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Personalized Reminders: Evidence from a Field Experiment with Voluntary Retirement Savings in Colombia*

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Abstract

A large share of the global workforce lacks access to employer-sponsored retirement plans. In Colombia, where labor informality is high, the government introduced the Beneficios Económicos Periódicos (BEPS) program to promote voluntary retirement savings. However, many enrollees fail to contribute regularly. We conduct a randomized controlled trial with 2,819 BEPS users, assigning them to different planning and monthly reminder treatments, where reminders are tailored in their timing. We find that personalized reminders significantly increase both the frequency and amount of savings, with individuals who recognize their forgetfulness more likely to demand reminders. Our findings highlight the role of reminders tailored to individuals' preferred timing in sustaining engagement in voluntary savings programs.

Keywords: Retirement savings, personalized reminders, limited attention, financial inclusion.

JEL codes: D91, G41, O16.

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1. Introduction

More than 60 percent of the global workforce is employed in the informal sector, with stark implications for inequality throughout the life cycle (Bonnet et al., 2019). One of the most pressing concerns is old-age poverty, as many informal workers lack access to employer-sponsored pension systems and social protections. Colombia, a country with persistently high levels of labor informality, faces serious challenges in ensuring retirement security for its population. As of 2020, only 26 percent of elderly Colombians received a retirement pension (DANE, 2021), and in the first quarter of 2022, just 57 percent of employed individuals in major cities were enrolled in the mandatory pension system (DANE, 2022a). Recognizing these coverage gaps—particularly for informal workers—the Colombian government introduced the Beneficios Económicos Periódicos (BEPS) program as an alternative mechanism to promote retirement savings.

BEPS is a voluntary savings program designed for Colombians earning less than the minimum wage, a group that represented nearly 45 percent of the employed population in 2022 (DANE, 2022b). Unlike the mandatory pension system, BEPS functions as a flexible, contribution-based scheme, allowing participants to save at their own pace without fixed monthly requirements. At retirement age, savings are converted into life annuities, providing financial support in old age. While this flexibility makes the program accessible, it also presents a major challenge: encouraging individuals to actively save. As of 2021, approximately 1.6 million people were enrolled in BEPS, yet only about 50 percent had made any contributions to their accounts (Colpensiones, 2021).

Several factors may contribute to low rates of retirement savings, including limited access to the formal financial system (Dupas and Robinson, 2013; Prina, 2015), a lack of financial literacy (Lusardi and Mitchell, 2011), and behavioral constraints such as procrastination (Thaler and Benartzi, 2004) and limited attention (Karlan et al., 2016). The latter is particularly relevant for informal workers, whose voluntary retirement savings require deliberate and sustained engagement with a future benefit that may not be sufficiently salient—an issue less common among formal workers. Addressing this challenge is the central focus of this study.

In this paper, we conduct a randomized controlled trial in collaboration with Colpensiones, Colombia's public pension fund, to examine the impact of personalized reminders

on retirement savings behavior among adults enrolled in BEPS. Personalized reminders can influence savings through at least three mechanisms. First, particularly when tailored to individual needs, reminders should increase savings by keeping it top-of-mind. Second, reminders may encourage individuals to actively engage in financial planning, prompting them to consider when and how they will save.[1] Third, reminders could heighten the salience of the long-term benefits of saving for retirement, reinforcing the importance of consistent contributions.

Our intervention begins with an online survey of 2,819 BEPS users, followed by a four-month intervention period. Participants are randomly assigned to one of three treatment groups, in which they are asked to formulate a saving plan, specifying one date per month when they believe it would be optimal to save. The primary treatment, *Personalized reminders (F)*, involves sending reminders each month, aligned with the participant's savings plan. A second treatment, *Personalized reminders (C)*, follows a similar structure but explicitly allows participants to opt out of receiving reminders. To disentangle the effects of personalized reminders, we compare these groups to two additional conditions: (i) a *Plan only* treatment, where participants develop a savings plan but do not receive reminders, and (ii) a *Control* group, in which participants engage with content that is common across treatments, including a short set of survey questions and information about some of the benefits of consistently saving into BEPS.

We find that personalized reminders increase both the number of deposits made during the study period and overall savings. While part of this effect can be attributed to the act of formulating a plan, the *Plan only* treatment does not consistently lead to statistically significant increases in savings. In the *Personalized reminders (C)* treatment, we observe that individuals with established saving habits—those who saved more frequently and consistently in the year prior to the intervention—tend to opt out of receiving personalized reminders, suggesting that some perceive them as imposing hassle costs. Conversely, individuals who recognize their own limited attention to saving are more likely to demand reminders, implying that such self-awareness may facilitate the adoption of tools that help individuals achieve their savings goals. In the *Personalized reminders (F)* treatment, we also test whether

[1]Several studies indicate that prompting concrete plans—especially with timing and method— increases follow-through (Gollwitzer, 1999; Rogers et al., 2015; Abel et al., 2019; Nickerson and Rogers, 2010; Milkman et al., 2011; Atkinson et al., 2013; Altmann et al., 2022; Gallegos et al., 2023).

reminders may be particularly effective for those who exhibit such awareness, but we do not find any evidence of heterogeneous treatment effects along this dimension.

As with any reminder-based intervention, several concerns arise regarding its broader implications. One important question is whether reminders help individuals move closer to their optimal savings level or push them to save at suboptimally high rates. We find that in our setting participants save substantially less than they believe would be ideal, and over 92 percent of participants agree, prior to treatment, that they should be saving more than the intervention encourages. Another key concern is whether reminders truly increase overall savings or merely shift the timing of deposits. By examining savings beyond the intervention period, we rule out the possibility that the intervention simply redistributes savings over time. Instead, we find that personalized reminders lead to a net increase in total savings in the year of the intervention by 16 percent (33 thousand COP) relative to *Control*.

