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ARTICLE

Promoting public retirement savings accounts during tax filing: evidence from field experiments

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Abstract
In 2015, the U.S. Treasury Department launched *my*RA, a no-fee retirement account designed for people who lacked employer-sponsored retirement options. We report findings from two behavioral field experiments intended to motivate interest in using the tax refund to open and fund *my*RAs directly through the tax-filing process. These experiments, administered to more than 100,000 low-income tax filers in 2016, embedded persuasive messages in emails sent to filers and directly within online tax-filing software. We find that interest in *my*RA was generally very low, although interest and enrollment intentions varied depending on the framing of the program's benefits.

Key words: Retirement savings; behavioral economics; tax refund; low-income; field experiment

JEL Codes: D14; D15; I30

This paper presents findings from two experiments testing the effects of different messaging strategies on low- and moderate-income (LMI) tax filers' interest in using their tax refund to open and fund a *my*RA retirement account. The *my*RA was developed by the U.S. government to provide households without access to employer-sponsored retirement savings accounts an option for building retirement savings. Setting money aside for retirement has proven a difficult challenge for many households in general, but particularly for LMI households. According to a 2018 Federal Reserve report, 26% of non-retirees had no savings for retirement held in defined contribution plans (e.g., 401(k) and 403(b) plans), defined benefit plans, or other savings vehicles such as individually managed retirement savings accounts (IRAs; Board of Governors of the Federal Reserve System, 2018). Other researchers have reported a zero median retirement account balance across all U.S. working-age adults and a balance of approximately $40,000 conditional on holding any savings in retirement accounts (Brown *et al.*, 2018). For many LMI households, the difficulty in setting aside money for retirement is compounded by the lack of access to retirement accounts. Indeed, 59% of working-age adults said they did not have a defined contribution plan, defined benefit plan, or IRA (Brown *et al.*, 2018), and 42% of U.S. workers generally (and 67% of part-time workers) lacked access to a retirement plan through their employer (Pew Charitable Trusts, 2016).

The levels of retirement savings are particularly anemic in LMI households (Board of Governors of the Federal Reserve System, 2017; Brown *et al.*, 2018). Perhaps the most straightforward explanation of why these households struggle to save for retirement is inadequate income. LMI household budgets are often entirely consumed by spending on necessities (Schanzenbach *et al.*, 2016), making it difficult to set aside long-term savings without risking material hardships in the short term. In addition, many LMI households struggle to save for retirement because of the complexity of the retirement system

in the United States. Financial literacy is generally low in the U.S. population (Lusardi and Mitchell, 2011) and is especially low among adults who are approaching retirement (Lusardi *et al.*, 2014). For people with lower levels of financial literacy, the relative difficulty of navigating and understanding defined contribution plans can create barriers to participation. LMI households also struggle to build retirement savings because of institutional factors such as a lack of access to employer-sponsored retirement savings plans. As compared with 75% of high-income earners who reported having access to retirement plans through their employer, only 32% of workers with annual incomes of $25,000 or less reported having access to retirement plans through their employer (Pew Charitable Trusts, 2016). An even greater difference exists between upper-income workers and LMI workers regarding actual participation in employer-based retirement plans. Although 72% of upper-income workers participated in a retirement plan, that percentage shrunk to only 20% of LMI workers (Pew Charitable Trusts, 2016).

Policymakers have long been interested in promoting retirement savings in the general population, often using tax incentives for households who save for retirement. In 2015, the U.S. Department of the Treasury implemented the federal *my*RA program – a publicly sponsored, national retirement savings account intended to address both the deficit in retirement savings and the lack of access to retirement plans. The *my*RA account did not charge fees for account opening, maintenance, or fund withdrawals; allowed easy transfers into the accounts, guaranteed relatively risk-free investments (albeit at low interest rates); and had no requirements for minimum contributions or account balances – all of which made it a potentially attractive individual retirement account for LMI households. Shortly after the launch of the *my*RA program, the Treasury department partnered with researchers to test different approaches designed drive enrollment in and deposits to *my*RA accounts for LMI households.

This paper presents the results of two related field experiments conducted through the partnership with the U.S. Department of Treasury in 2015 and 2016. These experiments tested the extent to which messaging interventions delivered before and during the tax-filing process were effective at motivating LMI tax filers to open and fund a new retirement savings account (my*RA*) during their tax-filing process. Both experiments were administered to tax filers using TurboTax Freedom Edition (TTFE), a free online tax-filing program for LMI households. The experiments consisted of two intervention components: (1) a pre-tax season intervention in which previous TTFE filers received one of three randomly selected e-mails with information on *my*RA, and (2) an intervention embedded in the TTFE filing process that showed one of three different *my*RA-related screens during tax filing and invited tax filers to deposit their tax refunds into a *my*RA. The messages shown to tax filers in each of the experiments highlighted different features of the *my*RA accounts meant to address typical barriers to retirement savings in LMI households. In total, 130,280 LMI tax filers took part in the e-mail experiment and 210,397 participated in the tax-filing experiment.

The experiments showed LMI tax filers had an extremely low level of interest in opening a *my*RA during the tax-filing process. Across the two intervention conditions, only between 0.3% and 1.4% of tax filers expressed interest in opening a *my*RA. At the same time, we also found certain message framings were more effective than others at influencing tax filers' interest in the retirement accounts. In particular, in both components (i.e., e-mails and messages embedded in the tax-filing environment) the most effective messages were those highlighting the opportunity to receive larger refunds in the future by depositing to a *my*RA. These messaging strategies were significantly more effective at both driving LMI tax filers to seek more information on *my*RAs and to indicate they wanted to use their tax refund to open and fund a *my*RA account. However, despite the efficacy of these messages, the overall proportion of tax filers who selected options to learn more about *my*RA or to deposit to a *my*RA was extremely low regardless of intervention condition. This low rate of response provides strong evidence that LMI tax filers found opening a *my*RA during tax filing an unappealing offer. Furthermore, although messaging about receiving a larger refund was associated with higher rates of seeking more information on *my*RA, we observed that among those who sought more information the larger refund messaging was significantly less effective at driving interest in depositing to *my*RAs. This is potentially due to the fact that the possibility of receiving a larger refund through *my*RA deposits was tied to the tax filer also accessing the Saver's Credit, which has confusing eligibility criteria and

has not been effective at incentivizing savings for LMI households (Duflo *et al.*, 2007). Additionally, some evidence suggests the *my*RA product and our interventions were more salient for key subsamples, including older households and households in our LMI population with incomes on the higher end of the income range.

Although *my*RA was discontinued in 2017 because of low take-up rates, the findings from our experiments have broad implications for the design and implementation of public savings products aimed at LMI households. For example, although we found LMI households showed little interest in opening *my*RAs while filing their taxes, the near universality of tax filing in the United States presents a promising opportunity to promote retirement savings products.

1. Related literature and study background

This study draws primarily on two related bodies of research. The first is the extensive research on behavioral economics interventions used to promote retirement savings. The second is the more limited research on savings interventions targeted to the tax refund. In this section, we highlight the relevant literature from these fields and provide details on the *my*RA program.

1.1 Behavioral economics interventions promoting retirement savings

Much of the experimental research on promoting retirement savings draws from the field of behavioral economics. This body of research has shown barriers to individuals saving for retirement include numerous systematic and often predictable behavioral factors, including present-biased preferences (Laibson, 1997; Goda *et al.*, 2015), a lack of self-control (Thaler and Shefrin, 1981), or tendencies to procrastinate (O'Donoghue and Rabin, 2001) and stick to the status quo (Samuelson and Zeckhauser, 1988). To counteract or capitalize on these biases, researchers have developed an array of tools and techniques to help individuals increase their retirement savings. For example, one of the most prominent approaches to overcoming workers' procrastination and reliance on the status quo is to automatically enroll employees in a pre-specified employer-sponsored retirement plan unless the worker elects to actively opt out of the plan. In comparison with employer-sponsored retirement plans that require employees to opt-in to the plan, automatic enrollment plans with an opt-out enrollment structure have been highly effective at increasing plan participation (Madrian and Shea, 2001; Choi *et al.*, 2002, 2004). Other strategies, including requiring newly hired employees to make an active retirement plan selection before a pre-specified date and allowing employees to allocate their future pay increases to their retirement accounts have also been very effective at promoting retirement savings (Thaler and Benartzi, 2004; Benartzi and Thaler, 2007; Carroll *et al.*, 2009).

Another class of behavioral interventions focuses on using different framings of messages to influence retirement savings behaviors. Message framing interventions explore the relationship between the way information is conveyed and the choices individuals make in response to that information (Thaler and Sunstein, 2008). For example, because individuals tend to be more responsive to losses than to equivalent gains, framing identical decisions in terms of losses or gains can change individual behavior (Kahneman and Tversky, 1979). In the context of retirement savings, this means that stressing the benefits of making retirement contributions rather than the costs of not saving for retirement might have differential impacts on individuals' decisions and actions. Evidence suggests the intervention strategies most likely to motivate individuals to improve their long-term savings behaviors include those illustrating the implications of exponential growth through compound interest (McKenzie and Liersch, 2011; Goda *et al.*, 2015), emphasizing the social norms of retirement savings (Blanco and Rodrigues, 2020), orienting individuals toward their future (Hershfield *et al.*, 2011), or future well-being of their family (Shah *et al.*, 2019), or personalizing projections and information about future retirement payouts (Fuentes *et al.*, 2017; Dolls *et al.*, 2018; Smyrnis *et al.*, 2019). In the study most relevant to our research, Clark and colleagues (2019) tested whether various messaging strategies in informational flyers distributed to North Carolina public employees would increase retirement savings

contributions. The messages included either general information about the retirement plan or one of four targeted messages that stressed tax advantages, longer life expectancy, possibility for early withdrawal of funds, or personalized investment allocations. These interventions led to statistically significant increases in savings contributions among workers with supplemental retirement savings plans; however, no effects were observed among workers without these supplemental plans.

