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NEW VOICES

Take up

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Abstract
Why are take up rates incomplete or low when the relevant opportunities are unambiguously advantageous to people who are eligible for them? How can public officials promote higher take up of opportunities? All over the world, these are challenges of the first order. There are three primary barriers to take up: learning costs, compliance costs, and psychological costs. These costs lower the net expected benefit of opportunities, and reduce participation in otherwise advantageous programs. Fully rational agents would consider these costs in their take up decisions, and in light of behavioral biases, such costs loom especially large and may seem prohibitive. Experimental and other evidence suggest methods for reducing the barriers to take up and the effects of behavioral biases. Use of such methods has the potential to significantly increase access to a wide range of opportunities that would increase individual well-being and social welfare.

Keywords: Take up; microeconomics; consumer theory; behavioral economics; behavioral science

Introduction

Why are take up rates incomplete or low when opportunities are unambiguously advantageous to people who are eligible for them? How can leaders encourage higher take up of opportunity? All over the world, these are challenges of the first order.

Take up is defined as receiving a benefit for which an individual is eligible. The take up rate is the fraction of those eligible for a benefit who participate and receive the benefit. Take up rates vary dramatically across programs and countries. Nearly one-quarter of high-income countries have take up rates of social benefits of 40% or less (Ko and Moffitt, 2022). Incomplete take up rates of benefits, defined as take up less than 100%, pose a potential puzzle to economists who typically assume that 'more is better'. Of course, it is true that the costs of take up might exceed the benefits, but in many cases, it is extremely difficult to show that incomplete take

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up rates can be adequately justified on that ground. In any event, it is important to understand the diverse costs of take up to understand why take up rates are often low.

This article proceeds as follows. The first section, 'What we know', reviews what we now know about the determinants of benefit take up from both the traditional economic theory and behavioral science perspective. We focus on welfare programs because they are well-researched and instructive about why individuals may not participate in opportunities that are likely to provide significant benefits for people. We also extend lessons learned to take up of opportunity broadly. The second section, 'Approaches to increase take up', reviews frontier research on policy changes that affect benefit take up, and recent experimental evidence of the effects of such changes. The final section, 'Conclusion', briefly concludes.

What we know

The economics of take up decisions

The notion that 'more is better' is a core property of the economic theory of consumer demand. This property, termed *nonsatiation* by economists, is the idea that for any bundle of goods, there is often another bundle of goods nearby, or near enough, that provides higher utility (Mas-Colell, 1995). An economic good is defined as an item that is desired and provides utility to the consumer, whereas a 'bad' provides negative value to the consumer (Varian, 2006). Our focus here is on economic goods. Economists have generally assumed that nonsatiation holds because it has been observed in practice. For example, recent research has shown that people are happier with more money compared to less, regardless of their income level (Killingsworth, 2021).[1] Additionally, in a market in which consumers can freely dispose of excess goods, consumers are not made worse off by having more of a good. By this reasoning, consumer theory predicts that a consumer will always choose more of a good when given the choice between more or less because it results in higher utility.

On plausible assumptions, economists who accept traditional consumer theory would expect that so long as the costs of participation are low, there would be near complete levels of participation in programs that are designed to increase individual or household well-being through the provision of 'free' or highly subsidized goods. Consider the take up of welfare programs as an illustrative example. For eligible individuals, welfare programs offer more of an economic good (e.g., money, food, health care, etc.) to individuals or households. Accordingly, take up rates should be near complete if consumers are utility-maximizing. However, incomplete take up rates of welfare programs are well-documented across program types and countries (Ko and Moffitt, 2022), violating the key tenant of nonsatiation.

An influential article explained this apparent violation of consumer theory, suggesting for the first time that non-participation in welfare programs by eligible individuals could be explained by stigma (Moffitt, 1983). Stigma is explained as a form of disutility that results from the decision to participate in a program and the benefit accrued from participation in the program (Moffitt, 1983; Hernanz *et al.*, 2004).

[1]These findings are in contrast to other research, which has shown that experienced well-being plateaus above incomes of $75,000 per year (Kahneman and Deaton, 2010).