This study contributes to a broad literature on the efficacy of reminders across various domains, including savings (Karlan et al., 2016; Kast et al., 2018; Rodríguez and Saavedra, 2019; Aker et al., 2020; Azevedo et al., 2024), compliance with health appointments and medication adherence (Haberer et al., 2016; Bobrow et al., 2016; Pop-Eleches et al., 2011; Barron et al., 2022), vaccination (Kharbanda et al., 2011; Patel et al., 2023; Milkman et al., 2024), gym attendance (Calzolari and Nardotto, 2017), rule compliance (Apesteguia et al., 2013), and loan repayment (Karlan et al., 2015; Cadena and Schoar, 2011). While prior research has established the effectiveness of reminders, this study focuses on a key, but often overlooked, aspect: the timing of reminders. A few papers indicate that the timing of reminders matters for behavioral change (Gillitzer and Sinning, 2020; Goette and Tripodi, 2020). To the best of our knowledge ours is the first paper to hone in on how reminders that tailor the timing to individual preferences promote behavioral change.

We also contribute to the literature on goal setting, mental accounting and soft commitments (e.g. Choi et al., 2009; Bryan et al., 2010; Nickerson and Rogers, 2010; Milkman et al., 2011; Stutzer et al., 2011; Mogollon et al., 2021; Altmann et al., 2022; Karlan and Linden, 2025). Our findings show that plan-making has modest effects in the context of retirement savings. Previous research has demonstrated the benefits of planning in various decision-making settings (e.g. Nickerson and Rogers, 2010; Milkman et al., 2011), and this study

highlights its potential as a tool to encourage long-term financial behavior in combination with tailored reminders.

2. Experimental Setting

Workers in informal or unstable jobs often lack access to employer-sponsored retirement plans, requiring them to make active decisions about saving for retirement. However, these decisions may be hindered by forgetfulness and inattention. To examine the role of such attention constraints in retirement savings, we collaborate with Colombia's public pension fund Colpensiones. Colombia is one of the Latin American countries with the highest rates of labor market informality (OECD/OISS, 2024), making it an ideal setting for this study.

2.1. BEPS

The *Beneficios Económicos Periódicos* (BEPS) is a program introduced by Colpensiones in 2015 that provides life annuities to individuals who are excluded from the mandatory pension system due to informal or unstable employment or low income. BEPS operates as a voluntary savings scheme, allowing participants to contribute at their own pace, with deposits ranging from a minimum of 5,000 Colombian Pesos (COP) to a maximum of 1,620,000 COP per year (savings limits for 2023).

At retirement age—57 for women and 62 for men—participants can choose to receive bimonthly annuities. The annuity amount is determined by their total nominal contributions, investment returns (which are guaranteed to grow at least at the rate of inflation), and a 20 percent government subsidy applied to their accumulated savings (Villa-Lora and Benítez-Duarte, 2023). Alternatively, participants may opt to delay their payouts or withdraw their nominal contributions as a lump sum.

As a hybrid social security scheme, BEPS also provides access to free basic life and disability insurance. To qualify, account holders must either make at least six deposits per year or save the target minimum yearly amount, which is set at the equivalent of six days of a legal monthly minimum salary (200,000 COP in 2022 and 181,705 COP in 2021). This insurance covers physical disability, chronic illness, life insurance, and funeral expenses,

with an average claims payout of 4.5 million COP in 2022.[2]

To further incentivize saving, BEPS offers participants the chance to win prizes through annual lotteries. In 2022, for every 20,000 COP saved within the year, savers receive one lottery ticket. Nine lotteries were held, with a total prize pool of 132 million COP. The draw takes place in January of the following year.

Participants have complete flexibility in deciding how often and how much to save, with no direct penalties for irregular saving. However, this flexibility presents a challenge: many enrollees do not save consistently. While approximately 1.6 million people (around 3 percent of the Colombian population) were enrolled in BEPS as of 2021, fewer than 20 percent contributed enough to qualify for life and disability insurance (Colpensiones, 2021).

2.2. Intervention

To study the attention constraints that hinder regular retirement saving, we collaborate with Colpensiones to conduct a survey experiment among BEPS users. This allows us to gather baseline information essential for designing a targeted intervention. The core intervention consists of personalized monthly reminders over four months, scheduled according to a saving plan elicited from each user. Figure 1 provides an overview of the study design.

In January 2022, we conducted a survey to recruit a sample of BEPS users who expressed an active interest in saving for retirement. Recruitment was carried out via an SMS sent directly from Colpensiones' official contact number, which included a link to a survey hosted on Colpensiones' official website.[3] The link contained an encrypted unique identifier, enabling us to match each BEPS user to their survey response.

Within the survey, subjects were assigned to one of three treatment groups—*Plan only*, *Personalized reminders (F)*, and *Personalized reminders (C)*—or to a *Control* group. In all three treatments, the survey elicited a savings plan, encouraging participants to create a personalized plan in our provided calendar by selecting one specific day for saving in each of the

[2]Although this insurance product is not widely available to retail customers, the yearly premium paid by Colpensiones was priced at approximately 16,000 COP in 2022.

[3]Using the official number from which Colpensiones regularly contacts BEPS users has the major advantage of minimizing concerns that the invitation might be perceived as fraudulent.