For the most part, existing experimental studies have not explicitly focused on the retirement savings of lower-income individuals, even though the barriers to saving for retirement can be disproportionately high for LMI households as compared with the rest of the population. Specifically, lower-income households are likely to face severe budget and liquidity constraints that preclude them from investing in retirement accounts (Board of Governors of the Federal Reserve System, 2016, 2018), experience greater institutional barriers to savings (Beverly and Sherraden, 1999), have less access to employer-sponsored retirement programs (Pew Charitable Trusts, 2016), and have lower levels of financial literacy, which can make it more difficult to optimally allocate savings for retirement (Lusardi and Mitchell, 2011). The presence of persistently low and often volatile incomes can also amplify behavioral and cognitive biases in financial decision making (Shah *et al.*, 2012), meaning that LMI households might be more at-risk of saving too little for long-term considerations such as retirement.

An exception to the lack of experimental interventions promoting retirement savings in LMI populations comes from the only other *my*RA-related intervention in the literature, outside the current study. Researchers partnered with two community organizations to use a combination of financial education and behavioral interventions, including having participants visualize their future needs and commit to opening a *my*RA by a certain future date (Blanco *et al.*, 2020). The intervention took around 50 min to deliver and increased the rate of opening a *my*RA from 0% in the control group to 14% in the treatment group, indicating a relatively high-touch approach can generate notable increases in retirement program enrollment among LMI clients of a community-based organization.

1.2 Tax filing and savings behavior in LMI households

The tax-filing process presents a timely opportunity to promote retirement savings, especially for LMI households. First, tax filing is an almost universal experience in the United States, and the majority of filers receive tax refunds (Internal Revenue Service [IRS], 2019). Thus, interventions conducted through the tax system and centered on the tax refund have the advantage of potentially reaching a majority of households on a yearly basis. Second, for many LMI households the federal tax refund comprises the largest single sum of money they receive in a year (Roll *et al.*, 2018). Accordingly, many LMI households report relying on tax refunds to engage in financial behaviors that are less feasible throughout the year, such as paying down their debt obligations and building their short- and long-term savings (Mendenhall *et al.*, 2012; Sykes *et al.*, 2015; Grinstein-Weiss *et al.*, 2017*a*; Jones and Michelmore, 2018). Finally, considering that lower-income individuals often lack access to institutional mechanisms to facilitate asset accumulation (Beverly and Sherraden, 1999), the increasing prevalence of electronic tax filing and receiving tax refunds via direct deposit (IRS, 2019) can help remove some of the existing barriers to saving.

A growing body of research has examined whether LMI tax filers can be motivated to allocate part or all of their tax refunds toward short- and long-term savings during the tax-preparation process. Broadly, these studies can be divided into three groups. The first group tests whether providing financial incentives to LMI tax filers can drive their savings behaviors. Field experiments by Duflo *et al.* (2006) and Saez (2009) found that, as compared with the control group (i.e., did not receive incentives), providing LMI households with matched incentives for contributions into IRAs during the tax-filing process increased take-up rates and the amount of IRA contributions. Others have explored whether offering 50% matches on saved tax refunds would persuade LMI filers to hold their deposits in savings accounts for 1 year. Their findings indicated that, as compared with households that did not

receive a match, households offered the match were not only more likely to save, but also more likely to accumulate greater savings (Azurdia *et al.*, 2014; Grinstein-Weiss *et al.*, 2015). In contrast, interventions that provided financial incentives through a non-refundable tax credit on IRA contributions yielded substantially smaller changes in savings outcomes (Duflo *et al.*, 2007).

The second group of studies examined how incorporating techniques drawn from behavioral economics into the tax-filing process can affect the savings behaviors of LMI tax filers. The proliferation of electronic tax-filing platforms provides a useful setting for testing the impact of low-cost, low-touch interventions implemented directly in the tax-filing environment. For example, Roll *et al.* (2019) and Grinstein-Weiss *et al.* (2017*b*) tested how behaviorally informed interventions embedded in tax-filing software influenced the propensity of LMI households to save their tax refund. In Roll *et al.* (2019), tax filers in the intervention group saw a screen with a salient refund deposit option and were also exposed to motivational messages (emphasizing the importance of saving for emergencies, family, or future) and suggested savings amounts (i.e., anchors). In Grinstein-Weiss *et al.* (2017*b*), individuals in the treatment group were shown refund deposit options that emphasized savings account deposits combined with one of several different savings prompts (e.g., emphasizing saving for emergencies, retirement, or specific goals). These studies found that, as compared with the control groups that saw generic refund deposit screen, the interventions had consistently positive effects on savings behaviors of LMI tax filers. Although the interventions had modest effects, these tax-time interventions reached hundreds of thousands of LMI tax filers and generated substantial aggregate savings.

The third group of studies investigated how providing different types of information during the tax-filing process can affect savings behaviors. For example, presenting an offer of savings incentives in terms of savings matches rather than credit rebates improved tax filers' savings rates (Saez, 2009), and providing information about the U.S. Savings Bonds at tax time increased the use of the tax refund to purchase of bonds (Tufano, 2011). Besides savings behaviors, presenting relevant and well-structured information has been shown to influence tax filers' behaviors. In one study, researchers partnered with the IRS to increase the take-up of the earned income tax credit (EITC). Potential EITC recipients were sent letters with different content about the credit. Although sending any letter at all was associated with increased EITC take-up rates, the content of the letter mattered. Letters that emphasized the maximum payout of the EITC were the most effective at driving take-up of the credit, whereas letters that provided large amounts of information about the EITC were less effective than generic reminder letters (Bhargava and Manoli, 2015).

1.3 Present study

Our study differs from other tax-time savings interventions in three important ways. First, although previous tax-time savings studies mainly focused either on incentivizing general-purpose, short-term savings (e.g., Roll *et al.*, 2020) or retirement contributions into IRAs (e.g., Duflo *et al.*, 2006), this study focused on a new retirement-savings product targeted to lower-income households. Notably, lower-income tax filers might be relatively insensitive to tax-time savings interventions given their greater financial constraints and because many plan in advance how they intend to use their tax refunds (Bronchetti *et al.*, 2013; Roll *et al.*, 2020). Promoting an entirely new savings program such as *my*RA requires overcoming these existing obstacles to savings, mitigating potential issues associated with the accumulation of long-term savings, and addressing the lack of knowledge and misperceptions about a new account. Second, unlike other similar informational interventions conducted in-person at tax preparation sites, this large-scale field experiment used a combination of two electronic means – e-mails and electronic tax-filing software – to both deliver information about the retirement savings program and to have tax filers indicate interest in opening an account during the tax-filing process. Finally, this study is the first to examine the extent to which behavioral interventions can promote interest in opening a retirement savings account during the tax-filing process.

1.4 myRA program background

The federal government launched the *my*RA program nationwide in November 2015, as a 'simple, safe, and affordable' starter retirement account (U.S. Department of the Treasury, 2015). The *my*RA account was targeted to individuals who lacked access to employer-sponsored retirement plans (or other retirement savings options) and those who made only small contributions to their retirement plans (U.S. Department of the Treasury, 2015). The *my*RA plan was a Roth-style savings account that had no requirements for minimum balances or contributions and followed the same eligibility requirements as a Roth IRA. The *my*RA program had no fees associated with account opening, maintenance, or withdrawals, and the program enabled participants to easily make contributions or withdrawals. The absence of withdrawal fees might have been especially appealing to LMI individuals because this feature reduces the risk of facing material hardship due to over-saving for retirement in the short term. That is, if *my*RA account holders faced a financial emergency, they could withdraw funds tax-free from their retirement savings without paying penalties or fees. Additionally, the *my*RA program offered mechanisms to encourage regular deposits. For example, account holders could set up automatic payroll deductions, direct deposits to their *my*RA accounts through their bank accounts, and deposit part or all of their federal tax refunds into *my*RA accounts at the time of tax filing. After-tax contributions into *my*RA accounts were backed by U.S. government bonds with interest tied to the Government Securities Fund, thereby guaranteeing nearly risk-free investments albeit with low annual returns (e.g., 2.04% per year in 2015; Federal Reserve Bank of Dallas, 2017). The *my*RA accounts had age-based limits on annual contribution amounts: account holders younger than 50 years could contribute up to $5,500 annually, whereas those older than 50 could contribute up to $6,500, with a total balance limit of $15,000 for all account holders. Balances beyond the $15,000 limit would be transferred to a privately managed Roth IRA plan.

By July 2017, approximately 30,000 *my*RA accounts had been opened, but only 20,000 had been funded by deposits, with a median balance of $500 (Bernard, 2017). The Treasury discontinued the *my*RA program in 2017, citing low program enrollment and relatively high program maintenance costs. Existing *my*RA account balances were transferred into a Roth IRA. However, the field experiment in this study ended in April 2016, which was more than a year before the *my*RA program was discontinued.

2. Study design and analysis

2.1 Experimental procedure

This study used administrative tax data from a field experiment conducted during the 2016 tax season as part of the Refund to Savings (R2S) initiative, which is a collaboration between Washington University in St. Louis and Intuit Inc., the makers of TurboTax. The purpose of this experiment was to test how behaviorally informed interventions conducted at the time of tax filing (roughly 1 to 4 months after the launch of *my*RA) could promote a retirement savings program (i.e., *my*RA) to LMI tax filers and encourage them to deposit their tax refunds into *my*RA accounts. Only households using the TTFE online tax-filing platform could participate in the study. To be eligible to file taxes with TTFE in 2016,[1] households had to earn $31,000 or less in adjusted gross income (AGI) in the previous year, qualify for the EITC, or be active duty military members with AGI of $60,000 or less. During the 2016 tax-filing season, 93% of TTFE tax filers had AGI of $31,000 or less and 40.5% claimed the EITC.

This study examines two related field experiments. The first experiment involved sending one of three versions of e-mails with information about *my*RA to the prior year's TTFE filers; the tax filers received the e-mails 30 days before the start of the tax season. The second experiment was embedded within the TTFE filing platform and invited tax filers to deposit their tax refunds into *my*RA

[1]TTFE software is offered to LMI households as part of the IRS Free File Alliance (https://freefilealliance.org/).

retirement accounts during the tax-filing process. In both experiments, randomization occurred at the individual level. As Tables A1 and A2 in the Appendix show, the treatment groups in both experiments were highly similar on observable characteristics, suggesting that the randomization worked as intended. These interventions were conducted shortly after *my*RA launched nationwide in November 2015; the e-mail interventions were delivered in December 2015, and the TTFE interventions were delivered during the 2016 tax season.

