviation increase in number recall predicting a 2.5 percentage point reduction in the likelihood of a loss-aversion coefficient or 3 or greater (relative to a mean of 24%), and no association with raven's matrix scores

[11] As in Table 3, we compare these "trusters" to those who were neutral, disagreed, strongly disagreed, did not know, or had never heard of ACCESS.

gain frames in promoting preventive health care, and we seek to understand the mechanism underlying the relevance of these frames. Previous literature has emphasized the role of loss aversion in the effectiveness of loss framing, but that does not appear to be the driving factor in this setting. We find no evidence that loss-averse recipients are more responsive to the incentives, nor are they particularly more responsive to the loss-framed treatment, a Visa gift card offered *ex ante*, relative to the gain-framed treatment, a visually similar reminder card. In this setting, it appears that the loss-framed incentive (Visa gift card) did not induce a sufficient sense of ownership among study participants to generate a differential response to loss framing among the loss averse.

We do, however, see a group of participants that *are* particularly responsive to the loss framing: those that do not trust the organization at baseline. For those that already trust our partner organization, there is no difference in responsiveness between the gain-framed and loss-framed treatments. But for those unfamiliar with or less trusting of the organization, the Visa gift card in hand in the loss frame helps participants to feel confident their incentive payment will be given as promised. This finding suggests that, rather than exploiting loss aversion, loss framing instead raises the subjective probability that the incentive will be delivered.

We recognize that loss aversion may be a meaningful driver of behavior in other settings. However, a range of loss frame incentive designs intended to induce a feeling of ownership may simultaneously increase the perceived trustworthiness of the incentive. Study participants may have doubts about future promises in some settings and may respond differently to loss versus gain frames simply because of the trust issue. Thus, researchers should take care in both study design and interpretation to distinguish trust effects from loss aversion-related effects. The framing of an incentive as a loss rather than a gain may be effective even in the absence of behavioral biases because of rational responses to expected payoffs when the participant is unsure about the institution offering the incentive.

The distinction between loss aversion and trust is important from a practical perspective as well. If loss framing is inexpensive, this could be a useful approach for policymakers to maximize the effectiveness of health incentives, regardless of the underlying reason for its effectiveness. However, it may be costly to frame incentives as losses. Hannan et al. (2005) document in a lab setting that "punishment" contracts are perceived as unfair, and the reduced effort associated with unfairness partially offsets the gains that otherwise exist from the loss framing. In some contexts, alternative approaches to raising the perceived trustworthiness of an incentive, either directly or through increasing organizational trust, may be the most cost-effective way to promote desirable health behavior.

Data availability

The data that has been used is confidential.

Appendix

Appendix Fig. 1, Appendix Table 1, Appendix Table 2, Appendix Table 3, Appendix Table 4, Appendix Table 5, Appendix Table 6

Appendix Fig. 1. Reminder card and visa gift card examples.

Appendix Table 1
Impact of treatment on redemption rate.

	Redeemed incentive			
	(1)	(2)	(3)	(4)
$50 Either frame	0.199***	0.212***		
	[0.027]	[0.026]		
$10 Loss frame			0.020	0.016
			[0.023]	[0.026]
$50 Gain frame			0.199***	0.200***
			[0.030]	[0.030]
$50 Loss frame			0.220***	0.241***
			[0.030]	[0.030]
Observations	2004	2004	2004	2004
R-squared	0.065	0.218	0.065	0.219
P-value, $50 coupon = $50 gift card			0.326	0.050**
Individual covariates	NO	YES	NO	YES
Enumerator, DOW, MY, and tract FE	NO	YES	NO	YES

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. See Table 3 and footnotes for a list of individual covariates. Wave fixed effects are included in all specifications. Missing values coded as zero, with missing flags included but not reported. OLS regression; robust standard errors reported in brackets. Controlling for covariates, particularly those on which we are not balanced, affects the estimated effect size and statistical significance of the results between columns 3 and 4.

Appendix Table 2
Determinants of incentive redemption.