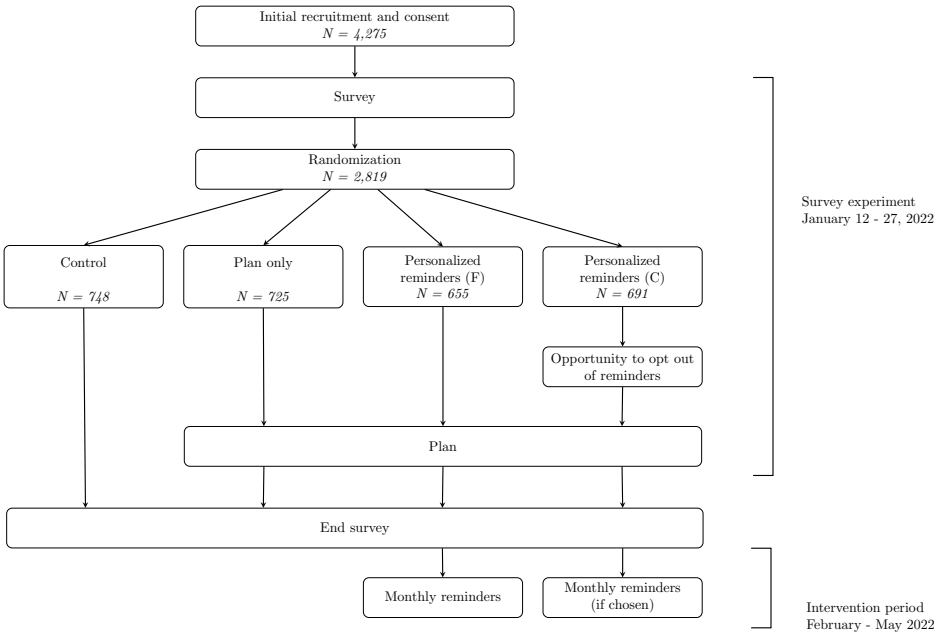

Figure 1: Flow of Study Design

upcoming four months, from February to May.[4]

All participants in the study had been receiving (and continue to receive) biweekly reminders, independent of the intervention and common to all BEPS users. Prior to eliciting their savings plans in the survey, all subjects in *Plan only*, *Personalized reminders (F)*, and *Personalized reminders (C)* were informed that the plan they provided would be used for reminder personalization. However, only participants in the personalized reminders treatments ultimately received an additional monthly reminder beyond the standard communications from the pension fund.

In the *Plan only* treatment, after submitting their personal savings plan, subjects received a confirmation on the next screen reinforcing their (soft) commitment to save according to their personal plan: "On the following dates ... you committed to saving in BEPS".

In the *Personalized reminders (F)* treatment, after submitting their personal savings plan, subjects received confirmation of their plan along with an explanation that they would re-

[4]To avoid dropouts due to browser compatibility issues, participants were not forced to provide a complete four-date plan. However, the share of subjects submitting a complete plan does not differ across treatments (F-test $p = 0.171$). For analyses requiring a complete plan, where indicated, we restrict the sample to the 73 percent of subjects who submitted a full plan.

ceive free monthly SMS reminders on their selected dates: "On the following dates ... you will receive text message reminders about your commitment to saving in BEPS." In this treatment, all participants were forced to receive these monthly reminders.

In the *Personalized reminders (C)* treatment, before submitting their personal savings plan, subjects were asked whether they would like to receive personalized reminders based on the plan they were about to formulate. If they declined the reminder service, their final screen confirmation resembled that of the *Plan only* treatment. If they accepted, it resembled the *Personalized reminders (F)* treatment.

When participants receive the reminder, the message incorporates references to their personalized plan along with standard language used by Colpensiones in its recurring messaging campaigns.[5]

2.3. Data

The survey collected information on subjects' monthly BEPS savings, income frequency, and whether they believed it would be in their interest to save more than 10, 20, 30, 40, or 50 thousand COP per month. Additionally, it asked whether they agreed that failing to save at least five thousand COP a month was primarily due to forgetting. Furthermore, the survey provided all participants with information on the savings requirements for 2022 to qualify for free life and disability insurance the following year, which was important in order to hold constant the informational content of the study with respect to the only incentive to save that (i) non-linearly depends on saving behavior and that (ii) will be referenced in the reminders that some of the study participants receive.

We link responses from the survey experiment to transaction-level data and demographic information from Colpensiones' administrative records between January 1, 2021, and December 31, 2022. These data allow us to construct the following main measures of saving behavior both before and during the intervention.

Savings in the year prior We construct three main measures using 2021 data, which will be used to evaluate sample balance across treatments and as control variables in regression

[5]The translation of the exact wording reads as follows: "{$Name}, today {$Date} you planned to save in Colpensiones BEPS. Doing so helps towards the goal of earning BEPS life insurance. Inf 018000410777."

analyses. The first measure, *Deposits in 2021*, captures the total number of BEPS deposits linked to an account holder. The second measure, *Savings in 2021*, represents an individual's total yearly contributions to BEPS, calculated as the sum of all deposit values (in thousands of COP) associated with their account. To manage extreme values of both these measures, positive values are winsorized at the ninety-eighth percentile. The third measure, *Qualified in 2021 for insurance*, is an indicator of whether an account holder's 2021 savings qualified them to receive free life and disability insurance in 2022. To qualify, an individual must meet one of two criteria within the 2021 calendar year: (i) make at least six deposits above five thousand COP, or (ii) save a total of at least 181,705 COP.

Savings in the study period These four main outcomes are based on data from February 2022 to May 2022 and include *Plan adherence*, which counts the number of times a subject saves within five days of the monthly date indicated in the surveyed plan (ranging from 0 to 4);[6] the number of deposits (*Deposits*); the average value of deposits made (*Average deposit*); and the total amount saved (*Savings*). The latter two are expressed in thousands of COP. To account for extreme values, positive values of the first three outcomes are winsorized at the ninety-eighth percentile.

