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Research Article

Pension Policy Literacy and Retirement Expectations: A Cross-Country Survey Experiment

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Abstract

Objectives: This study reports the findings of the first cross-national survey experiment on the effects of information on the expected retirement age. Given the drawbacks of unrealistic retirement expectations, the study examines the impacts of nonpartisan information about future demographic aging and forecasted pension benefit levels.

Methods: An online survey experiment was conducted in the United States, Germany, and Spain in 2018 using an internet access panel. We assigned respondents to 2 random treatments: one citing the change in the projected share of the population older than 65 years (demographic treatment) and another citing the projected change in pension replacement rates (benefits treatment), both for 2015–2040. Treatment effects on the expected retirement age are reported.

Results: The benefits treatment has a strong influence on retirement expectations. In the United States, respondents informed of the expected decline in pension replacement rates expect to retire 2 years later than respondents not informed of the decline. In Spain, this treatment leads to an approximately 9-month postponement of expected retirement, while no significant effect is found in Germany. In addition, the demographic treatment does not affect retirement expectations in the countries studied. Respondents in all countries informed of future population aging do not show different expected retirement ages than respondents not given this information.

Discussion: People's retirement expectations are sensitive to information on future changes in pension generosity but not to information on population aging. The results suggest information campaigns focused on declining pension replacement rates may help extend working lives.

Keywords: Information effects, International comparison, Pension benefits, Population aging, Retirement planning

Since the early 1990s, governments have reacted to population aging and macroeconomic pressures by launching far-reaching reforms aimed at ensuring the financial sustainability of social policy programs (Ebbinghaus & Naumann, 2017). Beyond reducing future pension entitlements, reforms have increased incentives for extending working lives as baby boomers were approaching retirement (Mermin et al., 2007). Indeed, working-age citizens in most countries now assume that they will retire later than previous generations (Hess, 2017; Pew Research Center, 2010). Nevertheless, retirement expectations may not have adapted fast enough, and many workers may still expect to retire unrealistically early, in part because they overestimate the benefits they will receive. Such unmet expectations may have undesirable consequences. Workers may begin to disengage from work prematurely and lose human capital (Damman et al., 2013) or accumulate insufficient savings to sustain their material well-being during retirement. How workers adapt to changing retirement policies is not properly understood and remains one of

the most pressing issues on the research agenda (Henkens et al., 2018).

In general, retirement expectations are strongly predictive of actual retirement ages (Abrams et al., 2020; Bernheim, 1987; Ho & Raymo, 2009). However, today's senior workers have less confidence in their economic security during old age than the previous generation and increasingly question conventional norms regarding retirement timing (de Grip et al., 2013; Olivera & Ponomarenko, 2017; Radl 2012). By virtue of their declining stickiness, retirement expectations have become sensitive to contextual conditions (Szinovacz et al., 2014). Growing uncertainty increases the potential influence of nonpartisan, reliable information on the formation of retirement expectations. In particular, projections on future demographic structures and expected public pension benefits could provide some cognitive anchoring. Workers may be susceptible to relevant information, especially because many are ill-informed about pensions (Boeri et al., 2001; Ekerdt & Hackney, 2002). However, previous research has not found consistent effects of pension-related information on retirement expectations (Finseraas & Jakobsson, 2014; Mastrobuoni, 2011). In view of current population trends and the ongoing increase in pensionable ages, there is a particular need for robust, current evidence concerning the impact of pension literacy on expected retirement timing.

This is the first study to assess the impact of individuals' knowledge on retirement expectations from a comparative perspective. Unlike previous research that has solely considered the role of future pension levels in a single country (Finseraas & Jakobsson, 2014; Mastrobuoni, 2011), our study considers the influence of both future pension levels and demographic trends in three affluent democracies. We specifically examine the influence of two types of information: (a) *demographic information*, that is, the forecasted old-age dependency ratio of a country, and (b) *benefits information*, that is, future projections on the expected generosity of pension benefits.

The experiment was implemented using harmonized surveys conducted in three affluent democracies with aging populations—Germany, Spain, and the United States—where information effects have never been examined conjointly. A comparison of these three cases is enlightening because despite their substantial similarities in important aspects—they are all affluent democracies with Bismarckian pension systems—they vary in terms of expected reductions in public pension levels, forecasted increases in population aging, economic conditions, and current institutional incentives to defer retirement. These differences could induce cross-national variations in the treatment effects.

State of Research

Retirement Expectations and Planning

Previous work shows that the expected retirement age strongly predicts actual retirement timing (Bernheim, 1987). According to a recent analysis, most older Americans ultimately fulfill their initial retirement expectations (Abrams et al., 2020). As Ho and Raymo (2009, p. 157) summarize, "studies examining congruence between expectations and subsequent behavior have found that expected retirement timing is frequently consistent with actual timing observed in subsequent survey waves." Nevertheless, available research points to frequent within-person fluctuations, particularly among women (Wong & Hardy, 2009). There are also accounts of inconsistencies between expected and realized retirement ages. A Finnish study reports that people on average retired later than they had anticipated (Ilmakunnas & Ilmakunnas, 2018). For the United States, conversely, the chances of unexpectedly not working at age 62 were found to be much greater—mostly due to health issues—than the chances of unexpectedly still working at age 62 (Abrams et al., 2020). Macrolevel conditions such as economic recessions or policy shifts may also be responsible for such mismatches (Abrams et al., 2020; Mermin et al., 2007; Szinovacz et al., 2014).