	Redeemed incentive		
	(1)	(2)	(3)
Female	0.068**	0.105***	0.086***
	[0.031]	[0.032]	[0.021]
Age	−0.001	0.001	−0.000
	[0.001]	[0.001]	[0.001]
Married	0.032	0.063	0.050*
	[0.036]	[0.039]	[0.026]
Arabic language	0.141***	0.125**	0.131***
	[0.050]	[0.049]	[0.034]
Middle eastern	0.011	0.070	0.045
	[0.057]	[0.056]	[0.038]
Black	0.006	0.129**	0.069
	[0.064]	[0.063]	[0.042]
Hispanic	0.025	0.028	0.016
	[0.097]	[0.072]	[0.055]
Number of children	0.001	−0.015	−0.008
	[0.019]	[0.020]	[0.013]
Household size	0.006	0.008	0.008
	[0.013]	[0.012]	[0.009]
Born in US	−0.056	−0.034	−0.051*
	[0.044]	[0.044]	[0.030]
US citizen	−0.022	0.036	0.012
	[0.058]	[0.058]	[0.040]
High school graduate or less	0.050	0.010	0.035
	[0.046]	[0.049]	[0.032]
Quality of health (1 = excellent, 6 = very poor)	0.018	0.010	0.015
	[0.015]	[0.015]	[0.010]
# Preventive health visits past 12 mo, adults	0.007	0.002	0.005
	[0.009]	[0.007]	[0.005]
# Preventive health visits past 12 mo, children	0.012	0.007	0.009
	[0.010]	[0.007]	[0.006]
Know about ACCESS	0.019	0.007	0.000
	[0.046]	[0.049]	[0.033]
Ever used ACCESS	0.069	−0.032	0.022
	[0.044]	[0.044]	[0.030]
Trust ACCESS	0.066	0.023	0.047*
	[0.042]	[0.042]	[0.029]
Loss aversion (Kőszegi-Rabin)	−0.005	0.005	0.004
	[0.015]	[0.015]	[0.010]
Raven's index score, normalized	0.009	0.015	0.014
	[0.017]	[0.018]	[0.012]
Number recall score, normalized	0.043**	0.005	0.026**
	[0.018]	[0.018]	[0.012]
Insured, employer/spouse	−0.011	−0.076	−0.041
	[0.045]	[0.047]	[0.032]
Insured, public	0.089**	0.103**	0.087***
	[0.045]	[0.049]	[0.032]
Observations	843	835	1678
R-squared	0.242	0.237	0.205
Sample	Gain frame	Loss frame	All

* $p < 0.10$, ** $p< 0.05$, *** $p<0.01$. Missing values coded as zero, with missing flags included but not reported. Wave fixed effects included in all specifications. Controls for any other insurance, self-purchased insurance, per-capita emergency health visits (adults and children), per-capita non-emergency health visits (adults and children), and order of loss-aversion questions included but not reported. Middle Eastern ethnicity question asked only in 2014 and 2015, and education asked only in 2015. Sample includes recipients of $50 cards. OLS regression; robust standard errors reported in brackets.

Appendix Table 3
Impact of loss aversion and incentive framing on redemption, disaggregated.

	Redeemed incentive			
	(1)	(2)	(3)	(4)
Low loss aversion	−0.018	−0.012	−0.043	0.006
	[0.035]	[0.048]	[0.056]	[0.046]
High loss aversion	−0.003	−0.007	0.003	0.001
	[0.037]	[0.052]	[0.058]	[0.047]
Extremely high loss aversion	0.016	−0.018	0.024	0.010
	[0.038]	[0.056]	[0.056]	[0.049]
Loss frame				0.053
				[0.043]
Loss frame X Low LA				−0.049
				[0.068]
Loss frame X High LA				−0.006
				[0.062]
Loss frame X Extremely high LA				0.014
				[0.060]
Observations	1678	843	835	1678
R-squared	0.202	0.228	0.237	0.204
P-value, loss aversion = 0	0.830	0.987	0.706	0.996
P-value, Loss frame X LA = 0				0.823
Sample	All	Gain frame	Loss frame	All

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. See Table 3 and footnotes for list of individual covariates. Missing values coded as zero, with missing flags included but not reported. Interaction of loss frame and missing loss aversion flag included but not reported. OLS regression; robust standard errors reported in brackets.

Appendix Table 4
Impact of trust and incentive type on redemption, disaggregated.

	Redeemed incentive			
	(1)	(2)	(3)	(4)
Trust ACCESS: Strongly agree	0.050	0.139**	−0.028	0.107*
	[0.043]	[0.063]	[0.063]	[0.056]
Trust ACCESS: Agree	0.074**	0.138***	0.040	0.124***
	[0.037]	[0.051]	[0.058]	[0.046]
Trust ACCESS: Neutral	0.007	0.007	0.026	0.006
	[0.037]	[0.051]	[0.057]	[0.045]
Trust ACCESS: Disagree	0.103	0.146	0.090	0.126
	[0.075]	[0.110]	[0.108]	[0.107]
Trust ACCESS: Strongly disagree	−0.052	0.004	−0.069	−0.026
	[0.082]	[0.114]	[0.129]	[0.102]
Trust ACCESS: Don't know	−0.006	0.067	−0.051	0.039
	[0.038]	[0.054]	[0.056]	[0.049]
Loss frame X Strongly agree				−0.012
				[0.059]
Loss frame X Agree				0.000
				[0.050]
Loss frame X Neutral				0.096**
				[0.045]
Loss frame X Disagree				0.059
				[0.137]
Loss frame X Strongly disagree				0.054
				[0.158]
Loss frame X Don't know				0.012
				[0.050]
Loss frame X Never heard of ACCESS				0.101**
				[0.039]
Observations	1678	843	835	1678
R-squared	0.206	0.242	0.238	0.211
Sample	All	Gain frame	Loss frame	All

