



Center for Social Development

GEORGE WARREN BROWN SCHOOL OF SOCIAL WORK

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REFUND TO SAVINGS 2015–2016: Field Experiments to Promote Tax-Time Saving in Low- and Moderate-Income Households

CSD Research Report No. 18-28



Washington University in St. Louis

The Refund to Savings Initiative is a collaboration of the
Center for Social Development at Washington University, Duke University, and Intuit, Inc.



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Low- and Moderate-Income Households

*Stephen P. Roll, Genevieve Davison, Michal Grinstein-Weiss,
Mathieu R. Despard, & Sam Bufe*

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Disclaimer

Statistical compilations disclosed in this document relate directly to the bona fide research of, and public policy discussions concerning, financial security of individuals and households as it relates to the tax filing process and more generally. Compilations follow Intuit's protocols to help ensure the privacy and confidentiality of customer tax data. The views and opinions expressed in this report are those of the authors and do not necessarily reflect the views and opinions of the funders.

Executive Summary

Refund to Savings 2015–2016: Field Experiments to Promote Tax-Time Saving in Low- and Moderate-Income Households

*Stephen P. Roll, Genevieve Davison, Michal Grinstein-Weiss,
Mathieu R. Despard, and Sam Bufo*

The Refund to Savings (R2S) Initiative is a collaborative effort of Washington University in St. Louis, Duke University, and Intuit, the makers of TurboTax. With the tools of behavioral economics, the initiative has constructed and tests low-touch, scalable interventions designed to encourage tax-time saving in an online tax preparation environment. Specifically, R2S encourages low- and moderate-income (LMI) tax filers to deposit some of their federal tax refund into a savings account.

The R2S Initiative embeds interventions within TurboTax Freedom Edition (TTFE), an online tax-preparation platform available for free to LMI filers. We randomly assign participants to intervention or control groups and thus are able to precisely identify the impacts of our interventions. Now in its sixth year (from 2012 into 2018), the initiative has led tens of thousands of additional households to deposit their tax refunds into savings. Past R2S experiments have shown that it is possible to increase rates of tax-time savings deposits among LMI filers through the use of framing and messaging strategies as well as anchoring and choice architecture (Grinstein-Weiss et al., 2015).

In 2013, the first full-scale R2S experiment explored the effects of motivational messaging prompts and suggested savings amounts (or, *savings anchors*) on the tax-time savings behavior of 680,545 TTFE users. We found that anchors are effective at increasing both the rate of refund savings deposits and the average amount of refund deposited to savings. We also found that messaging has positive but more modest effects (Grinstein-Weiss et al., 2015). In 2015 and 2016, the years covered in this report, we continued to examine different approaches to motivational messaging while also exploring the roles that choice architecture plays

in driving tax-time savings behavior. We tested these behavioral mechanisms on 646,116 participants in 2015 and on 284,125 in 2016. In the 2015 iteration of R2S, we also used an online, longitudinal survey to assess the effects of the interventions 6 months after tax filing. We administered the survey to a subset of participants at two points: Immediately after they filed their taxes and again 6 months later.

The 2015 and 2016 R2S experiments build on prior years by testing the effects of choice architecture and different messaging strategies on tax refund savings behavior. We found that, in 2015, a choice architecture making the option to deposit to savings more salient for tax filers, in combination with savings-focused messages, drove substantial increases in rates of depositing the tax refund to savings vehicles. In 2016, we attempted to separate the effects of choice architecture from the effects of messaging and found that choice architecture by itself increased tax-time savings deposits. The additional effects of messaging were minimal, but we found that messaging on emergency savings appeared to be more effective than messaging on the two other topics. The 2015 and 2016 interventions also found that refund-splitting rates—the rates at which filers split the refund by depositing it in more than one account—are quite low (less than 1% for all groups).

This report also details the effects of the 2015 R2S experiment 6 months after the point of tax filing. We found that treatment participants were generally no more likely than control-group participants to have any of the refund saved after 6 months, but a surprising finding emerged when we examined only the refund savings of nonstudents with persistent financial constraints: The percentage with any of

the refund saved after 6 months was higher among those exposed to any R2S intervention than among counterparts in the control group. And this effect was more pronounced among those who indicated at tax time that they could not access \$2,000 in an emergency. This suggests that the effects of the R2S interventions persist over 6 months and may disproportionately benefit the participants most in need of emergency savings.

Key Findings

- ❖ Across the 2015 and 2016 intervention years, **R2S generated 29,536 additional savers and an additional \$48 million deposited to savings** vehicles.
- ❖ Simply changing **the way refund deposit options were presented**—also referred to as choice architecture—**increased** rates of tax refund **savings deposits by 43%**.
- ❖ The savings **impacts of the R2S** interventions **persisted across 6 months** among nonstudents with persistent financial constraints.
- ❖ Messaging around **saving for emergencies appeared to be the most effective messaging prompt** and was particularly effective **among nonstudents who had persistent financial constraints** and no emergency savings at tax time.
- ❖ The overall **savings deposit rates** of TTFE filers have **increased in each year of the R2S Initiative**. This possibly indicates that once tax filers are nudged to deposit into savings accounts, these behaviors persist through subsequent years of tax filing.

Part 1

Background: Refund to Savings

The Refund to Savings (R2S) Initiative is an ongoing collaboration between academia and industry partners, including researchers from Washington University in St. Louis, Duke University, and Intuit, Inc., the makers of TurboTax. The purpose of the initiative is to leverage insights from the field of behavioral economics to develop low-cost, low-touch, scalable interventions to promote tax refund savings among LMI households. This research has been ongoing since 2012 and continues through the present day.

This report covers the design and impacts of the R2S experiments in the 2015 and 2016 tax seasons (which include the 2014 and 2015 tax years), and also includes results from a 6-month follow-up survey conducted in 2015 to assess how the impacts of R2S interventions persist over time. These interventions reached a large number of tax filers in both of these years; 646,116 in 2015 and 284,125 in 2016.

The 2015 and 2016 R2S interventions primarily explored the impact of two behavioral mechanisms (detailed below) on tax refund savings behaviors:

1. *Choice architecture*, or how the options in a given decision are structured and presented to the decision maker. Specifically, we investigated how providing a choice architecture that emphasized saving the entire tax refund impacted savings deposit behaviors.
2. *Persuasive messaging*, or how providing different types of messages or framing around decisions can motivate people to act. In 2015 and 2016, we explored how a variety of savings messages—including messages around emergencies, retirement, and general financial goals—impacted savings deposit behaviors.

By comparing interventions that incorporate choice architecture and persuasive messaging to promote savings with a control group that received no savings intervention, we are able to assess the causal impact of these interventions on tax-refund savings behaviors. We also compare savings behaviors across intervention conditions to better understand the relationships between different persuasive-messaging approaches and tax-refund savings behaviors.

Research Questions

- ❖ Do the R2S interventions impact refund-savings deposit behaviors at tax time?
- ❖ What are the contributions of choice architecture and persuasive messaging in driving savings deposits at tax time?
- ❖ What types of savings messages are the most effective at driving savings deposits?
- ❖ What is the overall impact of the R2S interventions 6 months after tax filing?
- ❖ Are the R2S interventions more effective for households with persistent financial constraints than for other sampled households?
- ❖ How does access to emergency savings moderate the 6-month impact of R2S interventions?

The R2S Initiative ... makes an effort to complement other asset-building programs by creating a set of **low-touch, scalable, flexible interventions** to encourage households to save their own money **at a key moment: when they are set to receive their tax refund.**

In the rest of this report, we first present the background and motivation for this research, and outline the prior research done on the R2S Initiative. Then we provide a detailed overview of the 2015 and 2016 experiments, the methods of analysis, and the impacts on tax-time savings deposits. Following the tax time analysis, we present the motivation for, methods of, and results from an analysis of the 6-month impacts of the R2S interventions. Finally, we present conclusions and detail several policy implications from this work.

The Importance of Saving in LMI Households

Public policies aimed at improving the financial well-being of low- and moderate-income (LMI) households typically pursue that goal through income-maintenance programs like Temporary Assistance for Needy Families, consumption-support programs like the Supplemental Nutrition Assistance Program, and work incentives like the Earned Income Tax Credit (EITC). Although these programs are valuable, income is only one component of financial well-being. Income- and consumption-maintenance programs can, for example, put food on the table or help parents to purchase necessities for their children, but they are generally inadequate at protecting households from financial emergencies or at facilitating long-term investments, including higher education, a down payment on a house, and the accumulation of retirement assets.

Since the mid-1980s, researchers, policymakers, and practitioners have increasingly recognized that building assets, or wealth, is an important component of helping LMI households emerge from poverty.

In *Assets and the Poor* (1991), Michael Sherraden laid the foundation for much of the asset building field and highlighted the ways asset building can improve social welfare. Assets enable long-term investments and afford protection when emergencies arise. But Sherraden also identified other mechanisms by which assets can improve the well-being of households. They enable households to focus on long-term financial goals and plan for the future. Assets foster positive expectations for one's future and for the future of one's children. They can make it possible to develop other assets (e.g., income or other assets accumulated as a result of investments in education or homeownership). And assets can influence personal efficacy—the belief in one's ability to succeed. Subsequent research has identified additional potential benefits for financially constrained populations: The accumulation of assets is associated with the reduction of stress and anxiety (e.g., Carter, Blakely, Collings, Gunasekara, & Richardson, 2009; Roll, Taylor, & Grinstein-Weiss, 2016) as well as with the improvement of decision making processes, improvement that stems from the reduction of financial constraints (Mullainathan & Shafir, 2013).

Despite the importance of savings to long-term financial security and overall well-being, research on the financial lives of American households has shown that many possess little or no savings. A study from Pew Charitable Trusts (2015a) found that 41% of all U.S. households could not cover a \$2,000 emergency expense and that 78% of low-income households could not cover one. A separate survey found that 26% of Americans had no emergency savings at all (Ross, 2014). A lack of basic emergency savings can leave households vulnerable to financial shocks such as job loss, unexpected medical expenses, or unexpected vehicle repair. And financial shocks are common: Pew

found that 60% of American households experienced one within the past year (Pew Charitable Trusts, 2015b). Households that cannot afford the cost of emergency expenses are at greater risk of incurring debt, including high-interest debt from such sources as payday loans, and are vulnerable to material hardship (Barr, 2012; Chase, Gjertson, & Collins, 2011; Couch, Daly, & Gardiner, 2011; Heflin, London, & Scott, 2011; Rawlings & Gentsch, 2008).

In addition to a lack of emergency savings, numerous other disparities distinguish LMI households from households with higher income: educational outcomes and attainment, homeownership rates, and retirement savings are particularly relevant in the current context. Engle and Tinto (2008) found that only 34% of low-income, first-generation college students earned their bachelor's degree within 6 years, but the rate was 66% among peers with higher incomes who were not first-generation college students. Another study found that, as of 2014, households in the top quintile of income were 2.2 times more likely to be homeowners than were those in the bottom quintile (Prosperity Now, n.d.-b). And in 2015, more than half of households earning less than \$40,000 per year had no savings for retirement; in comparison, about 30% of all U.S. households lacked retirement savings (Board of Governors of the Federal Reserve System, 2016).

Over the last 25 years, many efforts have been made to address these disparities. Prominent among them are Individual Development Accounts (IDAs) and Child Development Accounts (CDAs): IDAs tend to focus on low-income households and do not exclusively target children whereas CDAs were designed to be available to all children regardless of socioeconomic status. The money deposited into IDAs is fully or partially matched, and use of the accrued savings is restricted to investments for specified purposes (e.g., to finance housing, education, or the launch of a small business).

Many IDA programs also require account holders to participate in financial education.

In contrast, CDAs are typically savings or investment accounts seeded with an initial deposit and grown through parental contributions that may be matched. For example, the Harold Alfond College Challenge provides \$500 at birth to every child born as a resident of Maine (Prosperity Now, n.d.-a). Moreover, CDAs feature other components intended to improve the financial well-being of participants. Many provide some form of financial education and specify rules on how the CDA funds can be used (e.g., for higher education).