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Stigma can be personal (e.g., negative self-characterizations) or social (e.g., negative characterizations by others) because of participation in welfare – a phenomenon that had been documented by sociologists at the time but largely ignored by economists (Horan and Austin, 1973).

Moffitt (1983) developed a simple utility function that contains both disposable income and participation in welfare. Agents choose their optimal labor supply and whether to apply for welfare, which is associated with a 'cost' of participation – stigma. He models two types of stigmas: (a) a fixed cost, whereby individual utility is decreased if agents receive welfare; (b) a variable cost, whereby individual utility decreases as the size of the benefit increases. In the model, utility is accrued by:

$$U = U(Y + \gamma PB) - \phi P$$

where Y is the income in the absence of the program, B is the benefit derived from the program, P is an indicator for program participation, γ is the variable cost of participation and ϕ is the fixed cost of participation. Using data from the 1976 wave of the Michigan Panel Study of Income Dynamics, Moffitt empirically tests the presence of both types of stigmas for single female-headed households that are eligible for Aid to Families with Dependent Children and estimates a take up rate of approximately 45%. He finds that only the fixed cost of stigma (ϕ) is statistically significant, which implies that stigma affects the decision to participate in welfare, but once on welfare, the size of the benefit has no additional stigmatizing effect. Additional empirical research has found stigma to be an important reason for non-participation in other benefits, such as Temporary Assistance for Needy Families (TANF) and Medicaid (Stuber and Kronebusch, 2004; Stuber and Schlesinger, 2006). Contrary to the economic assumption that 'income is income', and so more is always better, this model illustrates that the source of income matters for utility. Stigma increases the cost of participating in the program, so non-participation in welfare programs can be a utility-maximizing decision for some agents or households that would participate in the absence of stigma.

In the economics literature, learning and transaction costs are viewed as equally or more important barriers to participation in social programs (Currie, 2004). First, learning costs refer to the time and effort required to learn about a program or service (Herd, 2018). Eligible people may choose non-participation because of a lack of information concerning eligibility, the level of benefits or the logistics of the application process.[2] In this case, individuals choose non-participation due to learning costs that result in a lack of information – not because the costs of participation are higher than the benefits. This is problematic because it raises the possibility that people are not making optimal decisions about their use of programs. Rather, a lack of information, which may or may not be costly to obtain, is preventing access to and benefit

[2]In contrast, consider another possible scenario where lack of information is not problematic. In this case, eligible individuals make optimal decisions about their use of programs. If they choose non-participation, it is because the costs of participating are greater than the benefits. Lack of information would play a minor role, as individuals would learn about programs so long as the anticipated benefits of doing so seemed large enough. As a result, the individuals with the highest expected benefit from the program would participate, and non-participation would not be a concern.

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from programs that are available. Consistent with this view, in a survey of people eligible for the French minimum income benefit, 68% cited lack of information as a reason for non-participation (Dubois *et al.*, 2015).

Second, compliance costs[3] refer to the costs associated with applying for a program, including the time and effort incurred trying to abide by program rules and meet eligibility criteria. These types of costs may arise from detailed eligibility criteria, complicated documentation requirements, difficult and time-consuming forms, waiting time and trips to program offices to be interviewed and tested. While these measures are introduced to enable program administrators to accurately determine eligibility and ensure program integrity, they also introduce hassle and cognitive costs (to be discussed in the next subsection) into the application process, which lowers take up. Several empirical studies have documented the negative effect of compliance costs – notably, complexity and administrative hassle – on program take up (Currie and Grogger, 2001; Bitler *et al.*, 2003; Aizer, 2007; Kleven and Kopczuk, 2011).

Traditional economic theory assumes that people are rational, hold coherent, well-informed and justified beliefs and pursue their goals efficiently based on cost–benefit analysis (CBA) (Bertrand *et al.*, 2006). This view holds that individuals account for costs – including those associated with stigma, learning and compliance – and optimally choose participation or non-participation in a program based on the net benefit that they would receive. Table 1 summarizes the three primary costs that may deter program take up. In the next subsection, we discuss a broader set of behavioral biases that are associated with take up of opportunity.