Previous studies have also examined the sociodemographic determinants of retirement expectations. Older, more educated, and wealthier workers expect to retire later than mid-career workers, people with less formal education, or individuals with lower incomes (de Grip et al., 2013; Pew Research Center, 2010). Moreover, men expect to retire later on average than women (Pienta & Hayward, 2002), and spouses frequently expect to retire jointly (Ho & Raymo, 2009; Whitaker & Bokemeier, 2018). Health limitations and shorter self-perceived life expectancies are also associated with earlier expected retirement (Szinovacz et al., 2014; Whitaker & Bokemeier, 2018). In short, the individual-level predictors of retirement expectations correspond to the well-documented correlates of actual retirement behavior.

These same predictors have been reported to affect retirement planning more broadly (Moen et al., 2005). Furthermore, most workers engage in limited retirement planning (Wang & Shultz, 2010), especially in European countries, where people are more accustomed to trusting the state to ensure old-age income security (Hershey et al., 2010).

Pension Policy Literacy

Numerous studies demonstrate that levels of financial literacy are generally low (Alessie et al., 2011; Fernandes et al., 2014; Hastings et al., 2013). Moreover, it has been shown that people are generally ill-informed of even basic parameters of public pension provision. Only 27% of Americans estimating their expected social security pension benefits were able to come within 25% of the true value (Gustman & Steinmeier, 2005). Similarly, Gustman et al. (2008) show that 38% of all contributors did not know whether they had a defined benefit or defined contribution plan.

Regarding European countries, Boeri, Börsch-Supan, and Tabellini show that only a minority are actually aware

that public pension programs in their country operate on a pay-as-you-go basis or know the share of their gross monthly wage assigned to social security (Boeri et al., 2001). Since the paradigmatic pension reform in Sweden passed in the 1990s, the government has tried to promote public awareness. However, after more than a decade of institutional campaigns, only 40% of the contributors know that benefits are calculated based on lifetime earnings in the new system (Sundén, 2008).

Prior research has therefore shed important light on the sociodemographic determinants of retirement expectations and retirement planning. However, there is still no evidence regarding how individual knowledge on demographic and pension policy trends affects people's retirement plans. In the context of shifting pension generosity, this knowledge gap may leave many citizens to make consequential choices based on faulty assumptions. To fill this research deficit, the following section formulates hypotheses about the influence of knowledge about these macro conditions and potential cross-national heterogeneous effects.

Hypotheses

Information Effects

Some nonexperimental studies have examined the influence of pension-related knowledge and retirement expectations and behaviors. For example, one study found that U.S. citizens who expect Congress to lower social security benefits in the next 10 years expect to work significantly longer (Szinovacz et al., 2014). Similarly, lower rates of defined benefit pension coverage were found to explain 23% of the notable increase in workers' self-reported probability of working past age 65 (Mermin et al., 2007). Moreover, by observing the timing of their retirement, well-informed workers appear to be more responsive to the incentives built into pension programs than ill-informed workers (Chan & Stevens, 2008). Other studies have focused on the impact on policy attitudes. Consistent with rational-choice theory, citizens in France, Italy, Germany, and Spain who are aware of the contributions they make to pension programs are more likely to desire an unconditional opting out of compulsory pension provision than citizens who cannot report the contributions they make (Boeri et al., 2001).

There is also a *prima-facie* association between financial literacy and better financial outcomes (Alessie et al., 2011), but endogeneity issues again give reason to exercise caution. For example, more future-oriented individuals are more likely to seek financial advice in the first place (Hershey et al., 2010; Wang & Shultz, 2010), making it questionable whether financial literacy is the ultimate causal driver of saving behavior. In fact, the literature has disappointed early hopes that financial education could significantly alter people's financial literacy (Alessie et al., 2011) or saving behavior (Hastings et al., 2013). Similarly, a meta-analysis found that "financial education interventions studied explained only about 0.1% of the variance in the financial behaviors studied" (Fernandes et al., 2014, p. 1872).

Survey experiments provide a more robust means to assess the effects of information on individual outcomes, avoiding reversed causality bias. A representative study of German citizens conducted by Naumann (2017) using such a split-sample experimental approach examines the influence of presenting a paragraph describing forecasted increases in life expectancy and noting challenges to the sustainability of pension provision. The findings indicate that citizens given this information show less opposition to increasing retirement age than those not exposed to the treatment. Finseraas and Jakobsson (2014) ran a similar experiment in Norway examining the effects of an informational brochure on pension knowledge and retirement planning. While the treatment enhanced knowledge about the Norwegian pension system, it did not significantly alter people's retirement expectations.