2.1.1 Experiment 1 – pre-tax season e-mails

For the first experiment, Intuit sent out informational e-mails to all previous-year TTFE filers to promote opening *my*RA accounts during the 2016 tax season. These emails were sent at the end of December 2015. Table 1 summarizes intervention conditions for pre-tax season e-mails, and the e-mails are presented in Appendix B. Previous-year TTFE filers received one of three e-mails selected at random. Each of the three e-mail messages had distinct information about the *my*RA program. The 'starter account' e-mail suggested that tax refunds could be used to start saving for retirement and showed projected future savings. The 'simplicity' e-mail underscored that *my*RA accounts were simple, safe, and affordable. The 'bigger refund' e-mail emphasized that opening a *my*RA account could lower tax liabilities and increase tax refunds by allowing tax filers to qualify for the Saver's Tax Credit, which is a non-refundable tax credit available to LMI households that make deposits to qualified retirement accounts such as *my*RA. The e-mail subject line did not differ across intervention conditions.[2] After opening the e-mail, recipients could click on a 'Sign up today' button that redirected them to the www.myRA.gov website.

2.1.2 Experiment 2 – messages embedded in a tax-filing product

The second experiment was conducted during the 2016 tax season and consisted of creating different messaging to promote opening a *my*RA account during the TTFE tax-filing process. During the tax-filing process, all participants (i.e., tax filers) who received federal tax refunds were shown one of three informational screens highlighting a feature or benefit of *my*RA accounts (i.e., convenience, simplicity, or bigger refund). After tax filers had learned the amount of their tax refund, they were shown one of the screens (selected at random), and in the next step of the process had to decide how to receive their refunds. Table 1 outlines each intervention condition within the TTFE tax environment, and the message screens are depicted in Appendix C. The 'convenience' screen stated that *my*RA accounts were quick to open, easy to manage, and incurred no fees. The 'simplicity' screen described *my*RA accounts as simple to use, affordable, and secure. The 'bigger refund' screen emphasized that saving for retirement by opening a *my*RA during the current tax-filing session could yield a larger tax refund the following year through the Saver's Tax Credit. All intervention conditions contained a 'learn more' button that, if clicked on, redirected tax filers to a screen with more information on *my*RA.

After tax filers were shown the pre-deposit screens, they were taken to the refund deposit screen (see Appendix D). The three invention conditions all used identical refund deposit screens. This screen listed five options for depositing a tax refund, with the options listed in the following order: (1) deposit some or all of the refund into a *my*RA retirement account, (2) deposit the entire refund into a savings account, (3) split the refund between a savings account and another bank account or U.S. Savings Bonds, (4) deposit the entire refund into a bank account, or (5) get a refund through a mailed paper check. The first option appeared alongside the *my*RA logo. Tax filers could select any of five methods to deposit the tax refund. However, because federal regulations prohibit account opening during the tax-filing process, those who chose to deposit their refund into a *my*RA savings account were redirected to a separate pop-up screen that invited tax filers to open a *my*RA account through the www.myRA.gov website and subsequently routed them back to the refund deposit screen. After selecting a method for depositing their tax refunds, TTFE users could then submit their tax returns. Given the inability to open *my*RA accounts during the tax preparation process,[3] these

[2]The e-mail subject line read: 'Turn your 2015 tax refund into savings with *my*RA'.

[3]Tax filers with an existing *my*RA account could deposit their refund during the tax-filing process.

Table 1. Experiments and intervention conditions

Condition	Key message	Message framing
Experiment 1: Pre-tax season e-mails		
'Starter account'	No fees; no complications; no risk	'Use your tax refund to start saving for retirement' 'Even a portion of your refund can generate real savings'. • 'No cost to open and no fees'. • 'No complicated investment options'. • 'No risk of losing money'.
'Simplicity'	Simplicity; affordability; security	'*my*RA makes saving for retirement simple, safe, and FREE of fees'. '*my*RA is a good option to start saving'. • 'It's simple. You take control'. • 'It's safe. No need to worry about your investment'. • 'It's affordable. Budget friendly – no costs or fees'.
'Bigger refund'	Less taxes; bigger refund	'You could pay less in taxes this year – open a *my*RA account and save'. 'Contribute to *my*RA before April 18, 2016'. • 'You could pay less in taxes by opening a *my*RA account'. • 'You could get a bigger tax refund with the Saver's Tax Credit'.
Experiment 2: In-product messages at tax time		
'Convenience'	Speed; easiness; no hassle/ no fees	'Saving for retirement can seem impossible' *my*RA is… • 'Quick to open'. • 'Easy to manage and track'. 'No hassles, no fees'.
'Simplicity'	Simplicity; affordability; security	'Saving for retirement doesn't always seem easy.' *my*RA is… • 'Simple to use'. • 'Affordable'. • 'Safe and secure'.
'Bigger refund'	Bigger refund next year	'Like an even bigger refund next year?' 'Get up to $1,000 added to your refund next year by setting money aside for retirement'.

experiments examine only the LMI households' interest and readiness to invest in *my*RA. Given this barrier, our ability to draw conclusions about whether tax filers would follow through with opening an account (and how much they would deposit to the account upon opening) is limited.

Each of the message framings in both experiments were chosen to address different barriers LMI households might face when deciding to open and make deposits in a retirement savings account. The Treasury had branded *my*RA as a 'starter retirement account to help bridge the savings gap for many [workers who lack employer-sponsored retirement account]' (U.S. Department of the Treasury, 2015). Accordingly, the 'starter account' messaging was designed to target filers who might feel overwhelmed by the many complex retirement savings options available to them. This message focused explicitly on the ease of starting a *my*RA account, particularly through the use of the tax refund to fund the account. We believed this approach had potential to overcome behavioral inertia by minimizing the perceived effort in opening an account. The 'simplicity' message was designed to address potential perceptions of the complexity of managing a retirement account because such perceptions can act as a major barrier to retirement savings (Lusardi and Mitchell, 2011). Similarly, some evidence has suggested that consumers' perceptions of inconvenience act as a barrier and reduce take-up of public programs (Ebenstein and Stange, 2010). Thus, the 'convenience' message framed the benefits of *my*RA in terms of the speed and ease of account opening and management, with the aim of offsetting potential

concerns related to time costs of managing the account. Yet, another barrier to retirement savings is a lack of liquidity. Evidence from other public programs has shown that messaging around the maximum dollar value of the program (e.g., the EITC) was effective at increasing the take-up of those programs (Bhargava and Manoli, 2015). Thus, the 'bigger refund' message was intended to address thinking that saving for retirement would put a strain on already-tight budgets. The message emphasized that by saving now for retirement, households may be able to enjoy additional income (through reduced tax burden) in the future.

2.2 Research questions and study expectations

This study was guided by the following research questions:

1. What is the level of interest among LMI tax filers in opening public retirement accounts during the tax season?
2. How does the message content about retirement savings relate to LMI tax filers' propensity to open a public retirement account?
3. How does the mode of message delivery with content on retirement savings (e.g., e-mails, messages delivered during tax filing, or a combination of both) relate to LMI tax filers' propensity to open a retirement account?
4. How do the effects of retirement savings messages differ based on key household characteristics (e.g., age and income)?

Regarding LMI tax filers' level of interest in opening retirement accounts during the tax season, we anticipated a relatively low rate of engagement with the *my*RA product during the tax season. Blanco and colleagues (2020) found that after study participants received a 50-min educational intervention promoting saving for retirement, 14% of their study participants opened a *my*RA. Given that the interventions in this study were much less time- and resource-intensive, we anticipated overall lower rates of *my*RA engagement. Notably, even if relatively high numbers of people engaged with the *my*RA product, the overall engagement rate may still be low given the size of the LMI tax-filing population in our study.

Regarding the second research question (i.e., effect of messaging content on propensity to open *my*RA account), this study was exploratory in nature, so we did not have strong priors about the relative efficacy of different messaging approaches. However, based on the findings of Bhargava and Manoli (2015) that EITC-eligible tax filers were most responsive to EITC-related messages about maximum EITC payout (i.e., relative to messages about other factors such as ease and convenience of applying for the EITC), we anticipated messages linking *my*RA deposits to larger tax refunds in the future (via tax credits) would be the most effective messages among our sample.

For the third research question regarding the effects of the mode of message delivery on LMI tax filers' propensity to open a *my*RA account (Q3), we expected the intervention delivered through TTFE to have stronger effects than e-mail messages sent before the start of the tax season. We held this expectation for two reasons. First, recipients of the *my*RA e-mail interventions had the option of not reading the e-mails, whereas those receiving the intervention embedded in TTFE software would view at least one screen with *my*RA messaging. Second, messaging about saving for retirement (and savings more generally) potentially could be more salient to tax filers during the tax-filing process. Prior research has found that LMI tax filers were highly responsive to savings interventions delivered *after* they learned the amount of their tax but *before* they decided where to deposit their refund (Roll *et al.*, 2020). Although those studies focused on messages about general savings rather than messages specific to retirement savings, our expectation was that a retirement savings intervention delivered in a similar context would also be effective at driving savings behaviors in the LMI population.

Finally, for the fourth research question (i.e., the differential effects of messaging about retirement savings by household characteristics), we expected messaging about the need for retirement savings

would be more salient for middle-aged filers who were approaching retirement age, and therefore, this group of filers would be more responsive to the interventions. In addition, we also expected the group of LMI tax filers with relatively high incomes – and potentially more budgetary capacity to save – would be more responsive to the interventions.