Behavioral science and take up

While the CBA framework has remained central to studies on take up, behavioral science has introduced important additions to the classical model of consumer theory. In particular, individuals make suboptimal decisions when experiencing psychological costs, which can include the stigma associated with the program, stress or frustration in meeting requirements, or loss of autonomy because of supervision (Herd and Moynihan, 2018). To be sure, rational agents would consider these costs. The problem is that psychological and attitudinal shortcomings can result in judgments and decisions that are misguided and fallible choices (Bertrand *et al.*, 2006). This subsection explores behavioral and psychological costs – including cognitive, motivational and emotional limits to decision-making – that can affect the take up of welfare programs, and that extend to the take up of opportunity broadly.

Scarcity and complexity

Cognitive biases can affect optimal decision-making in several ways that are relevant to take up decisions. An important prerequisite for take up of any program is that eligible populations know about it and understand it. Scarcity, defined as broadly as 'having less than you feel you need', can affect the cognitive capacity or 'bandwidth' of relevant populations, the psychological mechanisms that underlie people's

[3]In the literature, compliance costs and transaction costs appear to be used interchangeably. In this paper, we will use compliance costs for consistency.

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Table 1. Three costs associated with take up based on Herd and Moynihan (2018)

Learning costs	The time and effort associated with learning about the opportunity, eligibility requirements and status, the benefits available and processes to gain permission to participate
Compliance costs	The time and effort associated with collecting and submitting proof of eligibility for the opportunity, and responding to additional administrative verifications and requirements during and after participation
Psychological costs	The stigma associated with applying for and participating in the opportunity, loss of autonomy as a result of paternalistic guidance, frustration related to learning and compliance costs, and other stressors related to participation

ability to solve problems, retain and process information and engage in logical reasoning to make optimal decisions (Mullainathan and Shafir, 2013).[4] It is rational to take account of limited bandwidth in deciding what to do. But when individuals are operating in circumstances of cognitive scarcity, people might 'tunnel', directing disproportionate attention to immediate problems and costs, while neglecting or overlooking opportunities that may have moderate-term or long-term benefits. Indeed, research on 'unbanked' American households (the majority of whom live in poverty) has shown that being in situations that are unfamiliar, threatening or stigmatizing (e.g., completing paperwork in a bank) can consume cognitive resources, leaving fewer available to process information about participation in the financial mainstream (Bertrand *et al.*, 2006). In terms of take up of opportunity broadly, for individuals experiencing high levels of cognitive scarcity, immediate learning and compliance costs could be exaggerated relative to seemingly distant benefits, and information relevant to decision-making may become more difficult to interpret, resulting in lower-than-optimal participation.

Even in the absence of scarcity, several studies have shown that people may well misunderstand information when it is complex. For example, in the case of pricing (Liebman and Zeckhauser, 2004) and taxes (Chetty *et al.*, 2009), people have been shown to misunderstand costs and benefits when the information is presented in a complex way, resulting in inaccurate assessments of risk. Complexity can contribute to choice overload, which occurs when the number of choices increase such that people feel overwhelmed and choose non-participation (Iyengar and Lepper, 2000). For example, Baicker *et al.* (2012) explore choice overload in the context of health insurance take up, and present evidence that people prefer fewer choices in plans and, in some cases, avoid choosing altogether when there are many options. As a consequence, complexity and choice overload may lower the take up of opportunities broadly.

[4]It is important to note the distinction between scarcity and stress (Mullainathan and Shafir, 2013). Stress is a physiological and psychological response to internal or external pressures in the environment (APA Dictionary of Psychology, n.d.). Stress activates hormones such as cortisol or adrenaline to active a 'fight or flight' response. Scarcity, on the other hand, refers to a 'bandwidth' tax that lowers cognitive resources, making it more difficult to process information and make optimal decisions. While stress can result in cognitive overload and contribute to cognitive scarcity, or cognitive scarcity can result in stress, the two are distinct with different underlying mechanisms.