2.4. Sample

We recruited, in winter 2022, an initial sample of 4,275 subjects who opened the survey between January 12 and January 27 and provided consent to be included in the study. Some of these subjects dropped out before treatment assignment. As Appendix Table A.1 shows, the rate of survey completion is very similar across treatments, but somewhat higher in the control group (this difference is likely due to differential survey length). In Table 1, e show that the randomized sample across four groups is well balanced, justifying analyses that are based on an intention-to-treat design for subjects who get past the randomization screen of the survey. For estimations of average treatment effects on the treated, we are restricted to the sample of the three treatment groups that show no differential attrition.

[6] Appendix Figure A.2 illustrates when subjects save relative to their planned date: most differences across treatments occur on the reminder date, suggesting that reminders effectively influence saving behavior. This pattern confirms the organization's compliance with the savings plan's reminder schedule.

Table 1: Balance on Demographics, Survey Responses, and Past Savings

	(1) Control	(2) Plan Only	(3) Personalized Reminders (F)	(4) Personalized Reminders (C)	(5) p-value
Age	46.779	45.988	46.018	45.936	0.241
	(0.337)	(0.341)	(0.363)	(0.342)	
Woman	0.729	0.734	0.690	0.712	0.270
	(0.016)	(0.016)	(0.018)	(0.017)	
Account Years	3.454	3.538	3.487	3.491	0.841
	(0.063)	(0.067)	(0.070)	(0.069)	
Rural	0.172	0.196	0.173	0.182	0.621
	(0.014)	(0.015)	(0.015)	(0.015)	
Savings Goal $\geq$ 10k	0.925	0.937	0.919	0.932	0.608
	(0.010)	(0.009)	(0.011)	(0.010)	
Salary Paid Monthly	0.611	0.581	0.623	0.609	0.418
	(0.018)	(0.018)	(0.019)	(0.019)	
Forgetfulness Recognition	0.441	0.463	0.411	0.460	0.186
	(0.018)	(0.019)	(0.019)	(0.019)	
Deposits in 2021	6.325	6.410	6.214	6.706	0.549
	(0.239)	(0.255)	(0.246)	(0.250)	
Savings in 2021	205.914	195.043	193.327	210.684	0.702
	(11.782)	(11.818)	(12.507)	(12.459)	
Qualified in 2021 for Insurance	0.507	0.510	0.508	0.554	0.221
	(0.018)	(0.019)	(0.020)	(0.019)	
Observations	748	725	655	691	2819

Notes: This table reports baseline characteristics of the randomized sample by treatment group. Column (5) reports the p-value from an F-test for joint significance across all treatment groups for each row variable. "Account Years" captures the number of years a BEPS account has been registered for. "Salary Paid Monthly" is a binary variable and takes value 1 if the participant gets their salary paid on a monthly basis, and 0 otherwise. The variable "Forgetfulness Recognition" captures whether a participant responded "Totally agree" or "Agree" to a survey question about the extent to which they agree that failing to save at least five thousand COP a month was primarily due to forgetting. Savings and deposits for different years are reported in thousands of COP. Standard errors in parentheses.

3. Results

3.1. Savings Goals

We start with a set of descriptive results that set the stage for the causal evidence that will follow. We provide several pieces of evidence indicating that BEPS users indeed save too little for retirement and that some of the inefficiencies arise due to attention constraints.

Intentions vs. actions While savings goals may vary markedly over time for various reasons, it is informative to contrast actual past savings with the participants' savings goals. Panel A of Figure 2 shows that the vast majority of respondents view saving into BEPS as being in their own economic interest. 40 percent state that they should aim to save at least fifty thousand COP per month, and nearly all respondents (92 percent) believe that saving

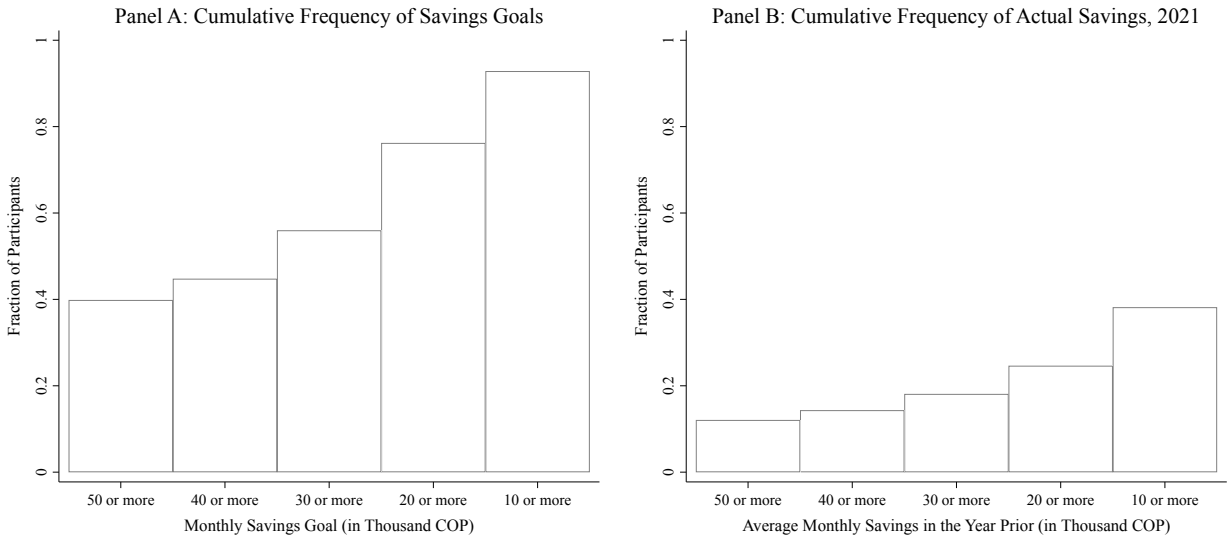

Figure 2: Savings goals and actual savings

Notes: This figure depicts cumulative frequencies at different savings thresholds for all participants. Panel A reports savings goals that subjects state in our survey, Panel B reports actual average savings in the year prior to our survey in COP. Not all participants were registered for all 12 months of 2021, so the average savings are obtained based on the individual number of months a participant was registered.

at least ten thousand COP per month would be beneficial. In Panel B, using administrative records of BEPS transactions in the year prior to the intervention, we observe that most participants fall short of their own savings goals, with only 38 percent of them managing to save more than ten thousand COP per month in 2021.