2.3 Analytical strategy

The random assignment of TTFE users into intervention conditions ensured systematic differences between the intervention groups were minimized, and the average effect of interventions – the intent-to-treat (ITT) estimates – could be effectively measured through pairwise mean comparisons:

$$ITT = \overline{Y_{T1}} - \overline{Y_{T2}}$$

where $\bar{Y}_{T1}$ and $\bar{Y}_{T2}$ are average outcomes for two discrete intervention conditions. Significant differences between treatment groups were assessed using chi-squared tests.[4] Study outcomes varied across the experiments. The study outcome for the e-mail-based experiment was the rate of clicking on the 'Sign up today' button in the e-mail. For the in-product experiment, we explored the extent to which tax filers clicked on the 'learn more' button and then clicked to deposit some or all of the refund into a *my*RA retirement account within TTFE.

2.4 Experimental sample

Figure 1 summarizes the experimental design and sample of 2016 TTFE users. In total, of the 749,207 LMI individuals who used TTFE to file taxes in 2016 and who received tax refunds, 130,280 tax filers were randomly selected to receive one of the three pre-tax season e-mails in December 2015, before the start of the 2016 tax season; 210,568 tax filers were randomly assigned to view one of the three *my*RA tax refund screens during their 2016 tax-filing process using TTFE; and 31,712 tax filers participated in both e-mail and in-product *my*RA experiments. A small number of experimental participants in the in-product experiment had to be dropped due to data errors ($n = 171$), leading to a final analytical sample of 130,280 tax filers in the e-mail experiment, 210,397 in the in-product experiment, and 31,690 in both experiments. The 538,639 tax filers who did not participate in the *my*RA experiments were randomly assigned to a different savings field experiment unrelated to the current study (see Roll *et al.*, 2018).

Table 2 summarizes key demographic and tax characteristics of all 2016 TTFE LMI tax filers who received tax refunds (column 1) as well as study participants in each experiment (columns 2–4). On average, 2016 TTFE tax filers prepared their taxes 44.5 days after the opening of tax season. The majority of TTFE users filed taxes as single (67.6%) and 30.0% claimed dependents. On average, study participants were 35.8 years of age. The average AGI was $14,901, and the average federal tax refund was $1,990. Tax filers submitted an average of 1.5 W-2 forms, which are used to report household wages in separate places of employment among members of the tax household. Of all TTFE users, 41% claimed the federal EITC and 62.2% had health insurance for the full calendar year. Individuals participating in the *my*RA experiments closely resembled the entire population of 2016 TTFE tax filers.

[4]As a robustness check, we also accounted for the fact that we are testing multiple hypotheses in this study – i.e., testing the effect of multiple treatments across multiple outcomes. As the number of statistical tests increases, so too does the risk of committing a type 1 error, or the false-discovery rate. To account for this, we implemented the procedure described by Anderson (2008) to calculate false-discovery rate-adjusted *p*-values for every statistical test conducted in the main analysis. Adjusting for the false-discovery rate across these tests did not lead to any loss of statistical significance. Results are available upon request.

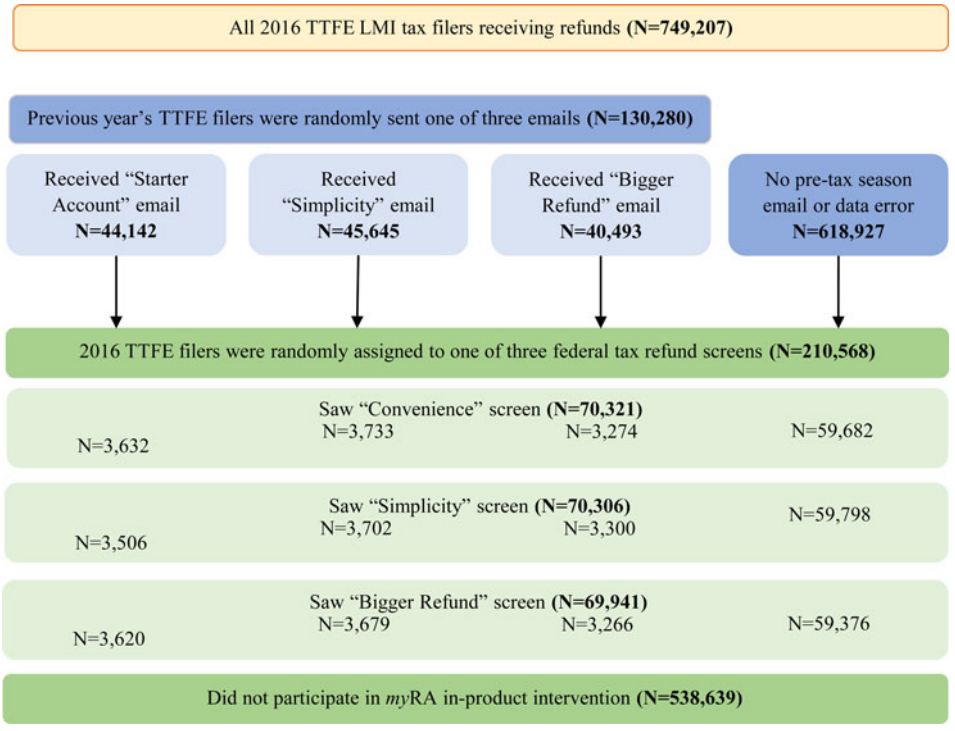

Figure 1. Experimental design and sample.

2.5 Limitations

Although this study makes substantial contributions to several bodies of literature, it is not without its limitations. Due to regulatory requirements, tax filers could not open *my*RA accounts during the online tax-filing process. As such, we could measure only the rate at which tax filers clicked on the option to deposit to *my*RAs, which redirected them to a different website, and we could not measure the rate at which they completed opening *my*RA accounts or how much they contributed to their accounts. Another limitation stems from our lack of data showing the ways that filers interacted with *my*RA outside of the tax product. For example, we could not observe if a filer exposed to the intervention later sought out information on *my*RA or opened an account outside of the TTFE platform (e.g., via the myRA.gov website). Therefore, our data likely provide a lower bound on the number of filers willing to engage with a retirement savings product. Due to the discontinuation of the *my*RA program, we cannot know if allowing tax filers to open *my*RAs at tax time would have significantly bolstered enrollment and participation in the *my*RA program.

Another limitation of this study is the lack of a true control group. Although both messaging modes (i.e., e-mails and in-product message components) used to deliver *my*RA-related content were randomized, we did not explicitly construct a control group that would receive messages such as a generic notification or framing around *my*RA. Part of the reason for this decision was the newness of the *my*RA program. We believed that awareness of the program was likely extremely low, and therefore, a neutral framing around an unknown product might not convey enough information for tax filers to understand *my*RA. Additionally, part of the purpose of this field experiment was to drive interest and enrollment in *my*RA to the maximum degree possible, which a neutral framing might not do. We also cannot fully tease out the specific mechanisms driving the observed behaviors. Although the screens and e-mails differed between interventions, we did not vary specific components of each intervention (e.g., the pictures and the text). Thus, we are able to assess differences in the overall impact of

Table 2. Sample summary statistics

	All 2016 TTFE tax filers (1) Mean (SD)	Experiment 1: e-mail intervention (2) Mean (SD)	Experiment 2: in-product intervention (3) Mean (SD)	Experiments 1 + 2: e-mail and in-product interventions (4) Mean (SD)
Tax-filing date (days from season opening)[a]	44.5 (29.54)	41.5 (29.07)	43.4 (28.95)	39.62 (28.55)
Age (years)	35.8 (16.12)	37.7 (15.81)	35.2 (16.14)	37.9 (16.07)
Filing status				
Single (%)	67.6	68.2	69.1	69.6
Head of household (%)	22.0	18.7	22.0	19.1
Married filing jointly (%)	9.6	12.3	8.2	10.6
Claimed dependents (%)	30.0	28.3	29.1	27.4
AGI ($)	14,901.20 (10,057.72)	17,118.63 (10,215.57)	14,326.38 (9,852.05)	16,766.28 (9,988.50)
Federal tax refund ($)	1,990.45 (2,376.49)	1,997.52 (2,324.16)	1,938.58 (2,363.69)	1,963.93 (2,314.35)
Number of W-2 forms	1.50 (1.02)	1.52 (1.03)	1.48 (0.98)	1.47 (0.98)
Received EITC (%)	40.5	41.0	39.3	40.2
Reported health insurance for the full year (%)	62.2	68.6	60.2	67.8
Final analytical sample	749,207	130,280	210,397	31,690

[a]2016 tax season lasted 90 days.
Source: Administrative tax data.

the interventions, but we cannot categorically identify the specific intervention components driving the differences. Finally, the experiment was conducted on a population of LMI online tax filers. The observed effects of the interventions might be different if the experiments are translated into a different setting such as in-person tax filing or administered to a different population.

3. Results

Table 3 reports the topline results from the e-mail experiment (experiment 1). The rate of opening the pre-season e-mail was similar across intervention groups (column 1), which is to be expected given that the pre-tax season e-mails had identical subject lines and sender names. However, we did observe notable differences across intervention groups when we looked at the rate of clicking to sign up for *my*RA. Among recipients of the e-mail emphasizing the bigger refund, 1.4% clicked to sign up for *my*RA (column 2). Although the base rate of clicking to sign up was low, recipients of the 'bigger refund' e-mail had a rate of clicking to sign up for *my*RA that was more than 50% higher than the rate of those who received the 'starter account' e-mail. The 'simplicity' e-mail had a more modest impact; as compared with the 'starter account' e-mail, the 'simplicity' message increased the rate of clicking to sign up for *my*RA by roughly 22%. Conditional on having opened the e-mail, the rates of clicking to sign up for *my*RA followed a similar pattern, and the overall rates of clicking to sign up for *my*RA among e-mail openers was around 3–4%, depending on the intervention (column 3).[5]

Table 4 shows the results from the in-product experiment (experiment 2). Similar to the e-mail experiment, results from the in-product experiment showed the general level of interest in *my*RA was low. However, we did observe some interesting variation between intervention conditions in the rate of clicking to learn about and selecting to deposit to *my*RA. In the in-product experiment, those who saw the 'convenience' and 'simplicity' screens clicked to learn more about *my*RA at similar rates – 1.69% and 1.60%, respectively (column 1). However, tax filers who were randomized into the 'bigger refund' intervention were more than twice as likely as other participants (i.e., who saw the

[5]Tables E1 and E2 in the Appendix presents the results of significance tests comparing every intervention condition in experiment 1 to every other intervention condition. These results show that the 'simplicity' and 'bigger refund' intervention conditions were also statistically significant from each other in terms of rates of clicking to sign up for *my*RA.