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. See Table 3 and footnotes for list of individual covariates. Never heard of ACCESS is omitted trust category. Missing values coded as zero, with missing flags included but not reported. Interaction of loss frame and missing trust flag included but not reported. OLS regression; robust standard errors reported in brackets.

Appendix Table 5
Impact of incentive type and trust on redemption, checking for alternative mechanisms.

	Interacted covariate								
	Female	Age	Married	Born in US	Arabic speaker	Insured	Self-purchased insurance	Very good health	High aptitude
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trust ACCESS	0.108***	0.107***	0.108***	0.106***	0.105***	0.107***	0.106***	0.107***	0.107***
	[0.035]	[0.035]	[0.035]	[0.036]	[0.036]	[0.035]	[0.035]	[0.035]	[0.035]
Loss frame	0.078**	0.090**	0.088**	0.092**	0.095***	0.098*	0.091***	0.079**	0.100***
	[0.037]	[0.036]	[0.035]	[0.041]	[0.030]	[0.053]	[0.030]	[0.034]	[0.038]
Loss frame X trust ACCESS	−0.101**	−0.099**	−0.102**	−0.098**	−0.096**	−0.098**	−0.098**	−0.097**	−0.100**
	[0.048]	[0.048]	[0.049]	[0.049]	[0.049]	[0.048]	[0.048]	[0.048]	[0.048]
Covariate	0.072**	−0.061	0.044	−0.055	0.141***	−0.288	−0.050	0.023	0.008
	[0.029]	[0.047]	[0.033]	[0.037]	[0.042]	[0.190]	[0.068]	[0.044]	[0.042]
Loss frame X covariate	0.027	0.006	0.011	0.002	−0.010	−0.005	0.035	0.033	−0.011
	[0.042]	[0.042]	[0.042]	[0.043]	[0.051]	[0.053]	[0.084]	[0.042]	[0.043]
Observations	1678	1678	1678	1678	1678	1678	1678	1678	1678
R-squared	0.209	0.210	0.209	0.209	0.209	0.210	0.209	0.210	0.209

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. See Table 3 and footnotes for list of individual covariates. Interacted covariates in columns 1 and 3–7 defined as binary variables equal to 1 for respondents with that characteristic. Age equals 1 if the respondent is older than the sample median age of 35. Very good health equals 1 if the respondent reports having "excellent" or "very good" health in the past month, and high aptitude equals one if the respondent's averaged raven's test and digit span results are in the top half of the distribution. Missing values coded as zero, with missing flags included but not reported. Interactions of loss frame and missing trust flag, don't know whether trust flag, and missing covariate flags included but not reported. OLS regression; robust standard errors reported in brackets.

Appendix Table 6
Impact of loss aversion and incentive type on redemption, loss aversion based on Tversky and Kahneman (1992).

	Redeemed incentive			
	(1)	(2)	(3)	(4)
Loss aversion	−0.005	−0.013	0.006	−0.011
	[0.008]	[0.011]	[0.012]	[0.010]
Loss frame				0.013
				[0.037]
Loss frame X Loss aversion				0.013
				[0.014]
Observations	1678	843	835	1678
R-squared	0.201	0.228	0.236	0.204
Individual covariates	YES	YES	YES	YES
Enumerator, DOW, MY, and tract FE	YES	YES	YES	YES
Sample	All	Gain frame	Loss frame	All

*** $p<0.01$, ** $p<0.05$, * $p<0.1$. See Table 3 and footnotes for list of individual covariates. Missing values coded as zero, with missing flags included but not reported. Interaction of gift card and missing loss aversion flag included but not reported. Robust standard errors reported in brackets. Loss aversion coefficient from 0 to 5 by assigning the minimum lambda following respondent preferences, assuming a risk aversion parameter of 1. A binary indicator for rejecting a 10/0 or 10/2 offer, and its interaction with the gift card, is included but not reported.

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