Evaluations of both IDA and CDA programs have found promising results. An experimental evaluation of an IDA program in Oklahoma found that IDAs increased the homeownership rates among renters by 7 percentage points (Mills et al., 2008). A more recent evaluation found that an IDA program in New Mexico and California increased median liquid assets held by participants and decreased their rates of hardship and alternative financial service use (e.g., check cashing; Mills et al., 2016). Research from CDA evaluations has been similarly positive. Incentives that the Canada Education Savings Program offered to encourage saving for children's postsecondary education have led to a steady increase in the amount of money that Canadian households save and to an increase in the amount of money they spend on education (Employment and Social Development Canada, 2015).

In the United States, Maine's NextGen plan offers matching grants to residents who open 529 college savings accounts, and an evaluation found that annual matching grants appear to be associated with higher annual savings (Clancy, Han, Mason, & Sherraden, 2006). The SEED for Oklahoma Kids experiment, a large-scale study of CDAs for randomly selected newborns in Oklahoma, found that the program increased the rate at which the treatment group

Figure 1. Average federal refund, housing payment, and monthly gross income. The figure shows averages for all participants in the 2016 Household Financial Survey and for those receiving the federal Earned Income Tax Credit. Monthly housing payment is shown for filers whose payment does not equal zero.

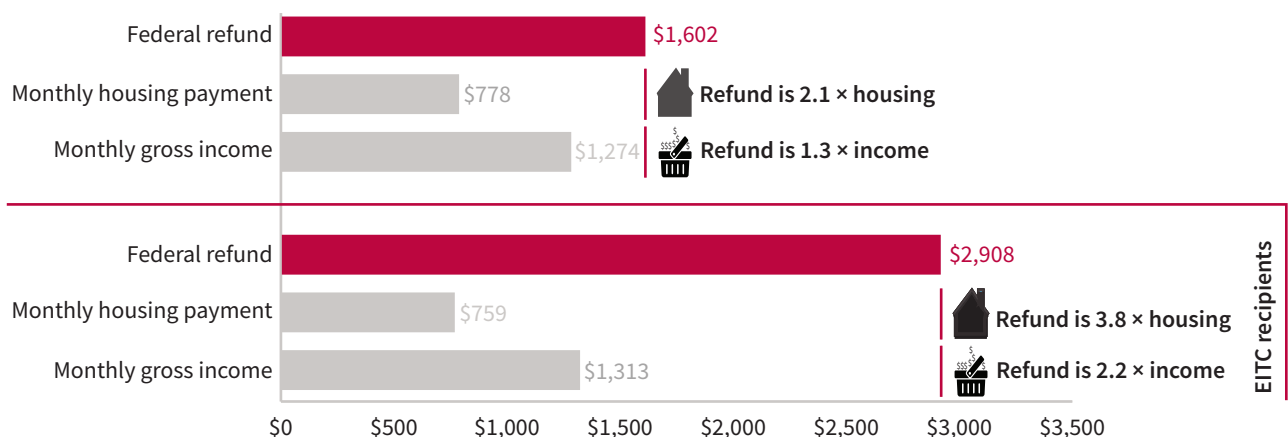


Table 1. Tools of Behavioral Economics Employed by the R2S Initiative from 2012 to 2016

Behavioral Mechanism	Details of Mechanism	Intervention Year
Decision framing and messaging	Individuals are susceptible to sudden shifts in perception, and these shifts can be based upon the way that information is presented. This form of cognitive bias is called a <i>framing effect</i> . The R2S Initiative has used several framing approaches over the years. Examples include reminding participants about the possibility of emergency expenses as well as asking them to think about their goals for the future and for retirement.	2012–2016
Anchoring	People have a tendency to stay on or near a suggested reference point. Anchoring is commonly experienced in negotiations involving “low-balling” or “high-balling” tactics. For example, a car dealer may set a high sticker price with the hope of increasing the final sale price. In 2012 and 2013, the R2S interventions suggested to participants that they should save a specific percentage of their refund (e.g., 50%) or a specific amount (e.g., \$250). The suggestion was designed to anchor the participant’s choice to a specific savings target.	2012–2014
Choice architecture	At the crucial moment when individuals weigh choices, the environment and its features can impact decisions. The R2S Initiative has altered the choice architecture of the deposit screen where TTFE users select how they want to receive their refund. Specifically, the option to deposit to savings was placed first in the list, and the option to save the entire refund was placed above the option to save a part of the refund.	2012–2016

Note. R2S = Refund to Savings Initiative; TTFE = TurboTax Freedom Edition.

opened accounts and deposited in them as well as the amount of savings (Zager, Kim, Nam, Clancy, & Sherraden, 2010). Other research has found that the program also impacted parents’ expectations for their children and led to improvements in a number of psychosocial outcomes (Huang, Sherraden, Kim, and Clancy, 2014; Kim, Sherraden, Huang, & Clancy, 2015; Wikoff, Huang, Kim, & Sherraden, 2015).

Although IDA and CDA programs have been successful in improving participant outcomes and should be scaled up to reach more households, they are ultimately high-touch efforts requiring consistent funding, infrastructure development (i.e., account maintenance, transmission of matching funds, rule enforcement), and political buy-in at large scales (i.e., at city, state, and national levels). The R2S Initiative—which is also guided by the perspective that assets and income are key components of financial security and well-being—makes an effort to complement other asset-building programs by creating a set of low-touch, scalable, flexible interventions to encourage households to save their own money at a key moment: when they are set to receive their tax refund.

Building Savings at Tax Time

Tax time has been identified as a “savable moment” for LMI households (Tufano, Schneider, & Beverly, 2005, 1). This is, in part, due to the fact that the tax refund is the largest lump sum payment many LMI households

will receive all year. Our research with R2S participants can put tax time’s importance into perspective: In 2016, the \$1,602 average federal refund received by our LMI study participants was equal to 2.1 times their average monthly housing payment and 1.3 times their average monthly gross income. For EITC recipients in our study, whose refunds averaged \$2,908 in 2016, these figures increased to 3.8 and 2.2, respectively (Figure 1). Many LMI households experience dramatic income constraints, and tax time may be the only point in the year when they can afford to save—that is, the only time when their income exceeds their expenses by enough to realistically allow them to set aside some money for emergencies or other financial goals (Barr, 2012; Grinstein-Weiss, Russell, Gale, Key, & Ariely, 2017).

Other factors make tax time opportune for promoting saving. Tax filing is a nearly universal experience in the United States. In the 2016 tax-filing season, the Internal Revenue Service processed 152,250,000 tax returns and issued 111,069,000 refunds. The average refund was \$2,860. What’s more, over a third of tax filers prepared their own tax return (Internal Revenue Service, 2016). Thus, online tax-preparation environments are attractive venues for promoting tax time saving. Tax time also presents an attractive opportunity for behavioral intervention because taxpayers who have filed their taxes know how much money they will receive through their refund but still have time to decide where to deposit it. The R2S Initiative seeks to intervene in that moment of decision.

Using Behavioral Economics to Promote Savings at Tax Time

As a means of encouraging filers to save their tax refund, the R2S Initiative uses the tools of behavioral economics to design savings interventions embedded within the TurboTax Freedom Edition (TTFE) tax-preparation platform. Research in behavioral economics has found that much of our decision making is not wholly rational; it is influenced by psychological, social, and emotional processes (Ariely, 2010, 2011; Becker, 1976; Caplan, 2000; De Bondt & Thaler, 1994; Kahneman, 2003; Kahneman & Tversky, 1979; List, 2004). However, our behavior is irrational in systematic and predictable ways. By using behavioral principles to structure the environment in which individuals make tax filing decisions, we can encourage them to save the tax refund. Over the years, R2S has explored the use of a number of behavioral tools: framing to influence decisions through persuasive messaging, anchoring, and using choice architecture (see Table 1 for an overview of interventions across the years). This section provides background information on the tools.

Decision Framing and Messaging

Presenting information in a certain way, or *framing* it, has been shown to influence behavior (Epley, Mak, & Idson, 2006). For example, people have a tendency to discount the future when making decisions (Benhabib, Bisin, & Schotter, 2010), and this may explain why many do not save enough money for retirement (Diamond & Köszegi, 2003). People also tend to assume that their life circumstances will improve in the future (Bryan & Hershfield, 2012), an assumption that may cause them to underestimate the likelihood of financial shocks such as car repairs, medical expenses, and job loss.

Anchoring

Anchoring refers to the use of informational markers or points of reference to influence decisions involving the selection of a value (Munro & Sugden, 2003; Sen, 1993; Tversky & Kahneman, 1974). When anchors are provided, people have a tendency to stay on or near the anchor (Simmons, LeBoeuf, & Nelsom, 2010). For example, minimum payment thresholds for credit cards can function as anchors that bias households toward making payments closer to these minimums (Hershfield & Roese, 2015). Other research has found that higher retirement savings cues provided in emails are associated with increases in retirement savings contributions (Choi, Haisley, Kurkoski, & Massey, 2017).

Choice Architecture

Choice architecture involves the organization of decision environments to influence choice, often in ways that do not restrict the actual choices available (Thaler & Sunstein, 2008). A list of options is an example of choice architecture; the architecture, or order of choices, can be configured to suggest the optimal choice—such as by placing an option first to maximize its salience. A now classic example comes from the presentation of choices in a cafeteria checkout line: Placing healthy items first in the line and unhealthy choices last increases the likelihood that consumers will purchase the healthy options and reduces the likelihood that they will purchase the unhealthy ones (Thaler & Sunstein, 2008). Other examples of choice architecture interventions include presenting information about a choice or purchase in a clear and salient way (e.g., nutritional labeling) and providing instantaneous feedback on an action (e.g., cars that use noisy alerts if a rider is not wearing a seat belt). Choice architecture has been effectively applied in a number of contexts, including Medicare drug plans (Congdon, Kling, & Mullainathan, 2011) and retirement savings (Thaler & Benartzi, 2004).

Prior R2S Research on Tax Time Savings

Piloted in 2012, the R2S Initiative examined the effects of anchoring and messaging on tax-time savings behavior among LMI tax filers (Grinstein-Weiss et al., 2017). Specifically, the pilot experiment randomly assigned 107,632 TTFE users to a control condition or one of eight intervention groups. Each of the eight interventions exposed group members to a suggestion that they save a percentage of the refund (either 25% or 75%). The suggestion was intended to anchor the filers to the suggested amount. Two groups received no additional messaging prompt, and six groups saw one of three messaging prompts: one on emergency savings, one on financial goals, or one on retirement. The 2012 pilot found that the likelihood of placing a portion of the refund into a savings vehicle and the amount deposited into a savings vehicle (i.e., a savings account or U.S. savings bond) was greater among participants in any intervention group than among counterparts in the control group. The pilot also found that the amount of refund deposited to savings was associated with the anchor shown: Those shown the 75% anchor deposited more than those shown the 25% anchor. However, the effects of the different messaging prompts were quite weak, showing little to no impact on savings deposits.

The 2013 R2S experiment expanded on the 2012 pilot's design by testing four messaging conditions

In 2016, the **\$1,602** average federal refund received by our LMI study participants was equal to **2.1 times their average monthly housing payment** and **1.3 times their average monthly gross income**. For recipients of the EITC, these figures increased to **3.8 and 2.2, respectively**.

and five different savings anchors on 680,545 TTFE filers (Grinstein-Weiss et al., 2015). The messaging conditions included a generic prompt encouraging saving but not mentioning any specific motive to save, an emergency prompt highlighting having enough savings to weather an emergency, a family prompt encouraging filers to think about the current or future needs of their family, and a future prompt giving filers general encouragement to save for the future. The savings anchors shown to tax filers included suggested savings amounts of 25% of the refund, 50% of the refund, 75% of the refund, \$100, and \$250.

Analyses of the 2013 R2S experiment showed that the anchors increased rates of tax time savings deposits by 0.8 to 1.2 percentage points and that higher anchors were associated with greater rates of savings deposits. In addition to demonstrating that the rates of saving were higher among filers shown the emergency and future prompts than among counterparts shown the generic prompt, the 2013 interventions increased the total amount deposited to savings and the rate of splitting the refund between a savings account and some other account.² The overall rate of refund splitting among all treatment groups was fairly low (1.55%).