Table 3. E-mail intervention results

		Clicked to sign up	
	E-mail opened	Full sample	E-mail opened
Intervention	(1)	(2)	(3)
Starter account	34.0	0.9	2.7
Simplicity	33.3*	1.1**	3.4**
Bigger refund	34.2	1.4**	4.0**
Observations	130,280	130,280	44,032

Different from starter account: *p < 0.05; **p < 0.01. Statistical significance assessed through chi-squared tests.
Source: Administrative tax data.

Table 4. In-product experiment results

	Experiment 2			*Experiments 1 and 2: e-mail and in-product interventions*	
	In-product intervention				
	Full sample		Clicked to learn more		
Intervention	Clicked to learn more (1)	Selected to deposit (2)	Select to deposit (3)	E-mail opened Selected to deposit (4)	E-mail not opened Selected to deposit (5)
Convenience	1.6	0.36	22.7	0.28	0.25
Simplicity	1.69	0.30*	17.8**	0.46**	0.37
Bigger refund	3.57**	0.57**	15.8**	1.1**	0.68**
Observations	210,568		4,809	10,440	21,272

Different from convenience: *p < 0.05; **p < 0.01. Statistical significance assessed through chi-square tests.
Source: Administrative tax data.

other message screens) to click to learn more about *my*RA. Overall, 3.57% of filers in the 'bigger refund' group sought more information about *my*RA. We observed a similar pattern when we looked at the full sample's rate of selecting to deposit to *my*RA, although the rates of clicking to deposit are roughly one-sixth as high as the rates of clicking to learn more (column 2). Interestingly, when we examined the rate of selecting to deposit to *my*RA conditional on clicking to learn more about *my*RA (column 3), a different pattern emerged. Although the rate of clicking to learn more about *my*RA was the lowest for filers who saw the 'convenience' screen, the rate of clicking to deposit – conditional on having clicked to learn more – was the highest for the filers in the 'convenience' group. More than 20% of filers who saw the 'convenience' screen and then clicked 'learn more' to access more information about *my*RA also clicked the option to make a deposit to *my*RA, which is a significantly higher rate than we observed in either the 'simplicity' or 'bigger refund' groups.[6]

Finally, columns 4 and 5 of Table 4 compare the effects of the in-product interventions (from experiment 2) on the rate of selecting to deposit to *my*RA by the whether the filer opened the pre-season e-mail (from experiment 1). Within each in-product intervention condition, tax filers who opened their pre-season e-mails were more likely to select to deposit to *my*RA than filers who did not open their pre-season e-mail; however, this difference was statistically significant only for filers who saw the 'bigger refund' screen. Notably, even after factoring in the opening of the pre-season e-mails, we observed the 'bigger refund' intervention remained the most effective in-product intervention condition.

[6]Table E2 in the Appendix presents the results of significance tests comparing every intervention condition in experiment 2 to every other intervention condition. These results show that the 'simplicity' and 'bigger refund' groups exhibited significantly different rates of clicking to learn more about *my*RA and clicking to deposit to *my*RA, but that the groups were statistically identical in terms of clicking to deposit to *my*RA conditional on clicking to learn more about the product.

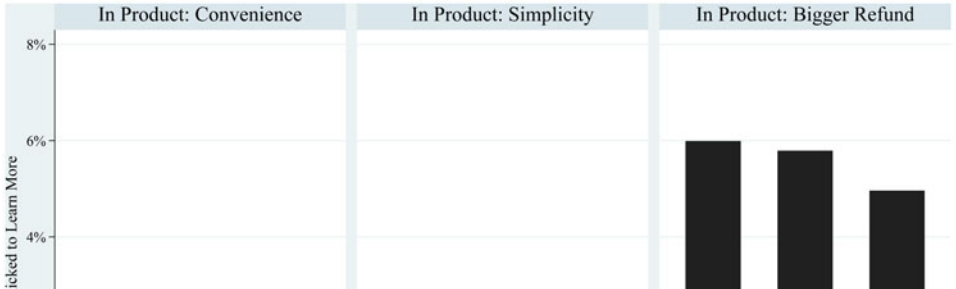

Figure 2. Rate of clicking through to learn more about *my*RA, by pre-season e-mail and in-product intervention group ($N = 31,712$). Chi-squared tests indicate that the rate of clicking to learn more about *my*RA did not differ between e-mail groups within in-product intervention groups at the 0.05 level. *Source:* Administrative tax data.

Figure 2 illustrates the interaction between the e-mails and in-product interventions by comparing the rates of clicking to learn more about *my*RA in TTFE for individuals who participated in both interventions.[7] These results highlight the magnitude of the impact of the 'bigger refund' in-product intervention on clicking to learn more about *my*RA, relative to the other in-product intervention conditions. Among each of the three pre-season e-mail groups, at least 5.0% of the time filers who saw the 'bigger refund' screen during tax-filing clicked the option to learn more about *my*RA. Among the other combinations of e-mails and in-product interventions, the rate of clicking to learn more ranged from 1.8% to 2.6%, a statistically significant difference. Moreover, Figure 2 suggests the effect of the in-product intervention was not dependent on which pre-season e-mail the tax filer received. However, within each of the in-product intervention groups, we found no statistically significant differences across e-mail intervention groups in the rate of clicking to learn more about *my*RA.

Similarly, Figure 3 illustrates how the rates of choosing to learn more about *my*RA differed for filers who did and did not open their pre-season e-mail, by the type of e-mail and in-product intervention screen. Interestingly, only one combination of e-mail and in-product intervention – the 'simplicity' e-mail with the 'bigger refund' screen – was found to have a statistically significant difference in the rate of clicking to learn more about *my*RA between e-mail openers and non-openers. This finding suggests the pre-season e-mail did not have a substantial impact on the filers' in-product decisions on engagement with *my*RA.

3.1 Subsample analyses

In this section, we examine the extent to which the impact of the in-product interventions differed based on the tax filer's age and AGI. In these subsample analyses, we show the results for participants in the in-product experiment (regardless of whether they received a pre-season e-mail). First, we examined differences in the interventions by the age of the tax filer because younger filers might stand to benefit more from retirement deposits due to compounding interest, but older filers have a more acute need to save for retirement as their retirement dates are more imminent. Figure 4a compares the rate of clicking to learn more about the *my*RA program by in-product intervention group

[7]The patterns of clicking to deposit were very similar to those of clicking to learn more (but at lower absolute values). These results are available upon request from the authors.

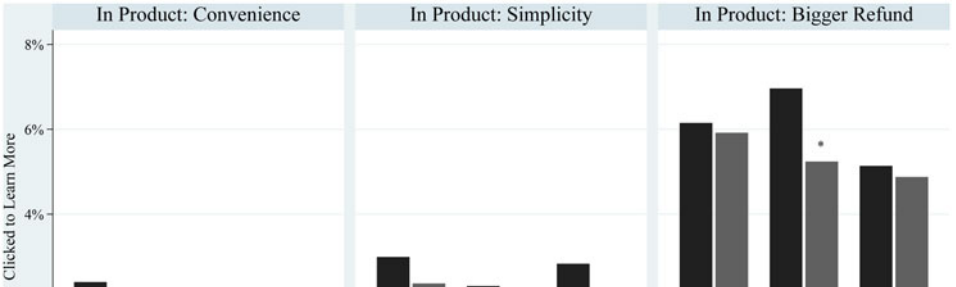

Figure 3. Clicking to learn more about *my*RA, by pre-season e-mail opening and in-product intervention group ($N = 31{,}712$). Rate of clicking to learn more about *my*RA is different from openers, *$p < 0.05$. Statistical significance assessed through chi-squared tests. *Source:* Administrative tax data.

across different three age groups: 15–34 years, 35–54 years, and 55–64 years. We excluded filers 65 years or older from this analysis because they are likely at the point of drawing down on their retirement and would not have as much need for a new retirement savings product like *my*RA. Interestingly, despite the fact that filers in different age categories likely have very different retirement savings needs, the rate of clicking to learn more about *my*RA was generally similar across age groups. We observed only one statistically significant difference across age groups, which was among filers who saw the 'bigger refund' in-product intervention. In this in-product intervention group, filers 35–54 years and 55–64 years were more likely to click to learn more than filers 15–34 years.

However, when we examined the rate of actually selecting to deposit to *my*RA by age group within in-product interventions (Figure 4b), some interesting patterns emerged. Although the rate of clicking to learn more about *my*RA did not statistically differ across age groups among filers who saw the 'convenience' screen, we observed differences in the rate of selecting to actually deposit to *my*RA. Among those who saw the 'convenience' screen, filers aged 35–54 were more likely to select to deposit to *my*RA than filers aged 15–34. However, filers aged 55–64 were no more likely than younger filers to select to deposit to *my*RA. We found a similar pattern when looking at the rate of selecting to deposit for those who saw the 'bigger refund' screen. Filers in the middle age group (35–54 years) were more likely to select to deposit to *my*RA than those in the youngest age group (15–34 years). However, those closest to retirement age (55–64 years) were no more likely than those in the youngest age group to select to deposit to *my*RA. It is not entirely clear why the increased interest in learning about *my*RA among older LMI filers does not translate to increased rates in clicking to deposit to a *my*RA. It is possible that, after these filers learned more about the product, they concluded that *my*RA did not meet their pre-retirement needs. Alternatively, older filers may have realized that they needed a retirement savings option with higher yields than *my*RA to meet their retirement savings needs.