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Hassel and sludge

Take up is also affected by small 'hassle' factors, or 'sludge', that discourage participation by imposing additional (and often unnecessary) administrative burdens onto individuals. A rational agent will consider sludge because it imposes costs. But the costs might loom excessively large when they amplify behavioral biases, such as inertia and procrastination (Sunstein, 2021, 2022).

The relevant costs are associated with the application or approval process, and include the amount of paperwork, documentation, travel and meeting time and other practical considerations involved in participation. While certain hassle costs may be necessary in order to verify that programs are reaching the intended population, these costs can escalate to unacceptable levels of sludge when they result in excessive frictions, including frictions that exploit behavioral biases (Akerlof and Shiller, 2015; Sunstein, 2021, 2022). For example, sludge exacerbates behavioral biases such as inertia (Madrian and Shea, 2001) and procrastination (Akerlof, 1991). Although hassle costs might appear minor relative to other costs, they represent a real barrier to program take up (Bertrand *et al.*, 2006; Sunstein, 2021), especially when understood in terms of their compounding effects on other behavioral biases. Individuals may be inclined to put off tasks necessary for take up if they involve hassle or sludge to the point that they never perform them.

Present bias and misperception of risks

Many of the costs associated with take up are borne before the benefits are realized. For example, learning and compliance costs, as well as hassle costs, are often upfront costs that affect CBA about whether to participate in a program. Traditional economic models assume *exponential discounting*, which is the idea that rational, well-informed agents account for the present costs in comparison to future unrealized benefits accurately, and make optimal decisions according to the CBA. As a result, an individual's relative preference for a program in the present versus in the future should be identical. However, research has shown that individual preference for well-being changes temporally and that people are *present-biased*, meaning that they put more weight on the present than on the future in decision-making (O'Donoghue and Rabin, 1999a, 1999b). Relatedly, individuals may be inclined to procrastinate as present costs are more salient than future costs (Akerlof, 1991). If the costs of take up are concentrated on the front-end and people are present-biased with a tendency for procrastination, the result may be that individuals fail to take up opportunities even if doing so will reduce their well-being in the long run.

Present-biased decision-making is one mechanism through which an individual ability to accurately assess risk is eroded (Thaler and Sunstein, 2008). For example, people delay signing up for 401(k) plans because they do not accurately experience their need for the plan in the present (Madrian and Shea, 2001). Additionally, Kahneman and Tversky (1979) show that misperceptions about risk can result from overestimating events that will occur with low probability and underestimating events that will occur with high probability. Misperceptions about risk affect decisions to take up programs if people underestimate the probability that they will need the program or overestimate the probability that they will not need the program.

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Psychological responses – such as feelings of anger, frustration and humiliation – associated with low program awareness, confusion, scarcity and complexity, avoidance of hassle or sludge and inclination toward present bias and misperception of risk discourage program take up. It follows that reducing these barriers would encourage the take up of programs that are highly beneficial to individuals. A number of experiments have been run to understand how to address the economic costs and behavioral biases that lower take up, and these studies and their implications for encouraging take up of opportunity broadly are the focus of the next section.

Approaches to increase take up

Barriers to take up of opportunity can be pooled into three broad categories: learning costs, compliance costs and psychological costs (including stigma), although there are intersections between them. Each of these categories is nuanced and composed of diverse challenges with distinctive implications for responses to increase take up. Table 2 summarizes approaches to increase take up based on each cost and cites related experiments.