The 2013 research also examined the impacts of the R2S interventions 6 months after households filed their taxes. We found that participants in intervention groups with higher anchors were more likely than control-group members to report having some of the refund saved after 6 months (e.g., 30% of participants in the 75% anchor group and 26% of the control group still had some refund saved), and participants in those intervention groups saved a higher proportion of their refund (e.g., 19% of the 75% anchor group vs.

15% of the control group). Both at HFS1 and at HFS2,³ the percentage of filers reporting that they could come up with \$2,000 in an emergency was higher among those in the 75% anchor group than among counterparts in the control group (Grinstein-Weiss et al., 2015). Taken together, these results suggest that the impact of the R2S interventions extends at least 6 months beyond tax time.

Because access to a savings vehicle is an essential part of the decision to save one's refund, the 2013 R2S interventions tested whether it was possible to induce filers who lacked a savings account to open one. The analyses indicated that the share of filers who lacked a savings account at tax time but had one 6 months later was greater among those assigned to an R2S intervention than among counterparts in the control group (Despard, Grinstein-Weiss, Guo, & De Ruyter, 2018). Finally, analyses with the 2013 data compared R2S participants who deposited any of their refund into savings with counterparts who deposited nothing, examining reported experiences of various hardships in the 6 months following tax filing. Filers who deposited any of the refund into savings were found to be less likely to report that they experienced food insecurity or material hardship (Grinstein-Weiss et al., 2016).

Part 2

The Tax-Time Savings Experiments

The 2015 and 2016 R2S Interventions

The yearly, iterative nature of the R2S Initiative allows the research team to build on prior interventions in each subsequent year. The next two sections describe the 2015 and 2016 interventions as well as efforts to build upon prior experiences. In our analysis of data from both of these intervention years, we have sought to answer the following primary research questions:

- ❖ Do the R2S interventions impact refund savings deposit behaviors at tax time?
- ❖ What are the contributions of choice architecture and persuasive messaging in driving savings deposits at tax time?
- ❖ What types of savings messages are the most effective at driving savings deposits?

In supplemental analyses, we also examined the overall incremental impact of these interventions on aggregate savings deposits and the total amount of the refund deposited into savings accounts. We further trace the results of the R2S interventions over time and explore the implications of these results for the long-term impacts of tax-time savings interventions.

The 2015 R2S Interventions

In 2013, the R2S interventions were largely oriented around using anchoring techniques to encourage filers to deposit a suggested amount of their refund into savings vehicles and to deposit the remainder into some other account. Although the interventions were effective at increasing the number of people who made savings deposits at tax time, only 1.55% of participants split the refund. This suggested that people prefer to deposit the refund into a single account.

The 2015 interventions therefore shifted the focus away from splitting, instead encouraging participants to deposit the *entire* refund into savings vehicles. The 2015 interventions also incorporated interactive messaging prompts in which filers could indicate their savings goals on the refund-deposit screen. These were designed to further motivate filers to save.

Participants were randomly assigned to a control group or one of three intervention groups. The interventions combined an intentionally configured choice architecture with different messaging strategies designed to encourage saving. In contrast, the control group was exposed to the three deposit options shown in Figure 2: Filers could transfer the refund into a bank account by direct deposit, receive the refund via a paper check, or split the refund across multiple accounts.⁴ Although filers could deposit their refund into a savings account after they selected the bank account option, the control condition did not specifically emphasize saving.

By contrast, each of the three 2015 intervention conditions configured choice architecture to emphasize the two savings options: The first—and likely the most salient—savings option was to deposit the entire refund

Figure 2. Deposit options shown to the control group (2015).

How would you like to get your federal refund?

Direct deposited to my bank account

 The fastest ways to get your refund!

To a paper check

Split into multiple accounts (or on U.S. Series I Savings Bonds)

into a savings account, functionally anchoring filers to save 100% of their refund. The second option invited filers to split their refund between a savings account and some other account. Figure 3 presents a screenshot showing one of the three intervention conditions (the other two are shown in Appendix A of this report).

Each of the three intervention conditions employed a different messaging strategy. Messages in the first condition emphasized the importance of saving for emergencies (the Precautionary Saving condition), messages in the second one used an interactive prompt to encourage participants to think about future goals (the Interactive Goal condition), and messages in the third condition used an interactive prompt to encourage thinking about hopes for retirement (the Interactive Retirement condition). The interface allowed the user to click on an image associated with each goal.

The 2016 R2S Interventions

As this report shows, changes to the choice architecture in 2015 led to strong increases in the rate at which filers deposited their tax refund into a savings vehicle. However, we noticed that the overall levels of interaction with the interactive messaging prompts were low: Only 1.4% of filers clicked on the interactive prompts in the Interactive Goal condition, and only 0.5% clicked on the prompts in the Interactive Retirement condition. The 2016 interventions therefore built on the 2015 work by developing interventions designed to enhance the effect of messaging. It also structured the interventions to get clear experimental reads on the impact of different types of messaging.

For the 2016 intervention, filers saw either the control condition or one of three treatment conditions that emphasized saving the refund (Figures 4, 5, and 6).⁵ The three treatment conditions in 2016 sought to allow a comparison of the effects of choice architecture alone and its effects in combination with different messaging approaches. Language in the two messaging conditions referenced saving for emergencies. Participants in one, the Choice Architecture + Noninteractive Emergency Messaging group, were shown a passive prompt with messaging around the need for emergency savings. Participants in the other, the Choice Architecture + Interactive Emergency Messaging group, were shown an interactive prompt that invited them to identify their emergency savings needs. To overcome the lack of engagement with the 2015 prompts, the 2016 experiment attempted to increase the salience of this interactive element; the message was put on its own screen (in 2015, it was shown on the side of the deposit screen), and the choices made there were incorporated into a second messaging prompt on the filing screen (see Figures 7 and 8 for illustrations). Interaction with

Choose how you'd like your federal refund

Saving some of all your refund is an excellent way to set aside money to achieve your goals.

Figure 3. Deposit screen shown to the Interactive Goal intervention group (2015). This intervention is an example of choice architecture combined with an interactive prompt.

Choose how you'd like your refund

Figure 4. Deposit options shown to the control group (2016).

Choose how you'd like your refund

Figure 5. Deposit screen shown to the Choice Architecture intervention group (2016). This condition only utilized choice architecture.

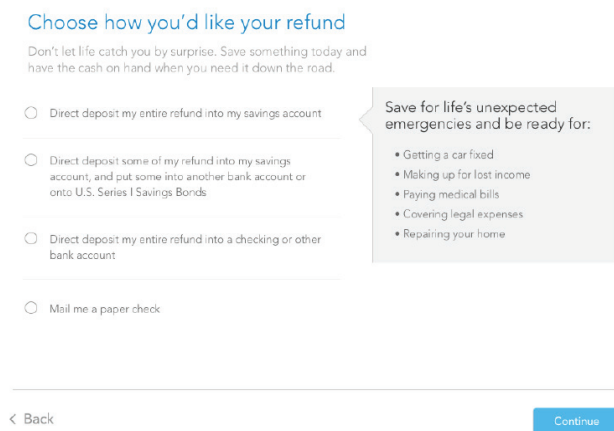


Figure 6. Deposit screen shown to the Choice Architecture + Emergency Messaging intervention group (2016). This condition used both choice architecture and a noninteractive prompt to promote saving.

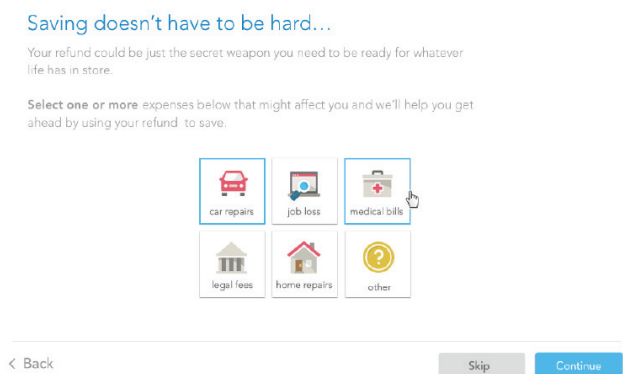


Figure 7. The first deposit screen shown to the Choice Architecture + Interactive Emergency Messaging intervention group (2016). This condition used an interactive prompt on its own screen to encourage participant engagement with the message.

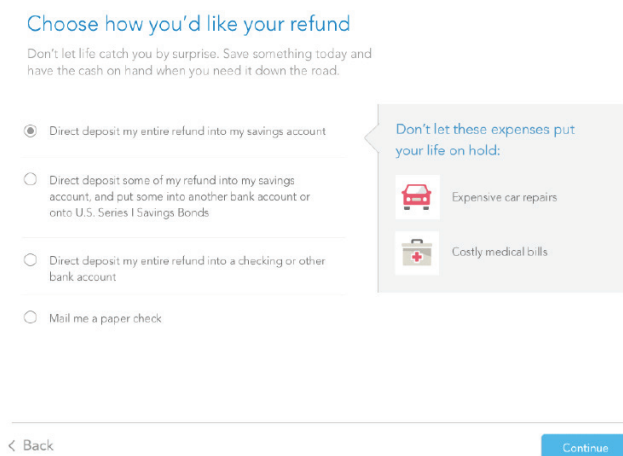


Figure 8. The second deposit screen shown to the Choice Architecture + Interactive Emergency Messaging intervention group (2016). The second screen incorporated any selections made on the first screen into another, noninteractive prompt emphasizing emergency saving as well as choice architecture.

the prompt was not required, however, and filers could skip the screen if they chose. In addition to encouraging savings deposits among LMI tax filers, a goal of the 2016 savings interventions was to isolate the effects of choice architecture independent of those from messaging while comparing a messaging strategy that strongly promoted participant engagement with one that did not.

Methods

Sample and Data

Participants

The thresholds to qualify for the TTFE product change slightly from year to year. In general, filers must receive the EITC, have relatively low income, or be on active military duty and have income below a specified threshold. In 2015, tax filers qualified for TTFE if they had an adjusted gross income (AGI) of less than \$31,000, if they qualified for the EITC, or if a member of their household was on active military duty and the household had an AGI of less than \$60,000. In 2016, the EITC and general income thresholds remained the same, but the qualifying military AGI threshold was \$61,000. In each year, most TTFE filers qualified by meeting the general income-threshold requirement.

Both the 2015 and the 2016 experiments ran for the entirety of their respective tax seasons. The total sample in 2015 consisted of 646,116 participants who filed their taxes with TTFE and received a tax refund. In 2016, the sample consisted of 284,125 TTFE tax filers who received a refund.⁶

Data Collection

The R2S Initiative draws data from two primary sources: administrative tax data on TTFE filers and longitudinal data from the HFS. Participation and response rates are summarized in Table 2.

Administrative Tax Data from TTFE.—Intuit provides the aggregated, anonymized administrative data on all TTFE users receiving refunds. This data set includes information on filing status (e.g., single, married and filing jointly, or married and filing separately), number of dependents, age, income, tax credits, tax deductions, and amount of refund received. The data set also includes indicators identifying the experimental condition to which each filer was assigned and, if applicable, how each interacted with the intervention (i.e., whether the filer clicked on an interactive messaging prompt). In addition, a variety of measures indicate how filers allocated their refund: how they chose to receive their refund (e.g., direct deposit or paper check), whether they split the

Table 2. Participation and Response Summary by R2S Data Source

Data	R2S Intervention Year	
	2015	2016
Tax-time experiment		
No. of control participants	161,952	70,978
No. of treatment participants	484,164	213,147
Household Financial Survey		
% of TTFE filers offered survey	50.0	50.0
HFS1 take-up rate	4.6	5.4
HFS2 take-up rate	34.3	42.3

Note. R2S = Refund to Savings Initiative; TTFE = TurboTax Freedom Edition; HFS1 = Household Financial Survey, first wave; HFS2 = Household Financial Survey, second wave.

refund, whether they purchased U.S. savings bonds, and whether they deposited any of the refund into a savings vehicle, as well as the amount of refund deposited to savings or checking.