Next, we examined the impacts of the in-product interventions by the AGI of tax filers within each intervention group. Even within our low-income sample, income might differentiate responsiveness to both *my*RA and the interventions. Higher-income tax filers might have more financial capacity to save for longer-term planning, and therefore, find *my*RA appealing, whereas lower-income filers might be more responsive to the promise of larger refunds or the no-fee account structure. Notably, higher-income tax filers also tend to receive much larger refunds. For example, among those who saw the

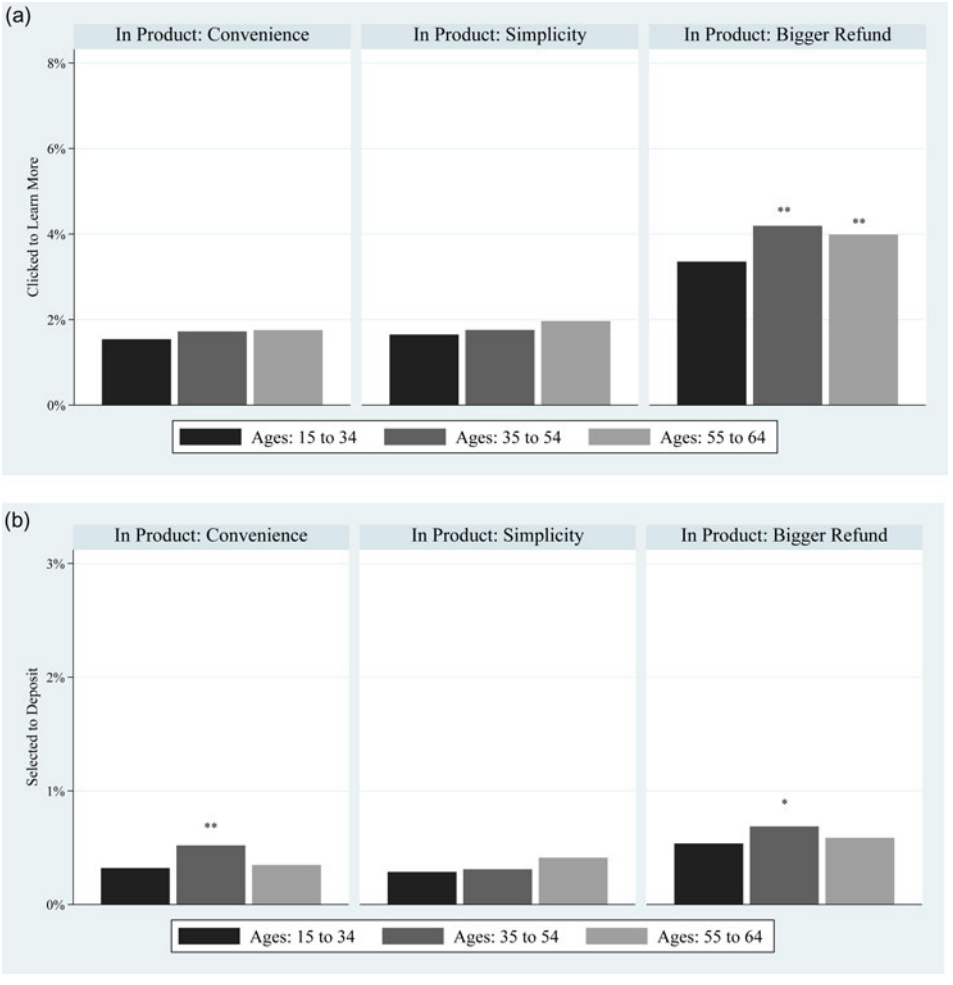

Figure 4. (a) Rate of clicking to learn more about *my*RA across in-product intervention groups, by age ($N = 197,591$). Rate of clicking to learn more about *my*RA is different from filers aged 15–34. **p < 0.01. Statistical significance assessed through chi-squared tests. *Source:* Administrative tax data. (b) Rate of selecting to deposit to *my*RA across in-product intervention groups, by age ($N = 197,591$). Rate of selecting to deposit is different from filers aged 15–34, *p < 0.05, **p < 0.01. Statistical significance assessed through chi-squared tests. *Source:* Administrative tax data.

'bigger refund' screen, the average federal refund for filers in the highest income category (an AGI over $30,000) was $4,024, or more than 15 times larger than the average refund of those in the lowest income category (an AGI between $0 and $10,000). Figure 5a shows the rate of clicking to learn more about *my*RA by AGI for each in-product intervention group. The between-income group differences in the rate of clicking to learn more were statistically insignificant in both the 'simplicity' and 'convenience' intervention groups. However, in the 'bigger refund' intervention we observed a positive relationship between the likelihood of clicking to learn more about *my*RA and AGI levels. Given the correlation between income and refund size in our sample, it might be that relatively high-income filers (i.e., in comparison with other LMI filers) view the refund as more central to their overall finances, and therefore, have greater interest in a product that might allow them to receive a larger refund in the future. Alternatively, filers at the upper range of LMIs might simply have had a larger refund amount that allowed them to apply the refund to a more diverse array of needs, including long-term savings, than their counterparts with lower incomes.

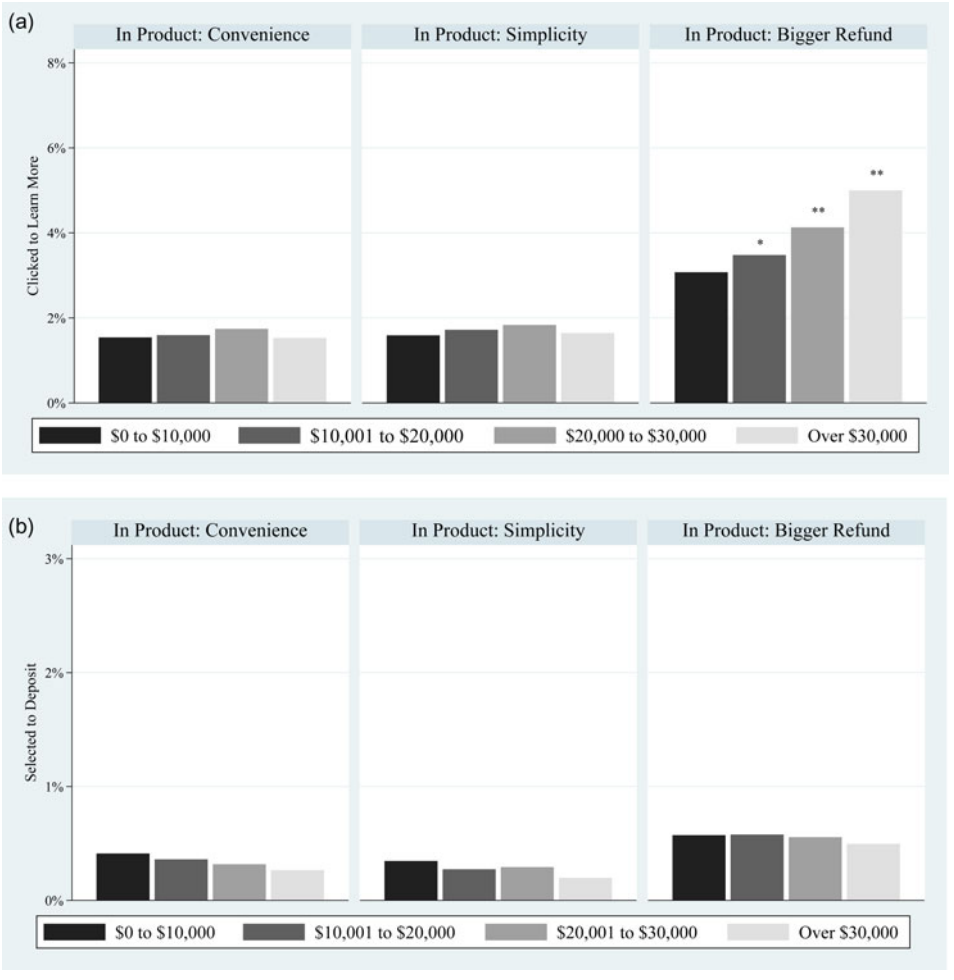

Figure 5. (a) Rate of clicking to learn more about *my*RA across in-product intervention conditions, by AGI ($N = 210{,}568$). Rate of clicking to learn more about *my*RA is different from \$0 to \$10,000, *$p < 0.05$; **$p < 0.01$. Statistical significance assessed through chi-squared tests. *Source:* Administrative tax data. (b) Rate of selecting to deposit to *my*RA across in-product intervention conditions, by AGI ($N = 210{,}568$). Rate of selecting to deposit did not differ between e-mail groups within in-product intervention groups at the 0.05 level. Statistical significance assessed through chi-squared tests. *Source:* Administrative tax data.

Figure 5b compares the rates of selecting to deposit to *my*RA by income category for each of the in-product intervention groups. Interestingly, despite large differences in clicking to learn more about *my*RA across income groups, we found no statistically significant differences across in-product intervention groups in the rate of selecting to deposit to *my*RA. Although the 'bigger refund' intervention was more effective at increasing the rate of clicking to learn more about *my*RA for higher-income LMI filers, the intervention did not have any differential impact on the rate of clicking to deposit to *my*RA.

4. Discussion

This paper presents the results of a large-scale field experiment that tested the extent to which different e-mail messages and messages embedded in an online tax-filing environment could motivate LMI tax filers to open and fund a *my*RA account. At the time of the experiment, *my*RA was a new publicly sponsored retirement account administered by the U.S. Department of the Treasury. We draw two

major conclusions from this analysis. The first is that overall interest in opening retirement accounts at tax time is extremely low, at least among LMI online tax filers, and that the vast majority of these tax filers are unreceptive to any of an array of messages we tested to promote *my*RA. The most effective intervention condition, which referenced the potential to get additional tax credits through the Saver's Credit if filers opened a *my*RA, drove only 0.6% of tax filers to select to deposit to a *my*RA. For LMI tax filers who received and opened a pre-season e-mail, the rate of selecting to deposit increased to 1.1%. Although it is possible that this low level of interest in *my*RA is due to the characteristics of the accounts themselves – which promised much lower rates of return (around 2%) than what households would receive in a typical year if they invested their tax refund in a total stock market index fund – it is also possible that most LMI households simply do not view tax time as an opportune moment to build retirement savings. The tax time explanation seems likely because prior research has found that only 5% of LMI tax filers who saved their refunds deposited their refunds into any retirement account and 18% of those who saved the refund reported saving it for retirement or other long-term goals (Grinstein-Weiss *et al.*, 2015; Thompson *et al.*, 2020). By contrast, more than three-fourths of LMI tax filers who saved their refund reported saving it for short-term goals such as emergency savings. These findings are also consistent with a study on the predictors of retirement planning behaviors, which found LMI households are generally less likely to engage in retirement planning behaviors than their higher-income counterparts (Lusardi and Mitchell, 2007). Given this, products and interventions aimed at promoting long-term and retirement savings may simply have less relevance for LMI households.