Forgetfulness recognition Recognition of forgetfulness is negatively correlated with deposits in 2021 ($corr = -0.187$, $p < 0.001$) as well as savings in 2021 ($corr = -0.194$, $p < 0.001$) in the previous year. That is to say that people who saved less in the year prior to the intervention are people who recognize being forgetful about their retirement savings. In Appendix Figure A.1, we contrast the negative trend that emerges when plotting the likelihood of saving an average of at least ten thousand COP per month in the previous year against forgetfulness recognition (Panel A) to the substantially uniform savings goals that we observe at different levels of forgetfulness recognition (Panel B; Kolmogorov-Smirnov, $p = 0.174$). This combined evidence supports the interpretation that an important driver of voluntary saving is inattention rather than *intention* – which we will test experimentally.

3.2. Plans and the Effects of Personalized Reminders on Savings

One of our main outcomes, given the design of the study, is plan adherence. We can inspect this closely by focusing on the 73 percent of subjects (balanced across treatments) for whom we have a complete four-dates saving plan, and we ask to what extent they fulfilled their plan. In Panel A of Figure 3, we see that these participants display a somewhat weak adherence to their own plan: only 38 percent adhere to at least one of the saving dates and 3 percent to all four. Panel B estimates the pooled average treatment effect on the treated participants over the study period, demonstrating that reminders increase plan adherence by 40 percent relative to a baseline of 0.534 adherence in the plan treatment. Giving a choice of whether to receive the reminder does not change the effectiveness of reminders in terms of adherence. This might be a consequence of the large share (89 percent) of participants in *Personalized reminders (C)* who choose to receive the reminders. Given the stark similarity in adherence across the personalized reminder treatments and the overwhelming level of subscription to this free service, we will pool these two treatments for analyses presented in the remainder of this section.[7]

We estimate the broader effects of the intervention in an intent-to-treat framework using the following ANCOVA specification:

$$Y_i = \alpha + \beta_1 Plan\ only_i + \beta_2 Personalized\ reminders_i + \mathbf{X}\gamma + \varepsilon_i \quad (1)$$

where Y_i denotes the individual outcome of interest, $\mathbf{X}$ is a vector of control variables that includes winsorized total savings in the year prior to the intervention (2021), the number of deposits in 2021, whether the participant saved enough in 2021 to obtain free life and disability insurance the following year, gender, age group, and an indicator for whether the participant lives in a rural area. ε_i are robust standard errors.

In Table 2 we estimate this model for three main outcomes. In column (1), we look at how inviting participants to form a savings plan may affect the number of deposits that they make during the study period. We find that they increase deposits by 0.19, an effect that is marginally significant (t-test, $p = 0.059$). These findings are useful also to contextualize the

[7] In Appendix Table A.4 we reproduce all main analyses separately for the two treatments and show that results are indeed qualitatively very similar.

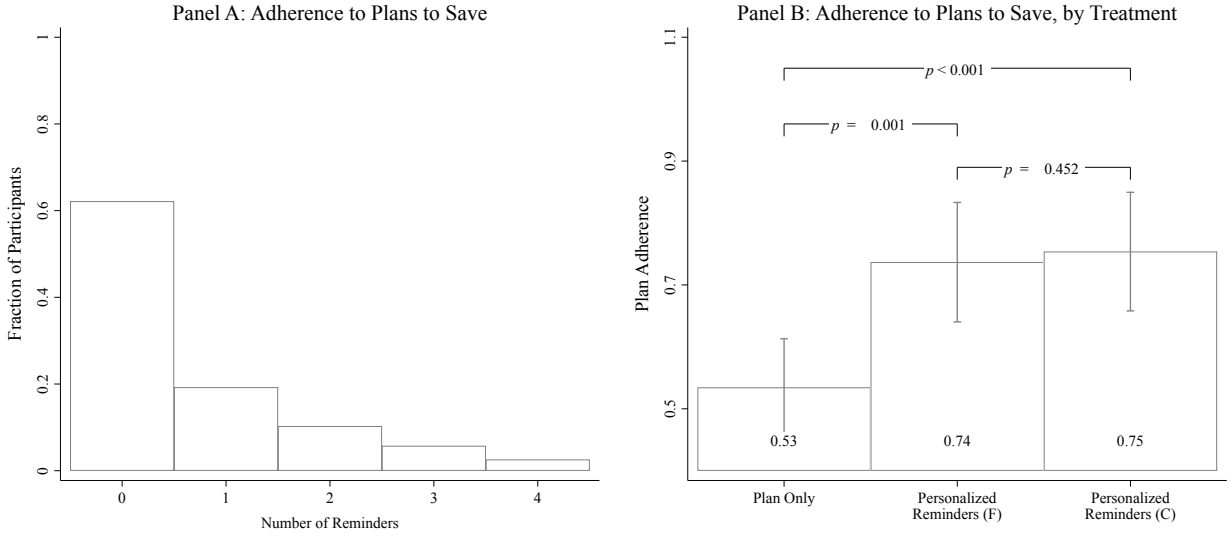

Figure 3: Plan adherence

Notes: This analysis restricts the sample to the 73 percent of participants who provide a complete four-date plan in *Plan only*, *Personalized reminders (F)*, and *Personalized reminders (C)*. Panel A presents a histogram of the extent to which participants adhere to the four-date plan. Panel B presents average adherence to the plans to save by treatment group with 95 percent confidence intervals. The outcome variable in Panel B is the number of dates adhered, ranging from 0 to 4.

rate of plan adherence reported in Figure 3: adherence to plans in the *Plan only* treatment suggests that respondents paid attention when formulating the dates of their savings plans, and that these meaningfully align with the timing of their own financial flows.