For the general impact evaluation of R2S, the research team uses this aggregated, deidentified tax data on hundreds of thousands of TTFE tax filers. Provided by Intuit in a manner consistent with U.S. laws and regulations, these data enable the team to analyze the filing behavior of different groups (e.g., the control and treatment groups, filers who claim the EITC and those who do not). We also receive individual-level tax data on TTFE filers who consent to share their administrative data and participate in the HFS.

Longitudinal Data from the HFS.—Immediately after participants submit their tax returns, a screen in TTFE randomly invites half of refund-receiving filers to participate in the HFS. Administered using Qualtrics online software, the HFS takes about 20 minutes to complete. Participants are allowed to skip questions, and they receive a \$5 online Amazon.com gift card as compensation for their participation. After filing their taxes, 14,993 R2S participants completed HFS1 in 2015, and 5,146 of these completed HFS2. In 2016, 13,316 R2S participants completed HFS1 and 5,636 completed HFS2.⁷

The HFS covers a wide array of financial topics, querying participants about what they plan to do with their tax refund, how much debt they owe, the value of their assets, whether they could come up with \$2,000 in an emergency, their experiences with material hardship, and whether they have faced financial shocks. Six months after filing their taxes, those who participated in HFS1 are invited to complete HFS2, which asks about their actual use of the refunds and any changes in financial status. At the

beginning of the survey process, participants grant consent enabling Intuit to share the individual-level tax data. This ensures that R2S researchers have robust administrative tax data for every HFS participant.

Analytical Strategy—Tax Time Impact

Evaluating the impact of R2S on tax-time savings behaviors is fairly straightforward. The randomization of TTFE filers into a control group and intervention conditions should minimize the imbalance between groups, and so we estimated the impact of R2S through an intent-to-treat measure that captured the average impact of the intervention for each treatment group relative to that for the control group:

$$ITT = \bar{Y}_O - \bar{Y}_C, \quad (1)$$

where Y_O was the average outcome for the group exposed to the R2S interventions, and Y_C was the average outcome for the control group. Outcomes explored in this analysis included the rate at which filers deposited the refund into a savings vehicle, the amount deposited into savings, the rate at which they split the refund between a savings vehicle and a different account, and the rate at which they deposited the entire refund to savings.

R2S Results

Participant Characteristics

In total, 646,116 TTFE users participated in the R2S experiment in 2015 and 284,125 participated in 2016. The reported characteristics of the two groups were similar. As Table 3 shows, the mean age of TTFE was around 35 years, about two thirds filed as single, around 30% had dependents, and the average household AGI was between \$14,000 and \$15,000.⁸

The refund-related characteristics of the two groups were also similar across 2015 and 2016. The average federal tax refund was around \$2,000. Filers had about \$420 in tax liability and withheld around \$1,100. Approximately 40% received the EITC, and the average EITC was around \$2,300. About 11.5% deposited any of their refund into a savings vehicle, and very few filers split their refund between accounts.

Understanding the Financial Lives of Filers Through the HFS

As described previously, the HFS provides a wealth of information regarding the financial lives of TTFE users. This includes data on account ownership, access to credit, experience with hardship, employment status, demographic information, and use of

Table 3. Characteristics of R2S Participants (2015 and 2016)

Characteristic	% or Mean (SD)	
	2015	2016
Age (mean, in years)	35.3 (15.5)	35.3 (16.2)
Filing status (%)		
Single	66.8	68.6
Head of household	22.9	22.2
Married, filing jointly, widow(er)	9.4	8.4
Married, filing separately	0.9	0.8
Any dependents (%)	31.4	29.5
No. of dependents (mean)	0.5 (0.9)	0.5 (0.9)
Adjusted gross income (\$)	14,846 (9,896)	14,409 (9,902)
Tax-related characteristics		
Federal tax refund (\$)	2,030 (2,379)	1,955 (2,375)
Federal tax liability (\$)	422 (706)	423 (707)
Amount withheld (\$)	1,077 (1,138)	1,078 (1,139)
% receiving EITC	41.9	39.6
EITC amount (\$)	2,358 (1,923)	2,357 (1,923)
% depositing any refund into savings	11.7	12.2
% who split refund	2.2	1.5
Observations	646,116	284,125

Note. R2S = Refund to Savings; TTFE = TurboTax Freedom Edition; EITC = Earned Income Tax Credit.

Table 4. Household Financial Survey Participant Characteristics (2016)

Characteristic	% or \$
Owns savings account	73.4
Owns checking account	93.6
Owns credit card	66.7
Median credit debt (\$)ª	200
Median liquid assets (\$)ᵇ	720
\$2,000 in emergency	49.2
Used alternative financial services	27.4
Transaction servicesᶜ	17.4
Credit servicesᵈ	18.2
Student	32.8
Employed	77.0
Race	
White, non-Hispanic	72.1
Black, non-Hispanic	7.7
Asian, non-Hispanic	4.9
Hispanic	9.6

Note. N = 13,316.

ª Respondents who did not own credit cards were listed as having \$0 in credit card debt.

ᵇ Includes value of savings account, checking account, and cash on hand.

ᶜ Includes check cashers, money orders, and wire transfers.

ᵈ Includes payday loans, pawn shops, auto-title loans, rent-to-own services, and payroll cards.

alternative financial services such as payday loans or check cashers. As Table 4 illustrates, a majority of HFS participants in the 2016 HFS1 owned savings or checking accounts, although the rate of savings-account ownership lagged behind that of checking-account ownership. Almost 70% owned a credit card, about a third were students, and over three fourths were employed. Looking specifically at the financial characteristics of this sample, we see that most members were fairly liquidity constrained. The median reported liquid assets for participants was \$720, with \$200 in median credit card debt. Just under half of participants said they could come up with \$2,000 in an emergency. Overall, participants in the 2016 R2S closely resembled participants in 2015.

The HFS also provides information on financial shocks and material hardships that participants encountered in the 6 months prior to the survey. In total, 54.2% of participants in the 2016 HFS reported experiencing a financial shock in the 6 months prior to the survey. As Figure 9 illustrates, the most commonly reported shocks were unexpected car repairs (31.1%) and unexpected reductions in income (21.1%). The prevalence of reported material hardship was even more troubling. Over 60% of participants reported experiencing a hardship in the 6 months prior to the survey. Forty percent reported skipping a bill, 27.9% experienced food insecurity, and 16.0% were unable to pay their full rent or mortgage (Figure 10). Additionally, substantial percentages of respondents skipped some sort of health care service—a doctor visit, a dentist visit, or getting a prescription filled—because they could not afford it. Taken together, these results suggest that financial shocks were common among the 2016 HFS participants but that they had limited assets and limited access to emergency resources to manage these shocks. The findings therefore illustrate the challenge and the importance of the R2S Initiative. This population, although likely to benefit from increased savings, may also struggle to cover day-to-day expenses. Those struggles make saving difficult.

The Impact of R2S at Tax Time

The Impact of the 2015 R2S Interventions

Figure 11 illustrates the impact of R2S interventions on the key outcome variable in the experiment: The rate at which filers deposit any of their tax refund into a savings vehicle. Relative to the control group, all 2015 R2S treatment conditions substantially increased the total rate of filers depositing any of their refund to a savings vehicle. In the control group, 8.5% of filers deposited any of the refund to savings. In comparison, some portion of the refund was deposited to a savings vehicle by 13.4% of the

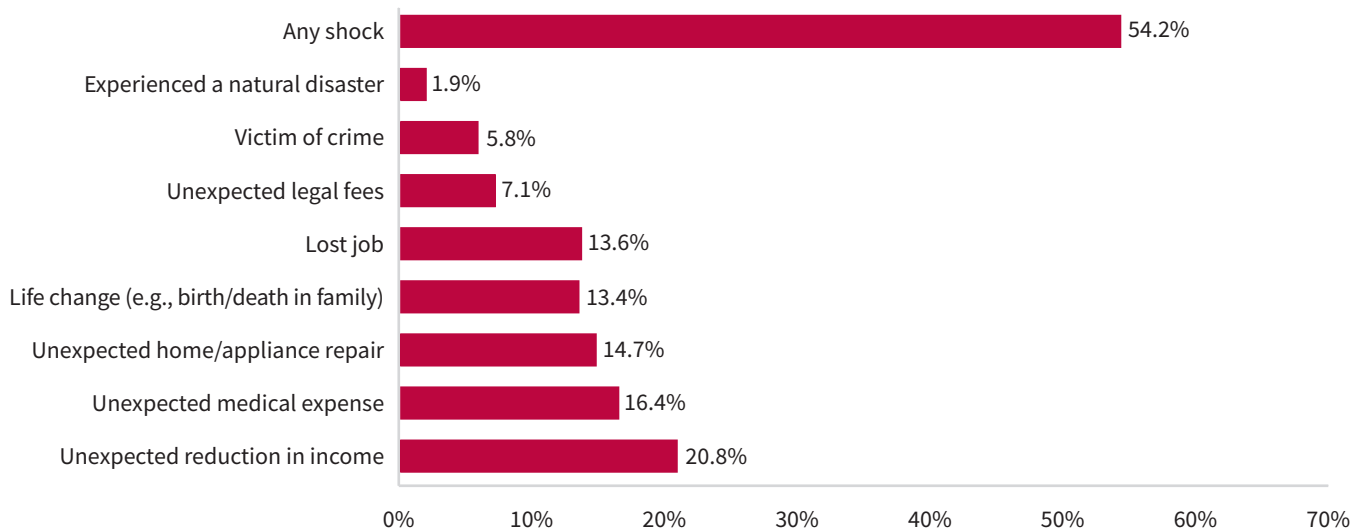


Figure 9. Percentages of 2016 Household Financial Survey participants who reported experiencing any financial shock and particular financial shocks ($n = 13,316$).

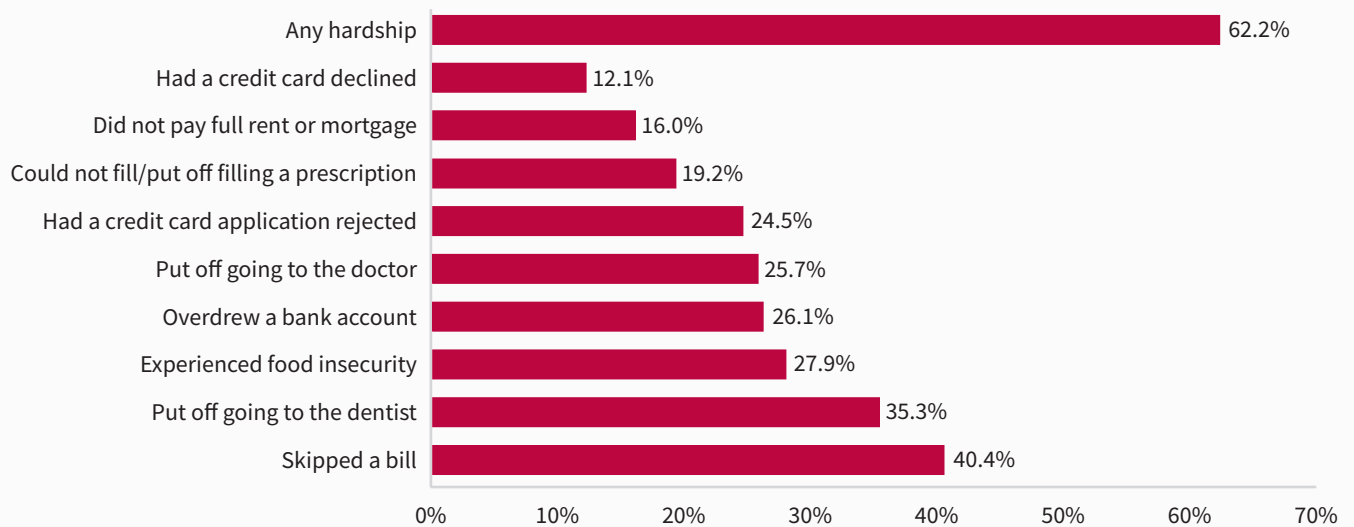


Figure 10. Percentages of 2016 Household Financial Survey participants who reported experiencing any hardship and particular hardships in the prior 6 months ($n = 13,316$).