First: Learning costs can be reduced by making information readily available. In collaboration with the IRS, Bhargava and Manoli (2015) performed a large field experiment to examine the causes of low EITC take up, and find that the way in which information is delivered affects take up. They targeted California residents who were eligible for the EITC but did not claim the credit in the prior year (2009). All of the interventions were letters sent out in an envelope indicating a prominent message of 'Important – Good News for You'. They designed four interventions:

1. *Simplicity intervention (control):* for the control group, they sent out a simplified notice of an initial document about the EITC that had been sent out months earlier.
2. *Complexity interventions:* this intervention sent out the same information as the initial EITC notice
    a. With standardized text.
    b. Adds eligibility requirements to the notice to test the effect of complexity.
3. *Information interventions:* this intervention sent a notice about the EITC that
    a. Presents an upper bound of the potential benefit (e.g., 'you may be eligible for up to $457').
    b. Presents the amount of time it could take to complete and return the eligibility worksheet to test transaction costs.
    c. Presents that reporting incorrect information will not result in a penalty to test the importance of perceived penalty costs.
    d. Includes an information flier with benefit information.
4. *Stigma intervention:* this intervention tests for
5. Social stigma by using a stigma-reducing headline (e.g., 'usually, four out of five people claim their refund').
6. Personal stigma by emphasizing that the credit was an earned consequence of hard work not a welfare transfer.

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Table 2. Approaches to increase take up

Cost	Cost-minimizing response and relevant experiments
Learning	• Make information easily accessible through advertising campaigns (Daponte *et al*., 1999; Bertrand *et al.*, 2005, 2010) • Simplify information about program, eligibility requirements, nature of benefits, conditions that must be satisfied (Bertrand *et al*., 2006) • Send repeated reminders with accessible information on the program and clear steps regarding what needs to be done (Bhargava and Manoli, 2015; Karlan *et al*., 2016)
Compliance	• Reserve a spot for individuals (Milkman *et al.*, 2011; Patel *et al*., 2022) • Provide information frequently and repeatedly (Hassan and Barber, 2021; Patel *et al*., 2022) • Optimize screening intensity (Kleven and Kopczuk, 2011) • Burden and hassle reduction (Bertrand *et al*., 2006; Milkman *et al.*, 2011) • Reduce recertification requirements (Currie and Grogger, 2001) • Sludge audit application process to minimize excessive frictions that may deter individuals from applying (Sunstein, 2022)
Psychological	• Design program benefits to reduce personal and social stigma (Ratcliffe *et al.*, 2008) • Offer fewer options (Iyengar and Lepper, 2000; Beshears *et al.*, 2013) • Frame messages that emphasize the cost/benefit of not taking/taking action, stronger evidence for loss framing being effective (Banks *et al.*, 1995; Hossain and List, 2012) • Use commitment devices (Rogers *et al.*, 2014) • Intertemporal incentives such as 'fresh starts' (Dai *et al.*, 2014) • Showcase social network participation, including trusted community members (Bertrand *et al.*, 2000; Duflo and Saez, 2003; Gerber and Rogers, 2009) • Choice architecture to encourage certain decisions (Thaler and Sunstein, 2008) • Nudge 'default' or automatic enrollment options to counter present bias and procrastination (Madrian and Shea, 2001; Bergman *et al.*, 2020; Shepard and Wagner, 2022) • Paternalistic guidance when judgment leads to fallible choices (Conly, 2012)

Overall, Bhargava and Manoli (2015) found that simply having a second opportunity to make a claim, months after the initial notice, led 0.22 of the sample to take up. Across the sample, simplification – either through making the notice more visually appealing or shorter – increased take up from 0.14 (control) to 0.23. Including the possible benefit amount further improved take up from 0.23 to 0.31. Finally, attempts to lower social and personal stigma did not have a significant effect on take up. The results show that the frequency, salience and simplicity of information lead to a significant uptake in EITC claimants.

These results suggest that if the goal is to increase take up, it is not only important to provide information but also to be thoughtful about *how the information is presented*. Consistent with this view, Daponte *et al.* (1999) conduct a randomized experiment on Food Stamps Program participation and find that well-designed efforts

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to provide information to households that are eligible for food stamps causes a significant increase in participation. Dechausay *et al.* (2015) find that behavioral messaging – such as posts cards and text messages that had implementation prompts, loss aversion themes and prominent deadlines – increased meeting attendance among New Yorkers eligible for an add-on credit to the EITC compared to standard messaging. Saez (2009) conducted a large field experiment in collaboration with H&R Block during the 2006 tax season and finds that both presentation of information and incentives matter for retirement saving contributions. In an experiment based in a Chinese manufacturing firm, Wanlida Group Company, Hossain and List (2012) show that framing information about incentives in terms of 'losses' has a larger effect on individual and team productivity than framing information as 'gains', but both are impactful compared to standard messaging. Consistent with this, Bertrand *et al.* (2006) find that loss-based framing can be more effective than gain-based framing in motivating unbanked individuals to open bank accounts.