In comparison, the personalized reminder treatments are almost twice as effective at increasing the number of deposits, with differences in the number of deposits being significant both relative to *Control* (t-test, $p < 0.001$) as well as to *Plan only* (t-test, $p = 0.099$). Importantly, we report in column (2) that such an increased number of deposits is not offset by a reduction in the average amount deposited (F-test, $p = 0.358$). As a result, the intervention results in an overall increase in savings by 11 thousand COP over the four-months study period (column 3), an amount that, while being somewhat small in absolute terms, represents a 17 percent increase relative to the control mean.

While personalized reminders show promising potential, a common concern with similar interventions is the possibility of harvesting, where increased savings during the intervention period might be followed by a drop afterward. In Appendix Table A.2, we address this concern by analyzing savings data for the remainder of the calendar year. Contrary to the harvesting hypothesis, we find the opposite effect: the increased savings in the personalized reminder treatments persist throughout the year. As a result, participants in

Table 2: Intention-to-Treat Effects on Voluntary Savings

	(1) Deposits	(2) Average Deposit	(3) Savings
Plan Only	0.19*	-0.89	5.06
	(0.098)	(1.50)	(3.60)
Personalized Reminders	0.33***	0.26	11.3***
	(0.086)	(1.33)	(3.23)
Observations	2819	1678	2819
Adjusted R^2	0.474	0.673	0.631
Control Mean	1.88	36.6	64.8
Past Savings Controls	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes
Personalized Reminders - Plan Only = 0			
↪ p-value	0.099	0.358	0.066
Personalized Reminders = Plan Only = Control			
↪ p-value	0.000	0.652	0.002

Notes: This table reports the ITT effects of the intervention on different outcomes. Past savings controls include total savings in 2021, number of deposits in 2021, as well as an indicator for qualifying for insurance in 2021. Savings in 2021 and the number of deposits in 2021 were winsorized at the ninety-eighth percentile. Demographic controls include an indicator for being female, an indicator for living in a rural area, and the age group. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

these treatments save an additional 33 thousand COP compared to the *Control* group (t-test, $p < 0.001$) in 2022. This sustained impact may be explained by a stepping-stone effect, where the intervention helps individuals reach their savings targets earlier in the year, making them eligible for the highly salient benefit of free life and disability insurance for the following year. Consistent with this mechanism, we find that personalized reminders increase the share of individuals qualifying for life and disability insurance by 4 percentage points (t-test, $p = 0.029$).

3.3. The Demand for Personalized Reminders

One important advantage of our design is that it allows us to make a first step toward understanding the optimal demand for retirement savings reminders. We can do so by investigating what the predictors of demand in the *Personalized reminders (C)* treatment are.

Table 3 shows that demand for reminders is strongly predicted by whether individuals believe that forgetting to save is a key reason for not meeting their personal savings goals. We also find a weaker but significant correlation with receiving a monthly salary rather than a biweekly, weekly, or daily wage. Conversely, demand is negatively correlated with past saving behavior, including total savings in 2021 and whether the participant saved

Table 3: Determinants of Demand for Reminders

	(1)	(2)	(3)	(4)	(5)	(6)
Forgetfulness Recognition	0.12***					0.11***
	(0.023)					(0.023)
Savings Goal between 0 and 10k COP		-0.12*				-0.12*
		(0.064)				(0.061)
Salary Paid Monthly			0.047*			0.044*
			(0.026)			(0.025)
Savings (2021)				-0.00013***		-0.000068
				(0.000047)		(0.000056)
Qualify for Insurance (2021)					-0.093***	-0.047*
					(0.023)	(0.028)
Observations	670	670	670	670	670	670
Adjusted R^2	0.036	0.008	0.004	0.018	0.020	0.061

Notes: Columns (1) to (5) report the results of regressing demand on each of the row variables. Column (6) reports the results of regressing demand on all of the row variables in the same specification. The variable "Forgetfulness Recognition" captures whether a participant responded "Totally agree" or "Agree" to a survey question about the extent to which they agree that failing to save at least five thousand COP a month was primarily due to forgetting. The estimation sample includes 670 (of the 691 people assigned to the treatment) who successfully completed the survey. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

enough that year to qualify for free life and disability insurance in the following year. This suggests that individuals with well-established saving habits may view the reminders as redundant—or even a nuisance.

While recognition of forgetfulness predicts a demand for reminders, we interestingly do not find that reminders are more effective for individuals who report such recognition (see columns 1–3 of Appendix Table A.3). This somewhat puzzling result may have several explanations related to individuals' ability to shape their environment and allocate their attention optimally. One possibility is that people who recognize their own forgetfulness are more likely to set personal reminders, which could attenuate the heterogeneous treatment effects we are able to estimate. However, if this were the case, we would expect these individuals to benefit disproportionately from the *Plan only* treatment—a pattern we do not observe (see columns 4–6 of Appendix Table A.3).

Another possible explanation relates to the miscalibration of subjective beliefs about future states. Individuals may misjudge their future inattention or the effectiveness of this reminder technology, potentially in ways that are correlated with forgetfulness recognition, leading to a disconnect between reminder demand and actual benefits. If so, those who seek reminders may not systematically benefit more from them. Identifying these potential sources of miscalibration remains an interesting and largely unexplored avenue for future research.