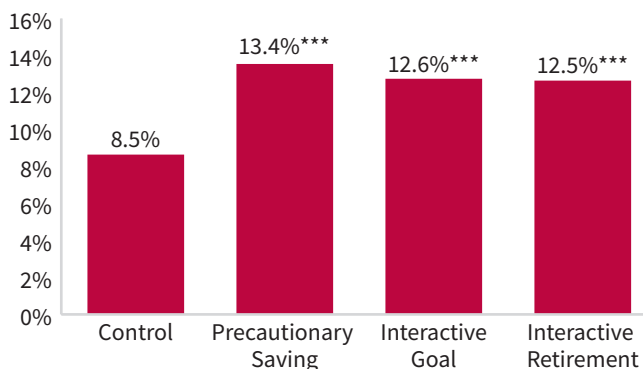


Figure 11. Rate of depositing any of the refund to a savings vehicle, 2015 ($N = 646,116$).

*** $p < .001$ (different from control).

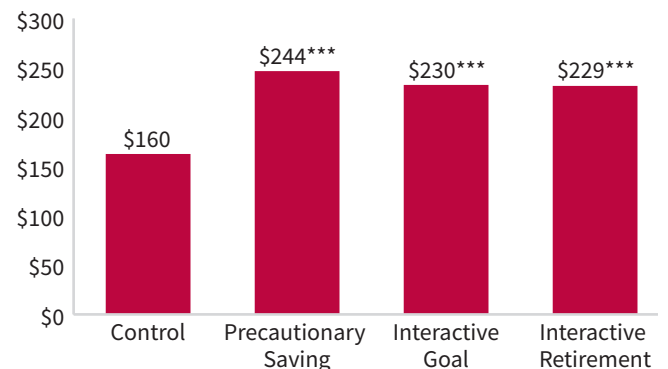


Figure 12. Dollar amount deposited to savings vehicles, 2015 ($N = 646,116$).

*** $p < .001$ (different from control).

Precautionary Saving intervention group, 12.6% of the Interactive Goal group, and 12.5% of the Interactive Retirement group. The impacts were highly significant across all intervention conditions. Precautionary Saving, the condition with the largest effect, included an emergency savings message, and exposure to that condition led to a 58% increase in the rate of refund savings deposits. This condition was also significantly more effective than the two interactive conditions, though the absolute differences were not large.

As Figure 12 illustrates, the 2015 R2S interventions increased the average amount of refund deposited to savings, and the average for each of the three treatment groups was significantly higher than that for the control group. In the most effective condition, the Precautionary Saving intervention, filers deposited \$244 to a savings vehicle on average; in comparison, the average deposited by the control group was \$160, a 53% difference. The other two conditions increased average savings deposits by similar levels.

Given the finding that the 2015 interventions increased both the rate of savings deposits and the amount deposited, it is important to understand whether the savings increases were driven by increases in the *amount* deposited to savings or simply by the increases in the *rate* of savings deposits. To assess this, we focused on the amounts deposited into savings vehicles by those who opted to make savings deposits, finding that the average savings deposits by savings depositors in the control group (\$1,886) were significantly higher than those by depositors in the treatment groups: On average, the Precautionary Saving depositors placed \$1,824 of the refund into savings vehicles, the Interactive Goal depositors placed \$1,817 into savings, and the Interactive Retirement depositors placed \$1,834 into savings. This indicates that the impact of the R2S interventions stemmed not from encouraging filers to deposit more of their refund into a savings account but rather from encouraging more people to deposit their refund into savings.

Figure 13. Rate of splitting between multiple accounts, 2015 (N = 646,116).

*** $p < .001$ (different from control).

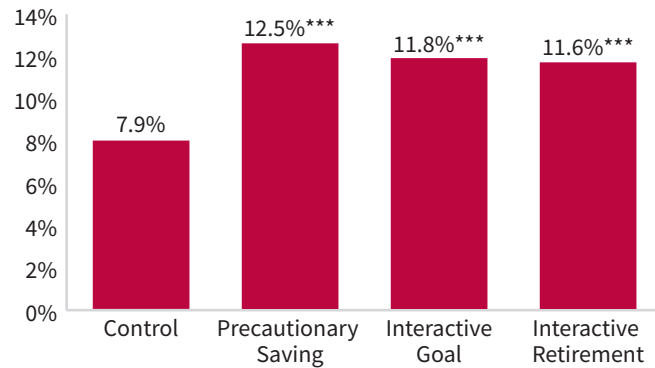
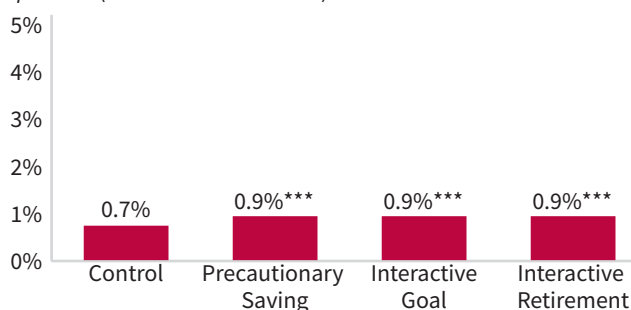


Figure 14. Rate of filers depositing whole refund to savings vehicle, 2015 (N = 646,116).

*** $p < .001$ (different from control).

Figures 13 and 14 illustrate why this might be the case. Figure 13 depicts the rates at which filers split their refund between a savings account and some other account, and Figure 14 shows the rates at which filers deposited their entire refund into a savings account. Taken together, these results show that the most typical behavior among those who deposited any of the refund to a savings account was to deposit the entire refund into savings. Around 12% of tax filers in the treatment groups chose the option of depositing the entire refund into a savings account, and approximately 1% split the refund into more than one account. This further suggests that the impact of the R2S interventions is extensive rather than intensive; that is, the interventions drive more people to make savings deposits, rather than driving people to deposit more to savings. This result is to be expected in an environment where people's preferences are to deposit solely into one account.

However, these results indicate that the R2S interventions also increased the rate of splitting. Around 0.9% of the treatment condition filers split their refund, compared to 0.7% of the control filers. This may be due in part to the fact that the choice architecture of the 2015 intervention emphasized splitting, which was the second option given in the treatment conditions. In the control condition, the splitting option was shown at the bottom of the list and did not mention saving. Despite this difference, it is worth noting that overall rates of splitting were low across conditions.

The Impact of the 2016 R2S Interventions

In general, the results from the 2016 R2S savings interventions ($n = 284,125$) were similar to those from the 2015 experiment. In each intervention group, the percentage of tax filers depositing any of their refund into a savings vehicle was higher than the percentage of control-group filers who did so (Figure 15). Specifically, 9.2% of filers in the control group deposited any of their refund to savings; the same was true of 13.2% in the Choice Architecture group, 13.4% in the Choice

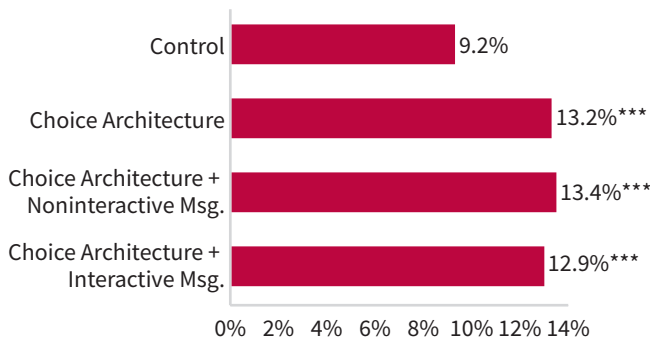


Figure 15. Deposits to savings: All interventions, 2016 (n = 284,125). Msg. = message.

***p < .001 (different from control).

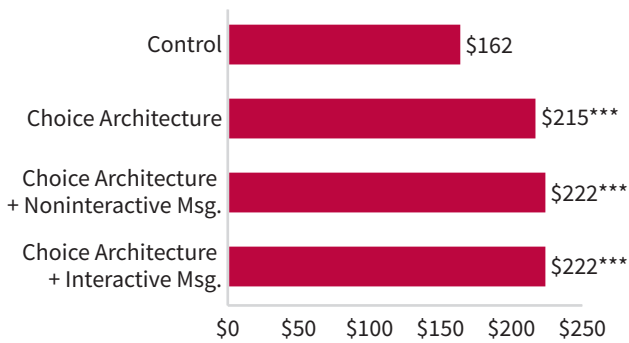


Figure 16. Average savings deposits by intervention, 2016 (n = 284,125). Msg. = message.

***p < .001 (different from control).

Architecture + Noninteractive Emergency Messaging group, and 12.9% in the Choice Architecture + Interactive Emergency Messaging group. Interestingly, the effects of choice architecture alone appear to be similar to the effects of combining choice architecture with emergency messaging. This suggests that the choice architecture element of the intervention may be the primary driver of the increased savings deposits.

In 2016 as in 2015, average savings deposit amounts were higher for all intervention groups than for the control group (Figure 16). Both of the groups exposed to a combination of choice architecture and emergency messaging had average savings deposits of \$222. The average for the control group was \$162, and that for the Choice Architecture group was \$215. Again, we see that the effect of choice architecture by itself was similar to the effect of combining choice architecture with emergency messaging.

Finally, the 2016 R2S interventions enabled us to document a highly significant increase in the percentage of filers depositing their entire refund into savings (Figure 17). The percentage of filers depositing the whole refund into savings was highest among the Choice Architecture + Noninteractive Emergency Messaging group (12.84%) and lowest among counterparts in the

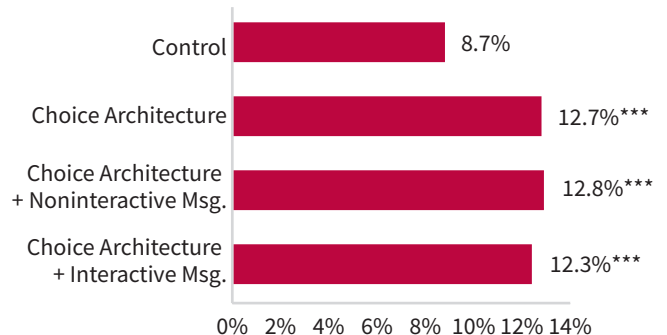
control group (8.74%). As with the other results, the effects of the Choice Architecture condition were similar to those of the two conditions combining choice architecture with emergency messaging.

We also examined the impact of the interactive messaging prompt itself. As noted above, one innovation implemented in 2016 was to incorporate a highly salient interactive messaging prompt that encouraged filers to identify the types of emergencies for which they would be saving their refund. This was motivated by two findings from the 2015 iteration of R2S: First, emergency messaging was more effective than other messaging related to financial goals (either general goals or retirement goals), and second, filers did not interact with prompts placed on the same screen where they were asked to select how they would like the refund to be deposited. To address these issues, the 2016 interactive emergency messaging prompt was placed on its own screen rather than on the deposit screen. However, filers assigned to the 2016 Choice Architecture + Interactive Emergency Messaging condition were not required to interact with the prompt.

The results from that intervention showed that a higher percentage of filers interacted with the prompt when it was shown on its own: 7.3% of filers interacted with it in 2016, but only 1.0% did so in 2015. This suggests that placing the prompt on a screen of its own increased the salience of the messaging. Despite this, the interactive prompt did not seem to be successful in driving tax-time savings behavior. As noted above (Figure 15), refunds were deposited into savings by 12.93% of filers who saw the prompt as part of the Choice Architecture + Interactive Emergency Messaging condition and by 13.21% of those assigned to the Choice Architecture condition (with no message, a nonsignificant difference of .28 percentage points). When compared with the Choice Architecture + Noninteractive Emergency Messaging condition, which drove 13.44% of filers to make savings deposits, the Choice Architecture + Interactive Emergency Messaging condition actually

Figure 17. Percentages of filers depositing the entire refund into savings, by intervention, 2016 (N = 284,125). Msg. = message.