Bhargava and Manoli (2015) build upon other experiments that show how information (Chetty and Saez, 2013; Karlan *et al.*, 2016), salience (Chetty *et al.*, 2009; Finkelstein, 2009) and complexity affect decisions (Bhargava *et al.*, 2015). Their paper is one of the few that attempts to parse out the effects of traditional economic costs and psychological costs on take up. The findings are consistent with the view that learning costs and informational complexity are a greater barrier to participation than psychological costs (such as stigma).

Second: Simplifying access to participation cuts compliance costs and increases take up. Two large-scale experiments with the goal of increasing influenza vaccination rates provide insight on this. Milkman *et al.* (2011) study the effects of variations in implementation prompts on influenza vaccine compliance among nearly 4,000 employees at a large Midwestern utility firm. The employees were randomly assigned to receive one of three letters about the company's on-site influenza clinic. The first letter (the control) simply informed the employee that the firm was holding free influenza shot clinic and specified the dates and times. The second letter had the same information as the control but also prompted the employee to make a plan for which day they would get vaccinated. The third letter added to the second by also asking for the time that the employee planned to get vaccinated. The results show that vaccination rates increased among employees as the specificity of the prompt increased. The control group had a vaccination rate of 33%, which increased by 1.5 percentage points for treatment two (not a statistically significant difference) and by 4.2 percentage points for treatment three (statistically significant and meaningful magnitude). This shows that encouraging people to make a plan to accomplish a desired outcome can increase the likelihood of success.

Relatedly, in a recent large-scale experiment that was also aimed at increasing influenza vaccination rates, Patel *et al.* (2022) sent out text reminders to promote vaccination appointments 3 days before a visit with patients' primary care clinician. Nineteen different text messages (interventions) were developed, which were randomized to nearly 75,000 patients across two health systems in the Northeastern U.S. On average, they found that the text messages increased vaccination rates by 1.8 percentage points relative to the control group, which did not receive any text messages. In particular, text messages that communicated that a vaccine was 'reserved for you'

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and resembled the type of message that patients expected to receive from their health provider performed best at increasing vaccination rates. Three out of five of the best-performing messages used the phrase 'reserved for you'. An explanation for the success of this communication strategy is that it provided patients with a sense of ownership of their vaccine dose. This is consistent with research on the endowment effect, which shows that people take action to avoid losing something that they feel ownership of (Kahneman *et al.*, 1991).

Third and most broadly: Choice architecture, including but not limited to the provision of information and simplification, can alter or reduce the effects of psychological biases and result in increased take up (Thaler and Sunstein, 2008). Automatic enrollment may well be the most effective form of choice architecture. As discussed, people sometimes demonstrate time inconsistency in choices, and tend to overestimate the present compared to the future in their decision-making. Nudges, designed to encourage decisions that benefit individuals in the future but not (or less so) in the present, can both preserve autonomy and point people in a utility-maximizing direction. This issue is particularly salient in making optimal retirement saving decisions, whereby people have to make choices to invest in their future in the present. Madrian and Shea (2001) present the most well-known evidence that choice architecture in the form of a shift from "opt in" to "opt out" can effectively increase participation rates. They examine the effects of a 1998 switch to automatic enrollment on 401(k) saving decisions among employees at a fortune 500 U.S. healthcare and insurance company. After 1998, employees who did not 'opt-out' of the 401(k) were automatically enrolled with a 3% contribution rate. The analysis takes place in 1999, 15 months after the switch to automatic enrollment.