The second major conclusion is that LMI tax filer interest in *my*RAs can be motivated – to some extent – by messaging. Both the e-mail and the in-product intervention conditions with messaging about receiving additional tax credits (via the Saver's Credit) through *my*RA deposits drove increased engagement with *my*RA at tax time. This finding is similar to the results of a field experiment by Bhargava and Manoli (2015) in which tax filers' receipt of letters highlighting the maximum benefit from the EITC was associated with increased rates of claiming the EITC, relative to other messaging approaches. It is likely that the messaging in our study regarding the Saver's Credit qualifying them for a larger refund in the future resonated with LMI filers because the refund is so integral to many LMI households' finances (Roll *et al.*, 2018) and because messaging around higher future payouts is easy to understand and has almost universal appeal. Qualitative research has also shown that LMI households, many of whom cannot purposively adjust their labor supply to maximize their tax refund, often seek to maximize their tax refund payouts through relatively costless changes in tax-filing decisions such as adjusting their tax withholding (Edin *et al.*, 2014). As such, the Saver's Credit might have appealed to these tax filers because it seemed like a way to get a larger tax refund for a minimal cost. However, although the messaging about the Saver's Credit was simple, the credit itself is not. Relying on this credit to drive interest in *my*RA might have introduced additional complexities in the tax-filing process for filers, particularly given the non-refundable structure of the credit and the limitation that the potential benefits would be generated in the following tax season.

Although the 'bigger refund' condition was generally more appealing, we observed one interesting exception. As compared with those who saw the 'convenience' messaging and sought more information about the *my*RA, those who saw the 'bigger refund' messaging in TTFE and clicked on the option to learn more about the product were much less likely to select the option to deposit into a *my*RA. This finding held even though the 'bigger refund' messaging drove higher rates of information seeking, and speaks to the complicated interaction between different messaging approaches. A possible explanation is that the information conveyed to tax filers who clicked to learn more about *my*RA focused on the simple, affordable, and safe components of *my*RAs (see Figure C4 in the Appendix), rather than information about additional credits for which filers could receive from saving in a *my*RA. Therefore, messaging about higher future payouts might be salient and drive engagement with a product (i.e., drive higher rates of information seeking and depositing behaviors in general) but such engagement might be fragile and might not persist if the messaging about future payouts is not reinforced. By contrast, the 'convenience' messaging condition is complemented in many ways by the additional information

on the 'learn more' screen, which might have made the conjunction of 'convenience' messaging and information on the simplicity, safety, and affordability of *my*RA more effective.

The low rate of clicking to deposit to a *my*RA underscores the fact that it is especially difficult for LMI households to build savings for long-term goals such as retirement. It might be that motivating financially constrained populations to save for retirement requires higher-touch interventions that go beyond simple messaging. For example, Blanco *et al.* (2020) demonstrated that a 50-min intervention consisting of a 30-minute financial education session and a 20-minute walk-through on how to create a *my*RA account online had much larger effects on rates of *my*RA account opening than the interventions in our study. Indeed, the extremely low-touch interventions presented in this paper typically added just a few seconds to the entire tax-filing process. Alternatively, given the low level of interest in *my*RA, some unions, employers, and policymakers might also view these findings as evidence that a defined benefit retirement structure could be more beneficial for LMI households, many of whom lack savings to cover even small emergencies, much less building their retirement assets.

This study is among the first field experiments testing ways of driving enrollment intentions in a new retirement savings product. Our findings make a substantial contribution to the literature on retirement savings field experiments (e.g., Madrian and Shea, 2001; Choi *et al.*, 2002, 2004; Thaler and Benartzi, 2004; Carroll *et al.*, 2009), which typically do not focus explicitly on promoting retirement savings in LMI households. In addition, this study makes a contribution to the growing literature around the use of the tax refund to build savings, which typically focuses on encouraging general purpose or emergency savings (e.g., Grinstein-Weiss *et al.*, 2017*a*, *b*; Roll *et al.*, 2018) or bond purchases (Tufano, 2011). Although two other studies have focused on the intersection between tax filing and retirement savings deposits (Duflo *et al.*, 2006; Saez, 2009), those studies focused on an in-person tax-filing environment rather than online tax filing and their interventions included the use of financial incentives to promote retirement savings contributions. In examining interventions that can be incorporated into online tax environments for little to no marginal cost (e.g., messaging changes to filing screens and e-mails), our study speaks to the potential – and equally important, to the limitations – of more affordable and scalable efforts to promote retirement savings among LMI households.

Of course, one of our key findings is that implementing relatively costless and easily scaled interventions to promote retirement savings among LMI tax filers has limited impact on driving overall enrollment levels. Compared with the large effects seen from shifting retirement savings contributions from opt-in to opt-out (Madrian and Shea, 2001) and the somewhat large effects from providing 20% or 50% contribution matches for IRA deposits at tax time (Duflo *et al.*, 2006), the effects in our study are quite modest. These modest effects are in-line with several other studies using messaging to influence tax-related behaviors (e.g., Grinstein-Weiss *et al.*, 2017*a*, *b*; Bergman *et al.*, 2019), and it is to a degree unsurprising that these interventions are less effective than providing direct financial incentives or changing decision defaults. However, the fact that simple shifts in messaging could nearly double the rate of households clicking a link to deposit into a *my*RA speaks to the utility of message-based interventions in helping households navigate complex financial decisions. Thus, this finding validates and extends other research studies on the use of messaging to promote various financial behaviors (e.g., Bertrand *et al.*, 2010; Hershfield *et al.*, 2011; Berg and Zia, 2013).

In addition to the study limitations we have discussed earlier, the participants in these experiments were all LMI online tax-filers and were not necessarily representative of the broader LMI population. For example, previous research on TTFE filers has shown that they tend to be younger, better-educated, and disproportionately White than the broader LMI population (Gallagher *et al.*, 2019). Additionally, all experiment participants had the technological skills and financial knowledge to navigate through the TTFE tax preparation and filing software on their own. As such, there may be reason to believe that the effects of the various messaging strategies would have differed if they had been administered to the broader LMI population.

5. Conclusion

Although *my*RA was discontinued in 2017, this study has broad relevance for the design and implementation of retirement savings policies and programs, as well relevance to the bodies of research on interventions promoting retirement savings at tax filing and more generally. This study, in conjunction with the one other study on *my*RA enrollment (Blanco *et al*., 2020), can inform state-level efforts to establish public retirement savings account programs, as is currently underway in several states in the United States. The limited literature that has emerged as a result of the short-lived *my*RA program indicates that both high-touch interventions (e.g., Blanco *et al*., 2020) and low-touch interventions such as those in our study can be effective components of a broader strategy to promote LMI households' participation in public retirement accounts. Nevertheless, these findings also point to the difficulty in encouraging the majority of LMI households to enroll in these programs, likely because these households face a wide variety of short-term financial needs and persistent financial constraints that make retirement savings less feasible.

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. All TurboTax Freedom Edition screenshots used with permission from Intuit. All rights reserved.

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Appendix A: Comparison of treatment groups on observable characteristics

Table A1. Comparison of experiment 1 treatment groups

	Starter account	Simplicity	Bigger refund
AGI ($)	17,204	17,178	16,959
Birth year	1,978.3	1,978.5	1,978.7
Any dependents (%)	28.6	28.4	28.0
Refund ($)	2,010	2,010	1,970
Any EITC (%)	41.5	40.8	40.6
Filing status			
Single (%)	67.6	68.3	68.7
Head of household (%)	19.0	18.8	18.3
Married, filing jointly (%)	12.5	12.1	12.1
Married, filing separately (%)	0.8	0.8	0.9
Mean filing date (days after opening of tax season)	41.4	41.4	41.6
N	44,142	45,645	40,493

Chi-squared tests indicate that there were no statistically significant differences between treatment groups.
Source: Administrative tax data.

Table A2. Comparison of experiment 2 treatment groups

	Convenience	Simplicity	Bigger refund
AGI ($)	14,340	14,312	14,357
Birth year	1,980.9	1,981.1	1,980.9
Any dependents (%)	29.1	29.2	29.0
Refund ($)	1,943	1,943	1,934
Any EITC (%)	39.3	39.3	39.3
Filing status			
Single (%)	69.0	69.0	69.1
Head of household (%)	22.0	22.1	21.8
Married, filing jointly (%)	8.2	8.1	8.2
Married, filing separately (%)	0.8	0.8	0.8
Mean filing date (days after opening of tax season)	43.4	43.4	43.5
N	70,321	70,306	69,941

Chi-squared tests indicate that there were no statistically significant differences between treatment groups.
Source: Administrative tax data.

Appendix B: Pre-tax season *my*RA e-mails sent to previous year's TTFE filers

Figure B1. Display of 'Starter Account' e-mail.

Figure B2. Display of 'simplicity' e-mail.

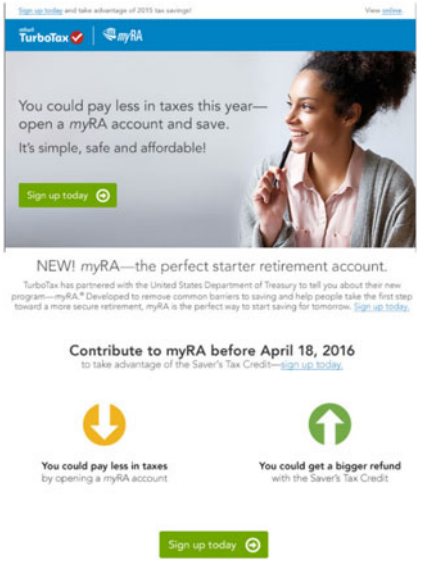

Figure B3. Display of 'bigger refund' e-mail.