***p < .001 (different from control).



led to a statistically significant 0.51 percentage-point reduction in the rate at which filers deposited into savings ($p < .01$). This lack of observed impact held when we restricted the analyses to those who interacted with the prompt, and it also held when we used regression techniques to control for the factors that might be associated with choosing to interact with the prompt.⁹

Discussion of the 2015 and 2016 R2S Interventions

The goal of the R2S interventions in both 2015 and 2016, as in 2013, was to increase refund savings deposits among TTFE users at tax time in order to improve this population's financial well-being. The 2013 intervention tested the effects of motivational messaging and anchoring on tax-time savings deposits, finding that the behavioral economics tools increased the rates at which filers saved and split their refund as well as the average amount deposited into savings. The 2015 and 2016 interventions built on these findings by testing the effects of choice architecture and additional messaging strategies. Our analyses of data from both years found that each tested treatment yielded higher rates of savings deposits and higher amounts deposited to savings. Although the overall behavioral shifts effected through these low-touch interventions are impressive, the scale of the interventions leads to a substantial aggregate impact for the R2S population. Across the 2015 and 2016 intervention years, R2S generated 29,536 additional savers and an additional \$48 million deposited to savings vehicles (see Figure 18).

Results from the 2015 R2S intervention suggested that choice architecture and each of the three messaging strategies were effective at increasing savings deposits. In the 2016 intervention, we sought to separate the effects of choice architecture from those of combining choice architecture with messaging. We found that choice architecture by itself is an effective driver of refund savings deposits and that the additional effects of messaging prompts are fairly minimal. Indeed, these results suggest that certain types of messaging may actually be harmful, as the rate of savings deposits generated by the 2016 interactive prompt was significantly lower than the rate generated by the 2016 passive prompt. This result may have implications for the design of similar interventions: Incorporating interactive elements or elaborate messaging conditions may mitigate the impact of more passive interventions like changes to the choice architecture of a decision environment.

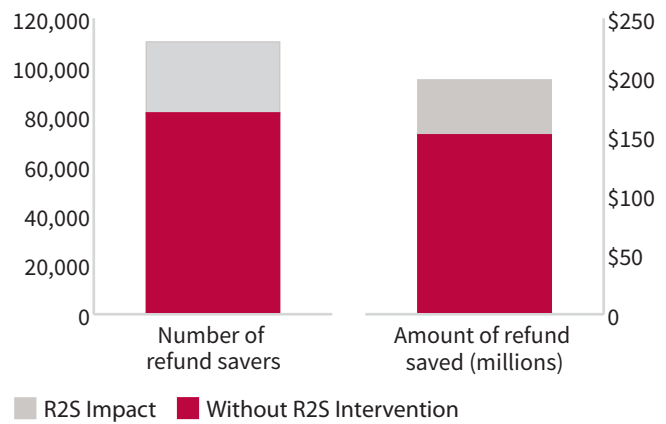


Figure 18. Effects of 2015 and 2016 R2S on numbers of filers depositing and amounts deposited (2015 $N = 646,116$; 2016 $N = 284,125$).

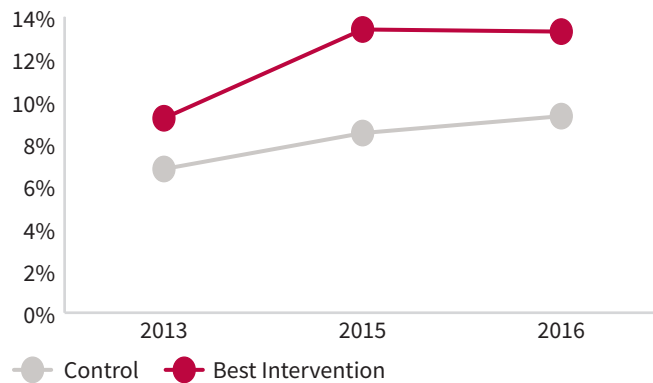


Figure 19. Any of the refund deposited into savings: Control vs. best intervention, 2013, 2015, and 2016.

Both the 2015 and 2016 interventions yielded higher rates of savings deposits than those induced by the 2013 intervention (Figure 19). It is interesting to note, however, that the savings deposit rate of the control group has increased year over year. Over this same period, the personal saving rate in the United States has been roughly stable (U.S. Bureau of Economic Analysis, n.d.). It is possible that returning tax filers (those who use TTFE in multiple years) who are randomly assigned to a treatment group in one year are more likely to deposit their refund into savings if they are assigned to a control group in a subsequent year. Although not conclusive, this pattern may indicate that shifts in behavior during one tax year persist into the future.

Across the 2015 and 2016 intervention years, **R2S generated 29,536 additional savers and an additional \$48 million deposited to savings**

It is possible that returning **tax filers ...** randomly assigned to a treatment group in one year **are more likely to deposit their refund into savings** if they are assigned to a control group **in a subsequent year.**

Part 3

The Impacts of R2S 6 Months After Tax Filing

The analyses reported above have established that low-touch interventions like those employed by R2S can make substantial impacts on savings behavior at tax time. However, those findings do not address whether the effects of the interventions persist over time. The 2013 R2S interventions demonstrated that filers exposed to certain R2S interventions were more likely than counterparts in the control group to have some of their refund saved 6 months after filing (Grinstein-Weiss et al., 2015). Specifically, the likelihood of having some of the refund saved at the 6-month mark was higher among filers exposed to higher suggested savings amounts (30%–31% relative to the 26% savings rate for the control group).

This section of the report extends that analysis by examining the impact of the 2015 interventions on refund savings 6 months after filing. Specifically, this section examines three questions around the 6-month impacts of the R2S interventions:

- ❖ What is the overall impact of the R2S interventions 6 months after tax filing?
- ❖ Are the R2S interventions more effective for households with persistent financial constraints than for other sampled households?
- ❖ How does access to emergency savings moderate the 6-month impact of R2S interventions?

Identifying a Target Population for the R2S 6-Month Analysis

In general, asset building initiatives like IDAs, CDAs, and R2S have been identified as means to help low-income households improve their financial situation (Grinstein-Weiss et al., 2015; Marks, Engelhardt,

Rhodes, & Wallace, 2014; Mills et al., 2016; Sherraden, 1991). A challenge in understanding how those initiatives affect low-income households, however, is that the definition of *low income*—a designation typically based on household earnings—obscures important differences among households. For example, household income could be low due to a temporary circumstance, such as a spell of short-term unemployment or higher education enrollment, and it is likely that households in such situations will have higher earnings in the foreseeable future. Therefore, they are likely different from households experiencing multiyear spells of poverty due, for example, to employment in persistently low-wage occupations or to health issues that prevent full-time employment.

Distinguishing between transitory and long-term poverty is a well-established practice in the literature (e.g., Cellini, McKernan, & Ratcliffe, 2008; McKay, 2009; McKernan & Ratcliffe, 2002). The distinction is borne out by historical estimates of the likelihood of a household leaving poverty. Research using the Panel Study of Income Dynamics has found that the likelihood of exiting poverty over the course of a year is fairly high but drops rapidly as the duration of a poverty spell grows (Bane & Ellwood, 1986; Stevens, 1994).

Through these analyses, we also sought to understand the impact of the interventions on what might be considered the target population for R2S; that is, the population that likely stands to benefit the most from interventions to develop their emergency savings. The specification of a target population is important because the TTFE population, though almost entirely comprised of low-income households (other than a small percentage of higher income active-duty military households), is relatively heterogeneous. In 2015, for example, 14% of filers reported unexpectedly losing a job during the 6 months prior to tax filing,

23% reported experiencing an unexpected reduction in income during that period, and 14% reported being unemployed in that time.¹⁰ Additionally, 34.2% of HFS respondents were students, and it is likely that their savings needs differed considerably from those of the general population. These results suggest that many of the households in the TTFE sample may be transitorily low income—that is, their income may have fallen below the threshold required for access to the free TTFE product, but they were not necessarily chronically low income or they were students whose financial circumstances were likely to shift significantly when they completed their education.

Although efforts to promote the accumulation of assets can have immensely beneficial effects in many LMI households, it is not clear that public policy should focus on savings accumulation in households experiencing temporary spells of poverty or in those with working-age members who are enrolled in school. Households with temporarily low income likely need the tax refund to maintain consumption until changes in circumstances lead to increases in earnings or until education is completed.

This understanding of the nature of poverty and the goals of asset-building programs enabled us to identify the target population for the R2S savings interventions: Households that experience persistent financial constraint but include no enrolled adult student at tax time. We define *persistent financial constraint* as multiple, consecutive years of low earnings. For these analyses, households are deemed to have persistent financial constraints if they are represented in TTFE data for at least two consecutive years (and therefore have income below TTFE's threshold or receive the EITC). The HFS data are used to distinguish households that include adult students from households that do not.

Methods

Sample

The sample used in the 6-month analyses is similar to the sample used in the assessment of the tax-time impacts of the 2015 R2S interventions: Households that have annual AGI below \$31,000, are EITC recipients, or include members on active duty in the U.S. military and have annual AGI below \$60,000. There are two key differences between this sample and that drawn for the tax-time analyses. First, the 6-month analytic sample only includes households that completed both the first and second waves of the HFS. Second, we restrict the analyses to households that had savings accounts at tax time. The reason for this restriction is that the R2S interventions are largely targeted at those who

have savings accounts. The goal of the interventions is to encourage deposits into savings vehicles, so we would not expect households that lack savings accounts to be impacted by the intervention. In total, 75% of households had savings accounts at tax time.

Data

The analyses of the 6-month impacts of the interventions drew almost exclusively upon data from the longitudinal HFS rather than upon administrative tax data provided by Intuit. As noted above (see p. 10 of this report), half of refund-receiving TTFE users were invited to complete HFS1 immediately after filing their taxes; these filers were contacted again 6 months after filing and invited to take part in HFS2.

In total, 14,993 households in the R2S experiment completed HFS1 and 5,518 completed HFS2. After exclusions due to missing data, our full sample included 5,457 tax filers. Of these respondents, 4,443 owned savings accounts and 1,194 of these met the criteria for our target population; that is, they were nonstudents with persistent financial constraints. The outcome variables for these analyses were drawn exclusively from HFS2. The control variables come from HFS1 and the administrative tax data.

Analytical Strategy—6 Month Impacts

The evaluation of the experiment's tax time impacts leveraged the experimental design of R2S to directly compare the treatment and control groups' savings behaviors when they filed their taxes. For the 6-month analyses, we generated regression-adjusted estimates of the 6-month impacts. This approach allowed us to control for any baseline differences between the control and treatment respondents who participated in the HFS2. It also enabled a more precise read on the overall impact of the treatments. For each outcome explored here, the impact is therefore the regression-adjusted difference between 6-month outcomes for the treatment group and those for the control group.

For a subset of the 6-month analyses reported in this section, we examined how access to emergency financial resources interacted with the R2S savings interventions. This allowed us to assess whether R2S has helped build savings among households lacking substantial emergency resources that could help to buffer the effects of financial shocks.

Outcome Variables

Two outcome variables were used in these analyses. The first was an indicator variable capturing whether an HFS2 respondent had *any* of the refund saved 6 months after filing. This variable was coded 1 if the

filer still had some of the refund and 0 otherwise. The other outcome variable was the *proportion* of the refund still saved 6 months after filing. This variable was measured on a scale from 0% to 100%.