The authors find that 401(k) participation is significantly higher after the company switched to automatic enrollment. Interestingly, the default contribution rate and investment allocation that the company chose for the default plan had a significant influence on the saving behavior of all 401(k) participants. The authors argue that their findings illustrate the 'power of suggestions' from a source of authority to motivate decisions that are affected by behavioral biases such as time inconsistency, procrastination and inertia in decision-making. Consistent with this finding, Chetty *et al.* (2014) and Beshears *et al.* (2009) find that structuring participation in saving plans as a 'passive' rather than 'active' choice through automatic enrollment increases take up substantially in Denmark and in a U.S. chemical company, respectively.

The impact of automatic enrollment has been well-documented in several other important settings. Shepard and Wagner (2022) find that when an automatic enrollment policy for subsidized health insurance for low-income adults in Massachusetts was suspended in 2010, enrollment among qualified adults fell by 33%, suggesting that small hassles can have a major impact on health insurance take up. Another paper shows that automatic enrollment of parents in Washington D.C. in an education technology platform that alerts them about their child's academic performance massively increases parental adoption of the platform; automatic enrollment also improves student academic achievement as measured by Grade Point Average and course passing (Bergman *et al.*, 2020). Welfare take up increases with automatic enrollment, although targeting may decline as a consequence (Alatas et al., 2016). Studies on organ donation programs have found that policies such as

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presumed consent legislation may increase donation rates (Johnson and Goldstein, 2003; Abadie and Gay, 2006), though it is important to be cautious with these findings (Thaler & Sunstein, 2021).

Fourth: Social networks can play a role in reducing the costs of participation and thereby increasing the take up of opportunities (Currie, 2004). Social networks can affect individual decision-making through norms and information. Three instructive papers examine the effects of social networks on take up via these two channels. Gerber and Rogers (2009) conducted two randomized field experiments on the effect of descriptive social norms on voter turnout. The authors designed two get-out-the-vote scripts, which were delivered to voters via phone calls in the days prior to the November 2005 general election in New Jersey and the June 2006 primary election in California.

The first script was a 'high-turnout' script, which was intended to influence participants' perception of voter turnover as being high. The high-turnout script used statements such as 'highest election turnout ever' and 'we encourage you to join your fellow citizens'. The second script was a 'low-turnout' script, which was intended to influence participants' perception of voter turnover as being low. The low-turnout script used statements such as 'millions of citizens have failed to vote in past elections' and 'we encourage you to buck this trend among your fellow citizens'. In both New Jersey and California, the high-turnout script increased the share of turnout intention relative to the low-turnout script. Specifically, the high-turnout script was over 7 percentage points more likely to lead to a response of 100% likely to vote in the upcoming election. Not surprisingly, there was heterogeneity in the effect based on the subgroup of the population. For instance, citizens who were infrequent voters were affected by the high-turnout script relative to the low-turnover script, while citizens who were frequent voters were unaffected. This research suggests that individuals' actions (or rather, intentions in the case of this paper) are directly affected by their perception of what their social network is doing.

Relatedly, Bertrand *et al.* (2000) examine how social networks affect welfare take up via information sharing. They explore whether being surrounded by people who speak the same language (i.e., their social network) increases welfare utilization more for individuals from language groups that have higher welfare utilization (relative to individuals from language groups that have low welfare utilization). Specifically, the authors use the 5% 1990 Census Public Use Micro Sample to measure the size of social networks by 'contact availability'. Contact availability is defined as the proportion of people in one area that belong to the same language group divided by the proportion of people in the US that belong to that language group. The intuition is that as the share of people who speak one's language increases, so does the ability to gain access to information about welfare programs in one's native language from one's immediate community. They regress an indicator for welfare use – which equals one if the individual received any form of public assistance other than social security – on contact availability. The results confirm the importance of networks in welfare participation: they find highly significant and positive coefficients in the interaction between contact availability and mean welfare participation of a language group.