4. Conclusions

In this paper, we show that personalized reminders significantly increase both the frequency and amount of voluntary retirement savings among BEPS users in Colombia. While planning alone has limited effects on savings behavior, reminders that align with individuals' self-identified optimal timing substantially improve adherence.

Beyond assessing the efficacy of reminders, our findings contribute to broader discussions on the role of behavioral interventions in encouraging savings. They emphasize the importance of tailoring interventions to individual preferences in timing. The study also raises some questions about potential miscalibration of subjective beliefs regarding future inattention and what role nudges may play in addressing them. Future research could explore how individuals form and act on these beliefs when managing their attention, particularly in settings where voluntary financial behaviors require sustained engagement.

More broadly, our results underscore the potential for light-touch, cost-effective interventions to enhance retirement security for informal workers, a challenge of ongoing global relevance. However, an important limitation of our study is that participants—who voluntarily engaged in a pension fund experiment—may be more motivated to improve their savings habits than the general population of informal workers. We see this research as a first step toward understanding how timing personalization of reminders can be scaled to benefit workers—especially those without employer-sponsored retirement plans, for whom limited attention is likely to be a substantial barrier to optimal retirement saving.

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A. Additional Tables and Figures

Table A.1: Attrition

	(1)	(2)
Plan Only	-0.10***	
	(0.011)	
Personalized Reminders (F)	-0.13***	-0.023
	(0.013)	(0.017)
Personalized Reminders (C)	-0.090***	0.015
	(0.011)	(0.016)
Observations	2819	2071
R^2	0.033	0.003
Control Mean	1	1

Notes: This table presents a linear probability model in which the outcome is the probability of completing the survey. The estimation sample includes every participant that has reached the treatment stage of the survey. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A.2: Intention-to-Treat Effects on Yearly Voluntary Savings in the Year of the Intervention

	(1) Savings in 2022	(2) Qualified in 2022 for Insurance
Plan Only	9.99	-0.0077
	(9.39)	(0.021)
Personalized Reminders	33.3***	0.041**
	(8.40)	(0.019)
Observations	2819	2819
Adjusted R^2	0.711	0.308
Control Mean	207.7	0.59
Past Savings Controls	Yes	Yes
Demographic Controls	Yes	Yes
Personalized Reminders - Plan Only = 0		
$\hookrightarrow$ p-value	0.006	0.008
Personalized Reminders = Plan Only = Control		
$\hookrightarrow$ p-value	0.000	0.013

Notes: This table reports the ITT effects of the intervention on different outcomes. The outcome in column (1) is savings in 2022, which includes savings outside of the intervention period of February to May 2022. The outcome in column (2) is an indicator for whether or not a participant qualified for insurance in 2022. Past savings controls include total savings in 2021, number of deposits in 2021, as well as an indicator for qualifying for insurance in 2021. Savings in 2021 and the number of deposits in 2021 were winsorized at the ninety-eighth percentile. Demographic controls include an indicator for being female, an indicator for living in a rural area, and the age group. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A.3: Heterogeneity

	(1) Deposits	(2) Savings	(3) Qualified in 2022 for Insurance	(4) Deposits	(5) Savings	(6) Qualified in 2022 for Insurance
Personalized Reminders	0.32***	14.7***	0.046*			
	(0.12)	(4.65)	(0.024)			
Personalized Reminders × Forgetfulness Recognition	0.040	-7.72	-0.012			
	(0.17)	(6.27)	(0.038)			
Forgetfulness Recognition	-0.20	2.08	-0.033	-0.21	1.33	-0.021
	(0.13)	(4.75)	(0.032)	(0.13)	(4.72)	(0.032)
Plan Only				0.21	6.41	-0.0070
				(0.13)	(5.28)	(0.027)
Plan Only × Forgetfulness Recognition				-0.033	-3.11	-0.0011
				(0.20)	(7.09)	(0.043)
Observations	2094	2094	2094	1473	1473	1473
Adjusted R^2	0.464	0.631	0.290	0.493	0.646	0.325
Control Mean	1.88	64.8	0.59	1.88	64.8	0.59
Past Savings Controls	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table presents heterogeneous intention-to-treat effects of different treatment assignments and their interaction with the forgetfulness indicator on different outcomes. Past savings controls include total savings in 2021, number of deposits in 2021, as well as an indicator for qualifying for insurance in 2021. Savings in 2021 and the number of deposits in 2021 were winsorized at the ninety-eighth percentile. Demographic controls include an indicator for being female, an indicator for living in a rural area, and the age group. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A.4: Intention-to-Treat Effects: Personalized Reminders Treatments

	(1) Deposits	(2) Average Deposit	(3) Savings	(4) Savings in 2022	(5) Qualified in 2022 for Insurance
Plan Only	0.19*	-0.89	5.06	9.99	-0.0077
	(0.098)	(1.50)	(3.60)	(9.39)	(0.021)
Personalized Reminders (F)	0.29***	1.91	14.4***	34.1***	0.041*
	(0.099)	(1.56)	(3.84)	(9.97)	(0.022)
Personalized Reminders (C)	0.38***	-1.26	8.34**	32.5***	0.042*
	(0.10)	(1.49)	(3.85)	(9.81)	(0.022)
Observations	2819	1678	2819	2819	2819
Adjusted R^2	0.474	0.674	0.631	0.711	0.308
Control Mean	1.88	36.6	64.8	207.7	0.59
Past Savings Controls	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes
Personalized Reminders (F) - Plan Only = 0					
↪ p-value	0.332	0.061	0.019	0.016	0.025
Personalized Reminders (F) - Personalized Reminders (C) = 0					
↪ p-value	0.364	0.032	0.149	0.880	0.972
Personalized Reminders (F) = Personalized Reminders (C) = Control					
↪ p-value	0.000	0.099	0.001	0.000	0.093