Control Variables

Although the outcome variables for these analyses were measured 6 months after participants filed their taxes, the control variables were measured at the time of tax filing. The control variables came from both the administrative tax data and the data collected through HFSI. In analyzing the administrative data from filers' tax forms, we controlled for the AGI and the federal tax-refund amount. In analyzing data from HFSI, we controlled for the following:

- ❖ The reported experience of *any* of seven material hardships in the 6 months prior to filing. The measured hardships stem directly from financial difficulties: self-reported occurrences of skipping rent, skipping any bills, skipping medical or dental care, skipping necessary prescriptions, being unable to afford the necessary type or amount of food, overdrawing a bank account, and having a credit card declined because the respondent's balance exceeded the credit limit. Respondents were asked a series of yes-or-no questions about their experience with these hardships. The answers were coded as 1 if they had experienced any of these hardships and 0 otherwise.
- ❖ The reported experience of *any* of seven financial shocks in the 6 months prior to filing. The shocks included the following: losing a job unexpectedly or having an unexpected reduction in income; having an unexpected home or vehicle repair; having unexpected legal expenses; having expenses due to a natural disaster; having unexpected, major, out-of-pocket medical expenses; being the victim of a crime affecting finances or property; and having a major life change that affected the respondent financially (e.g., a divorce or the birth of a child). Respondents were asked a series of yes-or-no questions about their experience with these shocks, and their responses were coded as 1 if they had experienced any of these shocks and 0 otherwise.
- ❖ Access to \$2,000 in an emergency. Respondents were asked, "How confident are you that you could come up with \$2,000 if an unexpected need arose within the next month?" If these respondents reported that they were "certain" or that they "could probably" come up with the full \$2,000, the

variable was coded as 1. If they reported that they were "certain" or that they "could probably" not come up with the full \$2,000, it was coded as 0.

- ❖ The amount of self-reported credit card debt.
- ❖ Respondents' budgeting behavior. Respondents were asked whether they identified with the following statement: "I budget carefully." If they responded that the statement was "very much like me," "mostly like me," or "somewhat like me," the variable was coded as 1. If they reported that the statement was "not much like me" or "not at all like me," it was coded as 0.

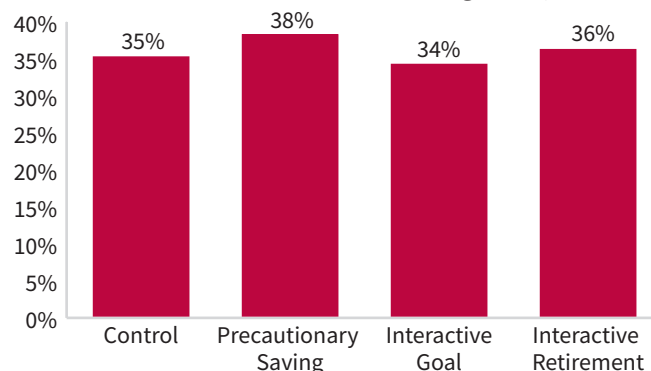
These baseline controls were chosen because they succinctly captured many aspects of filers' financial lives: behaviors, balance sheets, incomes, refund characteristics, the amount of volatility in their lives, and the financial constraints to which they were exposed. Controlling for these key financial indicators ensured that the treatment and control groups were as similar as possible and that estimates of treatment effects are precise. Although randomization should have balanced the groups, the use of control variables also enabled us to account for any imbalance that may have emerged from differential propensities among the groups to select into both waves of the HFS.

The 6-Month Impacts of R2S

What Is the Overall Impact of the R2S Intervention 6 Months After Tax Filing?

Figure 20 presents estimates of the regression-adjusted impact of R2S on the likelihood that tax filers had some of the refund saved after 6 months. In general, among LMI filers who could have deposited to savings at tax time (i.e., they owned savings accounts), there is a directional but nonsignificant relationship between assignment to the Precautionary Saving condition and having some of the refund saved after 6

Figure 20. Percentages of R2S participants who still had some refund saved 6 months after filing (n = 4,443).



months: 37.9% of filers assigned to that condition still had some refund saved, but the same was true for only 35.0% of the control group (an 8% difference; $p = .13$). The other conditions appeared to be less effective at driving saving 6 months after tax filing.

Are the R2S Interventions More Effective for Households With Persistent Financial Constraints?

As we explained above, the target population for R2S interventions consists of households that have persistent financial constraints but no adult members enrolled in school. This is the population typically targeted by asset-building initiatives aimed at decreasing poverty. As Figure 21 illustrates, these households benefitted disproportionately from the R2S interventions. In each treatment condition, the percentage of filers with some of the refund in savings after 6 months was higher than the percentage of control-group filers with savings at that point. The Precautionary Saving condition was the most effective at driving increased savings rates: Filers in this condition were 10 percentage points more likely than counterparts in the control group to have any of the refund saved after 6 months ($p < .01$).

Figure 22 illustrates the regression-adjusted *proportions* of the refunds saved across treatment groups, relative to the control group. Only filers in the Precautionary Saving condition had a significantly higher proportion of the refund in savings after 6 months: On average, filers exposed to this condition

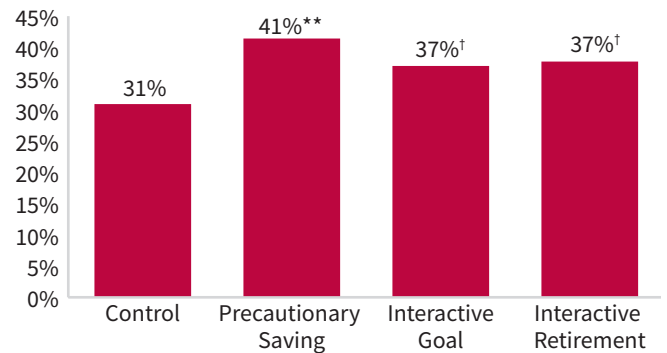


Figure 21. Percentages of R2S participants with persistent financial constraints and some refund saved 6 months after filing ($n = 1,194$).

† $p < .10$; ** $p < .01$ (different from control).

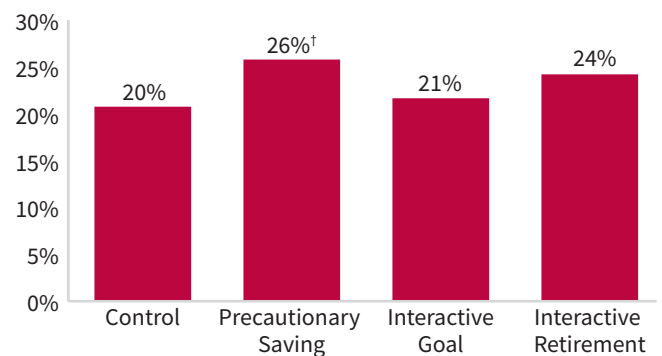


Figure 22. Proportions of refunds saved 6 months after filing among R2S participants with persistent financial constraints ($n = 1,194$).

† $p < .10$ (different from control).

Filers in **the Precautionary Saving condition** had a **significantly higher proportion of the refund in savings** after 6 months: On average, filers exposed to this condition **saved 5% more of their refund** than did counterparts in the control group. Given the average refund of this population (\$2,052), **the increase translates to an additional \$100 in savings 6 months after filing**

though ... messaging at tax time had little impact on tax-time savings deposits, **certain types of messages can help shift filers' savings behaviors** in the period after filing.

saved 5% more of their refund than did counterparts in the control group. Given the average refund of this population (\$2,052), the increase translates to an additional \$100 in savings 6 months after filing.

How Does Access to Emergency Savings Moderate the 6-Month Impact of the R2S Interventions Among Constrained Households?

Having established that the R2S interventions were associated with increased savings 6 months after filing among households with persistent financial constraints, we examined how this impact was moderated by access to a substantial amount of emergency resources. Figure 23 shows the regression-adjusted 6-month R2S results among two groups of households with persistent financial constraints: households reporting that they could access \$2,000 in an emergency at the time of tax filing and those reporting that they could not. The results show that the 6-month benefits of R2S are concentrated among those who were unable to access such resources, and the largest effect was observed among filers in the Precautionary Saving condition. Specifically, filers in the Precautionary Saving condition who could not access \$2,000 in an emergency were almost twice as likely as filers in the control group to have any of the refund saved after 6 months. The finding is compelling because this was the only condition in which the intervention explicitly tied the refund to saving for emergencies. The finding may indicate that, though variation in messaging at tax time had little impact on tax-time savings deposits, certain types of messages can help shift filers' savings behaviors in the period after filing.

Among households with persistent financial constraints and access to \$2,000 in emergencies, the impact of R2S was less pronounced and not statistically significant. This is perhaps unsurprising. The need to build savings with the refund was probably less pressing for those households.

Discussion of the 6-Month Impacts of R2S

The results of the 6-month analyses of the 2015 R2S interventions presented here are mixed but ultimately very encouraging. On average, filers assigned to an R2S treatment group and those assigned to the control group did not differ significantly in the amount of the refund still in savings 6 months after filing, despite the fact that the R2S treatments were associated with large changes in savings depositing behaviors relative to the control. However, there were substantial improvements among filers with persistent financial constraints, and they likely have the most need to build savings. The most effective treatment condition, which combined choice architecture with messaging that emphasized saving the refund for emergencies, led to around a third more filers with persistent financial constraints having some of the refund saved 6 months after filing—a difference of 10 percentage points from the rate among filers in the control group. These results were even stronger for those without access to substantial emergency resources

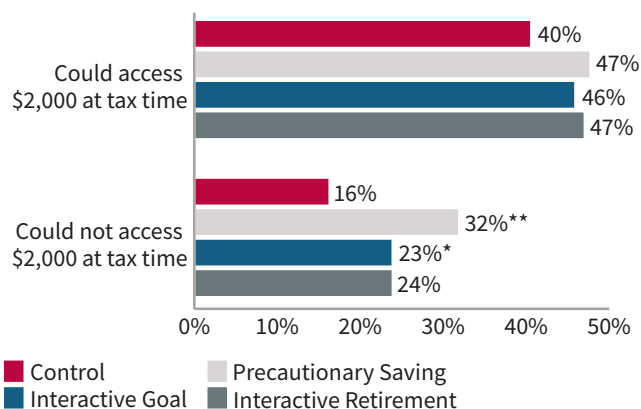


Figure 23. Percentages of households that had persistent financial constraints and any refund saved 6 months after filing. Ability to access \$2,000 in an emergency was reported at tax time ($n = 1,194$).

* $p < .01$ (different from control).

at tax time (defined as being able to access \$2,000 in an emergency); the treatment condition focusing on emergency savings effectively doubled the 6-month refund savings rate among filers with persistent financial constraints.

It is worth noting the relationship between the impacts of these interventions and the relative time involved in the interventions. Compared with filers in the control group, members of the 2015 R2S treatment groups spent 3.6 seconds more on the intervention screens that incorporated one of three messaging conditions and choice architecture emphasizing savings. Despite this small amount of time, the interventions demonstrated large impacts in driving behavior at tax time and led to increased savings for a key population even 6 months after filing.

The impacts of these interventions, both at tax time and 6 months after filing, are somewhat remarkable given that **the interventions add less than 10 seconds to the entire tax-filing process**. This demonstrates that even extremely **low-touch interventions** have the potential to **substantially shift individual behaviors and that these impacts can last over time**.

Conclusion and Policy Implications

This report presents the impacts of the Refund to Savings Initiative in the years of 2015 and 2016. The fundamental idea underlying R2S is that tax time represents an important opportunity to address the low rates of saving observed among LMI households in the United States, and the low rates of emergency saving in particular. The tax refund is the largest amount of money many LMI households receive all year. The tax moment is therefore an opportunity for holistic consideration of household finances and financial goals. Intervention at tax time may help these households build savings—an accomplishment that is perhaps beyond their ability through the rest of the year.

The R2S interventions primarily used two techniques informed by behavioral economics—the use of persuasive message and choice architecture—to encourage LMI filers to deposit their tax refund into a savings vehicle such as a savings account or U.S. savings bond. The results demonstrate that these tax-time interventions were very successful at changing the refund depositing behavior of LMI tax filers. In 2015, the most successful intervention combined choice architecture with messaging around the need to build emergency savings. That intervention resulted in a 58% increase in the rate at which filers deposited their refund into a savings vehicle. Similar results were observed in 2016.