Finally, Duflo and Saez (2003) examine the role of information and social interactions within a network on employee decisions to enroll in a retirement plan within a

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large university. In their experiment, they introduce small incentives of $20 to a randomized subset of nonfaculty employees to attend a benefits fair where they learn about the retirement plan. They find that individuals who are directly offered the incentive are more likely to enroll in the retirement plan after attending the fair. Perhaps more interesting, the authors find that employees who are not directly offered the incentive but are within the working group of the employee who was offered the incentive are just as likely to subsequently enroll in the retirement plan. This suggests that providing information to one person within a group can generate spillover effects and affect the behavior of other members of the group.

Improving decision-making broadly using System 1 and System 2

To summarize the discussion thus far: We have shown how learning costs, compliance costs and psychological costs can discourage the take up of opportunity. Using evidence from field experiments aiming to increase take up of a diverse array of opportunities, we have explored several approaches to increase take up of opportunities among eligible populations, including (1) simple presentation of information, (2) minimizing unnecessary hassle and reducing sludge in the application process, (3) use of choice architecture in general, including automatic enrollment, and (4) enlisting norms and information sharing through social networks. From the relevant evidence, it is clear that small changes in the choice architecture of programs can have a large effect on the take up of opportunity.

Most of the discussion up to this point has focused on what choice architects can do to encourage take up. Yet, it is also instructive to consider how individual effort to move from System 1 to System 2 thinking could affect decisions to participate in a program. In terms of the initial presentation Stanovich and West (2000) and the elaboration in Kahneman (2011), System 1 refers to reasoning-based intuition; it is quick, automatic, implicit and emotional. System 2 refers to reasoning that is slower, analytical, logical and conscious. If an individual faces time and cost constraints, fails to notice available information, or retains a relatively small amount of information in their usable memory, they are more likely to use System 1 thinking, potentially resulting in costly errors (Milkman *et al.*, 2009).

As a thought experiment, consider a program that successfully addresses the common costs discussed above that prevent complete take up. Invoking findings from economics and behavioral science, the program administrators greatly reduce or eliminate learning, compliance and psychological costs. They expect that this will result in complete take up among eligible individuals. Yet, they find that there is still incomplete take up. In this context, the question becomes: how might moving from System 1 to System 2 thinking affect an individual's decision to participate in a program?

Milkman *et al.* (2009) offer relevant observations about how to move decisions from System 1 to System 2. First, System 2 thinking relies on replacing intuition with formal analytical processes. Second, taking an outside perspective has been shown to improve decision-maker judgement. Relatedly, encouraging people to explore the perspective opposite to theirs has been shown to reduce errors in judgment. Third, moving from separate to joint decision-making can move people from suboptimal System 1 decision-making to better System 2 thinking. All of

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these approaches have been shown to move System 1 decision-making in the direction of System 2. Yet, if the root cause of System 1 decisions is scarcity and a resulting bandwidth tax on cognitive capacity, it is unclear if any of these approaches will significantly affect judgement and behavior (Mullainathan and Shafir, 2013). In this case, 'nudges,' including automatic enrollment, may be leveraged as a mechanism to guide System 1 decisions to achieve better results (Thaler and Sunstein, 2003, 2008, 2021). We suspect that the various forms of choice architecture discussed here are more likely to increase take up rates than would be efforts to move people from System 1 to System 2 (noting that informational interventions might have that effect).

Conclusion

In this article, our aim has been to make two contributions to the literature on individual decision-making. The first is to understand why people fail to participate in programs that would appear to be unambiguously beneficial to them. The second is to explore approaches that might increase participation rates.

We have discussed three primary barriers to take up: learning costs, compliance costs and psychological costs. Take up is simultaneously reduced by an assortment of administrative burdens, including complexity, hassles and sludge. All of these can produce significant obstacles in the face of cognitive scarcity. Fully rational agents might well be deterred by administrative burdens, and if people suffer from behavioral biases, the effects of such burdens can be especially severe; present bias, procrastination, inertia and misperception of risk can turn administrative burdens into a kind of wall between people and programs. Public officials should take down that wall. Reducing the relevant barriers through improved choice architecture could significantly increase participation across a wide range of programs that seek to increase individual well-being and social welfare.

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