Notes: This table reports the ITT effects of different treatment assignments, with disaggregated effects of the pooled Personalized Reminders treatments, on different outcomes. Past savings controls include total savings in 2021, number of deposits in 2021, as well as an indicator for qualifying for insurance in 2021. Savings in 2021 and the number of deposits in 2021 were winsorized at the ninety-eighth percentile. Demographic controls include an indicator for being female, an indicator for living in a rural area, and the age group. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

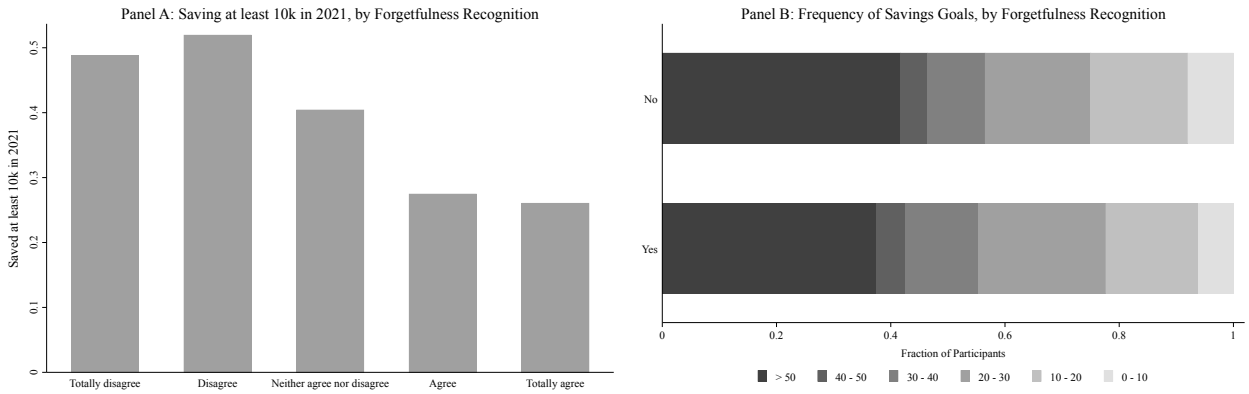

Figure A.1: Savings and Forgetfulness Recognition

Notes: This figure reports the relationship between self-reported forgetting to save and different savings outcomes. Panel A reports the fraction of people who saved at least 10 thousand COP in 2021 by their recognition of forgetfulness. The variable "Forgetfulness Recognition" captures whether a participant responded "Totally agree" or "Agree" to a survey question about the extent to which they agree that failing to save at least five thousand COP a month was primarily due to forgetting. A Kolmogorov-Smirnov test reveals no significant statistical difference in savings goals between participants who report that they forget to save and those that do not ($p = 0.174$). All values are reported in thousand COP.

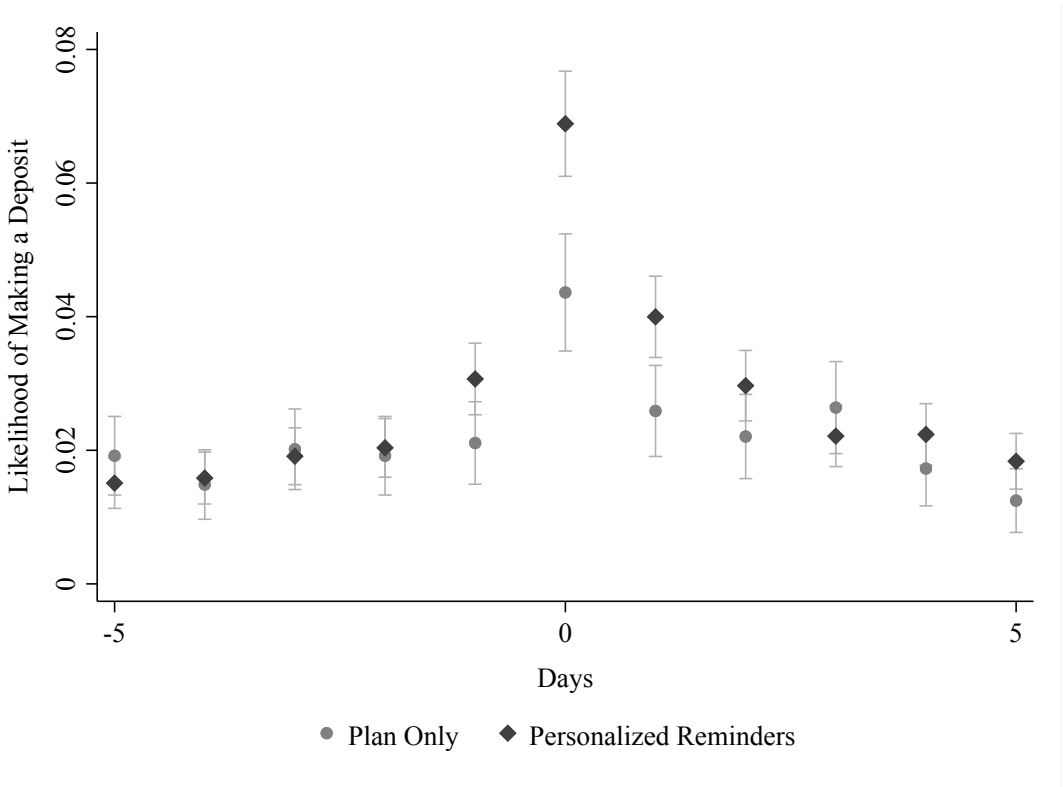

Figure A.2: Likelihood of Making a Deposit by Treatment Assignment

Notes: This figure depicts the probability of making a deposit on each day within the interval of 5 days before and 5 days after receiving the reminder by treatment assignment. Capped ranges represent 95 percent confidence intervals.