Although more mixed than the findings on the intervention effects at tax time, the findings concerning the interventions' impacts on savings held 6 months after tax filing are still very encouraging. In general, we observed directional increases in the 6-month savings rates of treatment participants relative to the rate among counterparts in the control group, but these effects were not statistically significant. However, in analyzing the

6-month impacts of R2S interventions, we observed pronounced and significant differences among the sampled households that faced persistent financial constraints. These results were even stronger for households that lacked emergency savings and were exposed to messaging around the importance of saving the tax refund for emergencies.

The impacts of these interventions, both at tax time and 6 months after filing, are somewhat remarkable given that the interventions add less than 10 seconds to the entire tax-filing process.¹¹ This demonstrates that even extremely low-touch interventions have the potential to substantially shift individual behaviors and that these impacts can last over time.

The findings presented in this report have a number of implications for policy and practice. First and foremost, the results demonstrate that tax time can serve as a key moment to promote savings in LMI households. Although tax credits like the EITC can enhance the financial security of working tax filers, many LMI households likely need additional support and incentives to build emergency savings or to save for other long-term purposes.

Our findings also offer lessons for the design of similar interventions. The first is that choice architecture is a stronger driver of behavior change than persuasive messaging is. This may be due to the nature of tax filing: The R2S interventions occur near the very end of the tax-filing process, when tax filers may be tired or inattentive from filling out their taxes. As such, interventions that require minimal engagement or that make saving as simple as possible—for example, making saving the entire tax refund the most salient deposit option—may be more effective than interventions that require filers to read and consider different messages.

However, messaging can still have an incremental impact on savings behavior. Another implication from this work is that messaging on emergency savings is somewhat more effective than messaging on general financial goals or on retirement savings. This is unsurprising. Among LMI households, saving for emergencies is likely a more pressing priority than saving for general goals or retirement. Levels of emergency savings are generally low in these households and financial shocks are relatively frequent.

Of course, there is also evidence that messaging—though less effective at changing tax time behaviors—is effective at changing downstream behaviors. Filers who lacked emergency savings at tax time appeared to respond to the emergency messaging they received through the R2S intervention; the percentage of filers with some of the refund still in savings at the 6-month mark was higher among those exposed to the emergency messaging than among filers in other interventions.

Finally, these findings have implications for the measurement of tax-time savings interventions. Many Volunteer Income Tax Assistance sites promote tax refund saving. They often identify tax-refund savers as those who split their refund between a savings account (or U.S. savings bonds) and some other account. However, the R2S Initiative has consistently shown that rates of splitting are very low among LMI tax filers. In 2015, members of the control group split their refunds at a rate of 0.7%, and those in the treatment groups split their refunds at a rate of 0.9%—despite a choice architecture that emphasized splitting the refund into a savings account as the second-most salient deposit option. In 2013, an even greater emphasis was placed on splitting the refund. Despite the use of savings anchors that encouraged filers to save a given percentage of the refund or a specific dollar amount, split rates were relatively low (Grinstein-Weiss et al., 2015). These findings clearly suggest that LMI tax filers have an overwhelming bias in favor of depositing the refund into a single account. Practitioners should therefore consider orienting their savings programs to emphasize depositing the entire refund into savings.

The R2S Initiative demonstrates that small changes to tax filers' decision-making environment can have substantial impacts on savings behavior. Future R2S experiments will continue to explore the use of behavioral economics tools in order to optimize tax-time financial-security interventions. The R2S Initiative will also continue to study the persistence of the effects of tax-time interventions on LMI households' financial behavior and well-being.

Appendixes

Appendix A

2015 R2S Intervention: Precautionary Savings and Interactive Retirement Conditions

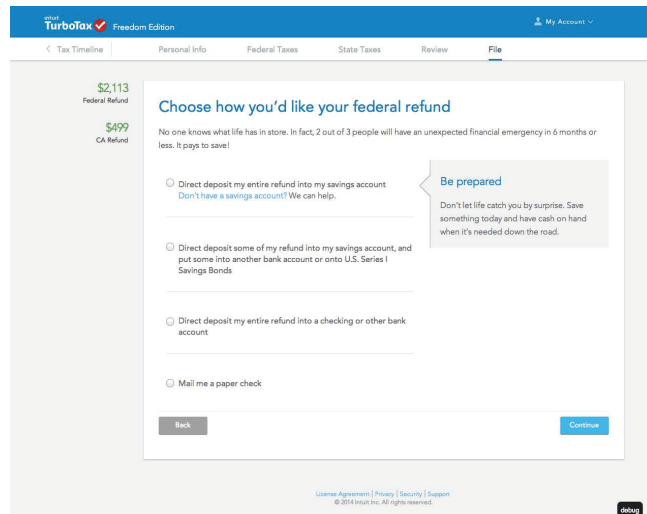


Figure A1. The deposit screen shown to the Precautionary Saving intervention group.

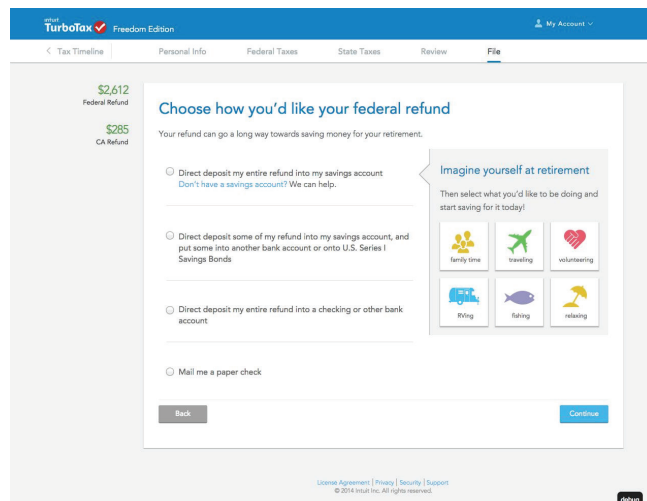


Figure A1. The deposit screen shown to the Interactive Retirement intervention group.

Appendix B

Participant Characteristics: 2015 and 2016 R2S Intervention Groups

Table B1. Participant Characteristics by 2015 R2S Intervention Group

Characteristic	Control	Precautionary Saving	Interactive Goal	Interactive Retirement
Demographics				
Age (mean, in years)	35.28 (15.48)	35.25 (15.44)	35.18 (15.46)	35.27 (15.50)
Filing status (%)				
Single	66.8	66.8	66.9	66.8
Head of household	22.9	22.9	22.7	22.9
Married, filing jointly	9.3	9.3	9.4	9.3
% with any dependents	31.4	31.4	31.3	31.4
No. of dependents (mean)	0.54 (0.94)	0.53 (0.93)	0.54 (0.94)	0.54 (0.94)
Adjusted gross income (\$)	14,862 (9,902)	14,847 (9,893)	14,809 (9,904)	14,864 (9,887)
Tax-related characteristics				
Federal tax refund (\$)	2,035 (2,373)	2,026 (2,382)	2,025 (2,388)	2,033 (2,373)
Federal tax liability (\$)	426 (711)	428 (710)	423 (706)	427 (711)
Amount withheld (\$)	1,105 (1,147)	1,104 (1,182)	1,102 (1,175)	1,108 (1,141)
% receiving EITC	42.0	42.0	41.8	41.8
EITC amount (\$)	2,290 (1,875)	2,279 (1,872)	2,283 (1,873)	2,295 (1,877)
Observations	161,952	161,011	161,936	161,217

Note. R2S = Refund to Savings Initiative; EITC = Earned Income Tax Credit. No significant differences across intervention groups. Standard deviations shown in parentheses.

Table B1. Participant Characteristics by 2016 R2S Intervention Group

Characteristic	Control	CA Only	CA + Emer. Message	CA + Interactive Emer. Prompt
Demographics				
Age (mean, in years)	35.23 (16.17)	35.22 (16.1)	35.15 (16.17)	35.27* (16.24)
Filing status (%)				
Single	68.5	68.8	68.6	68.5
Head of household	22.3	22.1	22.1	22.1
Married, filing jointly	8.3	8.2	8.5	8.5*
% with any dependents	29.6	29.3	29.5	29.4
No. of dependents (mean)	0.50 (0.91)	0.50 (0.91)	0.50 (0.9)	0.50 (0.91)
Adjusted gross income (\$)	14,433 (9,922)	14,344 (9,877)	14,432 (9,915)	14,428 (9,848)
Tax-related characteristics				
Federal tax refund (\$)	1,959 (2,377)	1,952 (2,377)	1,956 (2,375)	1,952 (2,373)
Federal tax liability (\$)	426 (708)	420 (707)	424 (710)	422 (702)
Amount withheld (\$)	1,079 (1,144)	1,077 (1,142)	1,080 (1,134)	1,077 (1,133)
% receiving EITC	39.6	39.6	39.6	39.7
EITC amount (\$)	2,375 (1,923)	2,347* (1,920)	2,362 (1,925)	2,344* (1,923)
Observations	70,978	70,928	71,306	70,913

Note. R2S = Refund to Savings Initiative; CA = choice architecture; Emer. = emergency; EITC = Earned Income Tax Credit. Standard deviations shown in parentheses.

* $p < .10$, different from other groups

Notes

1. TurboTax Freedom Edition is freely available to certain filers as part of the Internal Revenue Service's Free File Program. For more information, see <https://www.irs.gov/uac/about-the-free-file-program>.
2. As used in this report and in other work by the R2S Initiative, the term *splitting* refers to the act of depositing a refund into more than one account—for example, into a checking account and a savings account.
3. As detailed elsewhere in this report, the R2S Initiative collects data through the Household Financial Survey (HFS). The first wave of this longitudinal survey (HFS1) is conducted with filers immediately after they file their taxes, and the second is conducted 6 months later (HFS2).
4. All screenshots of TurboTax Freedom Edition are considered proprietary. Copyright is held by Intuit, Inc.
5. The 2016 R2S experiment also included a component devoted to the *myRA* savings program. The R2S team partnered with the U.S. Department of the Treasury to study the retirement needs of LMI tax filers, to test different messaging strategies, and to experiment with interventions that used behavioral economics to promote *myRA* sign-up at tax time. The sample sizes reported for the regular 2016 R2S interventions reflect the fact that the total participant pool was divided into seven groups: a control group, three savings intervention groups, and three *myRA* intervention groups. The results of the 2016 *myRA* experiment are reported elsewhere.
6. These numbers represent a subset of TTFE filers who received a tax refund. A subset of TTFE participants were not randomly assigned to either a treatment or control condition, typically because they started the tax filing process in a different TurboTax product before switching to TTFE. Filers that did this were not part of the R2S experiment. In total, 206,122 TTFE filers who received a tax refund were not assigned to an experimental condition in 2015 and 254,514 were not assigned to an experimental condition in 2016.
7. Because some TTFE tax filers were not assigned to an experimental condition (see Note 2), these numbers represent a subset of the total respondents to the HFS. In total, 5,101 HFS1 respondents were not randomly assigned to an experimental condition in 2015 and 9,451 HFS1 respondents were not randomly assigned to an experimental condition in 2016.
8. See Appendix B for an examination of participant characteristics across different treatment conditions.
9. Although the analysis of the average treatment impacts of R2S is straightforward due to the random assignment into different experimental conditions, the decision to interact with the messaging prompt in identifying savings goals is not a random one, and this makes it challenging to establish the impact of the interactive messaging prompt on R2S participants. To account for potential differences between filers who interact with the prompts and those who do not, we employed a two-stage least squares model to estimate the likelihood of a filer interacting with the prompts as a function of both the assignment to a particular experimental condition and an array of control variables. We used the estimates from the first stage, which accounted for the differences in filers' propensities to interact with the prompts, to provide an unbiased estimate of the impact that interacting with the prompts had on tax-time savings behaviors.
10. These percentages do not include students, retirees, or homemakers.
11. This does not count any additional time required to input a new account number. If repeat TTFE filers had deposited to checking in a prior year, their account information may have been saved for use in subsequent years. In this case, had they opted for a checking account deposit, that field would have been prepopulated with their account number. Encouraging them into a savings account deposit would then require additional time to fill in the new account information.

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