Appendix C: *my*RA-related in-product screen displays

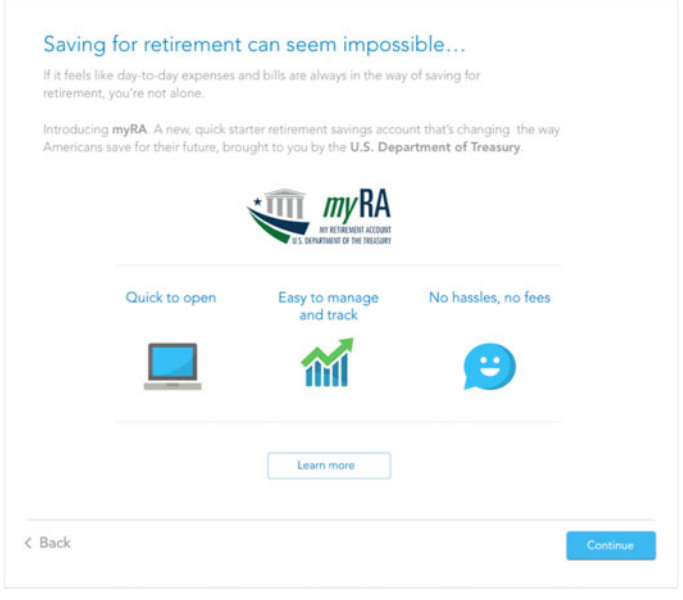

Figure C1. Display of 'convenience' screen.

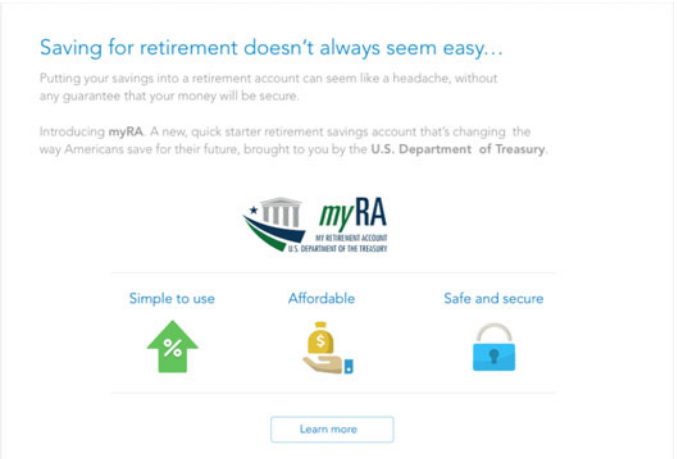

Figure C2. Display of 'simplicity' screen.

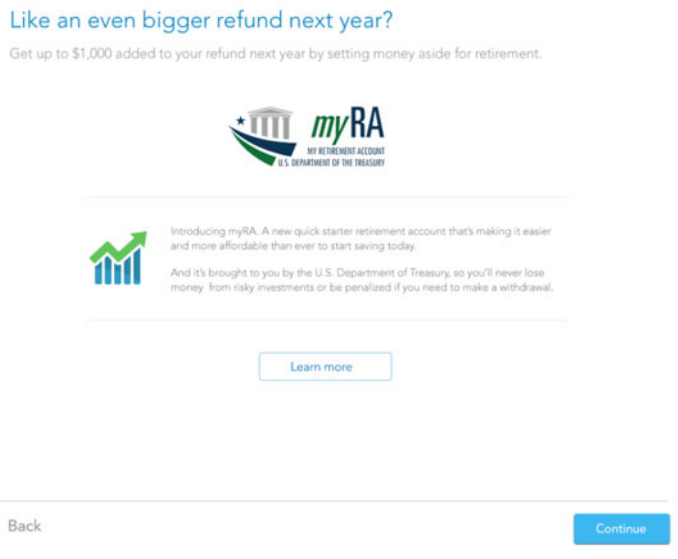

Figure C3. Display of 'bigger refund' screen.

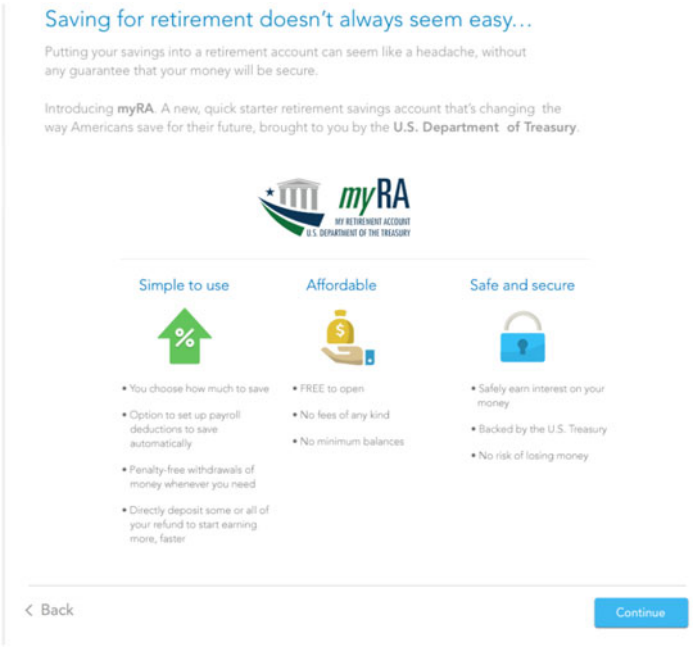

Figure C4. 'Learn More' expansion screen shown if tax filers clicked on the 'Learn More' button.

Appendix D: *my*RA-related refund screen displays

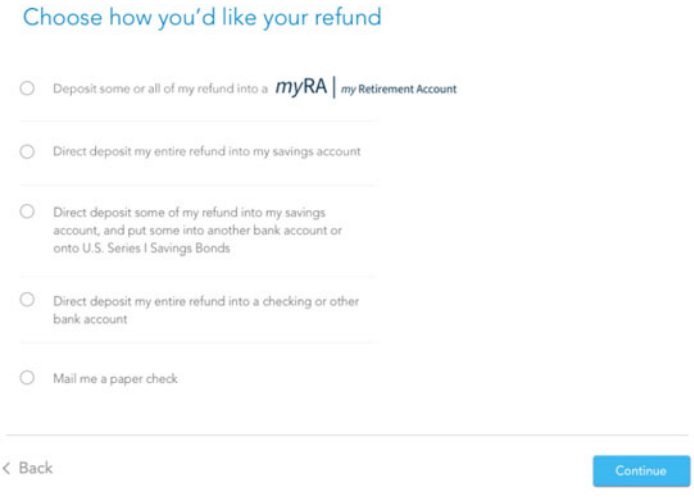

Figure D1. Display of tax refund deposit screen.

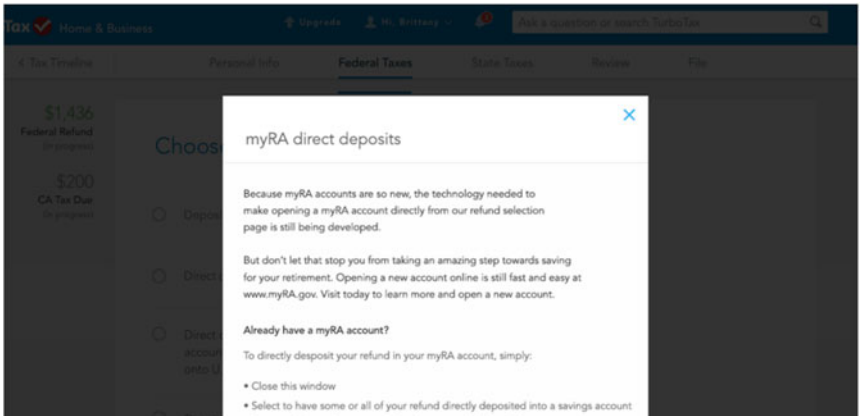

Figure D2. Pop-up screen shown if tax filers clicked to deposit to *my*RA retirement account.

Appendix E: Comparing all treatment conditions against each other

Table E1. p-Values for pairwise comparisons in experiment 1

Intervention	Starter account	Simplicity	Bigger refund
Panel A. p-*value comparison of opening e-mails across all e-mail treatment conditions*			
Starter account		0.265	0.5398
Simplicity	0.0265		0.0053
Bigger refund	0.5398	0.0053	
Panel B. p-*value comparison of clicking to sign up for* my*RA across all e-mail treatment conditions (full sample)*			
Starter account		0.0026	0.0000
Simplicity	0.0026		0.0001
Bigger refund	0.0000	0.0001	
Panel C. p-*value comparison of clicking to sign up for* my*RA across all e-mail treatment conditions (conditional on e-mail opening)*			
Starter account		0.0004	0.0000
Simplicity	0.0004		0.0067
Bigger refund	0.0000	0.0067	

This table presents the p-values from chi-squared significance tests for every potential comparison of intervention conditions in experiment 1. Although Table 3 presents significance tests using the starter account condition as the reference group, this table includes tests of every condition against each other (e.g., starter account against 'simplicity,' 'simplicity' against 'bigger refund').
Source: Administrative tax data.

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Table E2. p-Values for pairwise comparisons in experiment 2

Intervention	Convenience	Simplicity	Bigger refund
Panel A. p-values of clicking to learn more across all in-product treatment conditions			
Convenience		0.1846	0.0000
Simplicity	0.1846		0.0000
Bigger Refund	0.0000	0.0000	
Panel B. p-values of selecting to deposit to myRA across all in-product treatment conditions (full sample)			
Convenience		0.0498	0.0000
Simplicity	0.0498		0.0000
Bigger Refund	0.0000	0.0000	
Panel C. p-values of selecting to deposit to myRA across all in-product treatment conditions (conditional on clicking to learn more)			
Convenience		0.0033	0.0000
Simplicity	0.0033		0.1258
Bigger Refund	0.0000	0.1258	

This table presents the p-values from chi-squared significance tests for every potential comparison of intervention conditions in experiment 2. Although Table 4 presents significance tests using the 'convenience' condition as the reference group, this table includes tests of every condition against each other (e.g., 'convenience' against 'simplicity,' 'simplicity' against 'bigger refund').

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