Furthermore, economists have treated the introduction of yearly mailings informing workers about their pension records as natural experiments. Mastrobuoni (2011) examines the effects of sending annual social security statements in the United States introduced in 1995 and finds no changes in workers' expected retirement age after receiving personalized information. Similarly, a recent study analyzes effects of the gradual introduction (since 2002) of annual letters to workers in Germany, reporting small but significant increases in private savings and labor earnings (Dolls et al., 2018). Although these latter experimental studies reduce risks of causal misidentification, the expected impact should still depend on the context, content, and form in which the information was delivered.

Information Effects on the Expected Retirement Age

Information can only alter expectations through a complex and demanding cognitive process. Psychologists have shown that when exposed to new information, people must assess it based on the limited prior considerations that working memory can muster (Price & Tewksbury, 1997). Subsequently, such information must be understood and internalized. Only then can these descriptive considerations be retrieved from working memory when needed (Maio & Haddock, 2015). However, individuals rarely apply the cognitive effort necessary to relate new information to their prior beliefs (Ciuk & Yost, 2016).

Attitude revision is facilitated if either prior beliefs are found to be inaccurate or motivation is high. As noted above, people have a deficient understanding of demographics and pension policy. This low baseline leaves ample room for learning. Indeed, the information effects found by Naumann (2017) on policy attitudes were particularly intense among citizens with little political knowledge. Moreover, if actors have a strong motivation to learn, they can overcome cognitive laziness, examine new facts, and extract implications of

these facts for their prior beliefs (Visser et al., 2007). Such motivation may stem from the strong human desire to guarantee one's economic well-being (Lupia & McCubbins, 1998).

In what direction should information on demographics and pension generosity direct revised attitudes? According to a widespread narrative, the financial difficulties currently faced by public pension systems are mainly driven by population aging and, moreover, can be effectively addressed with pension cuts (Ebbinghaus & Naumann, 2017). In many countries this narrative has become prevalent; hence, population aging, financial sustainability problems, and pension cuts are deeply embedded elements in the public discourse. While the demographic shift may also undermine the political support for pension reforms, population aging is mostly perceived as a challenge to financial sustainability (Dorbritz, 2008). We therefore hypothesize that reliable forecasts should induce concerns over future pension levels and encourage the postponement of expected retirement to ensure an adequate individual pension (H1). Exposure to the forecasted drop in replacement rates should have a similar effect. Knowing that pension purchasing power will likely decline should lead to a later expected retirement age (H2).

Expected Country-Level Differences in Information Effects

The three countries considered differ substantially in regard to their demographic, economic, and institutional characteristics. Table 1 summarizes the key differences that can shape the influence of information treatments on retirement expectations. First, the three countries vary in the expected future levels and changes in population aging and public pension benefits. Concerning forecasted population aging, experts concur that in the medium term, the German and Spanish populations are aging faster and will remain older than the U.S. population (Rouzet et al., 2019). We thus expect the information on demographic trends contained in the first treatment to be less striking for American than for German and Spanish respondents, leading to weaker information effects on retirement expectations in the United States than in Europe (H3).

Similarly, the effect size of the second treatment could depend on the level of and trend in public pension generosity itself. Based on the content of the benefits treatment, we hypothesize that the effect is strongest in Spain (H4) for two main reasons. First, the projected drop in public pension replacement rates between 2015 and 2040 (based on pension legislation already in place) will be much stronger in Spain than in the United States and Germany (23, 12, and 5 absolute percentage points, respectively); second, unlike workers in Germany and the United States, workers in Spain do not receive official information about their expected benefit from social security; thus, Spanish workers may be less informed about current and future pension levels than American and German workers.

However, apart from the pension levels themselves, institutional incentives for deferring retirement may also shape treatment effects. In countries with stronger incentives workers have fewer reasons to retire as early as possible; furthermore, by having a greater margin of maneuver regarding the age at which they wish to retire, they may give greater weight to information about future pension levels. In this regard, the United States has the strongest institutional investment to defer retirement, followed by Germany and Spain (Table 1). This institutional factor thus leads to a competing hypothesis, namely that the effect is strongest in the United States (H5) followed by Germany and Spain.

Method

Data

To assess the influence of two types of information (demographic and benefits-related) on the age of expected retirement, this study draws on a cross-national survey experiment. This approach allows the controlling of the information provided to respondents. Data were collected from a stratified online survey conducted in the spring of 2018 in three selected countries—the United States, Germany, and Spain (Fernández et al., 2018). The survey

Table 1. Institutional and Demographic Differences Between the Three Countries

	United States	Germany	Spain	Sources
Type of welfare state	Liberal—based on market	Continental—based on market and state institutions	Southern-European—based on family and state institutions	Ebbinghaus and Manow (2004), Esping-Andersen (1999)
Penalty for combining pension and employment income	No, after age 67	No, after age 67	Yes, after age 65 reduction of pension by 50%	
Deferment bonus (per year)	8%	6%	2–4%	OECD (2017)
Penalty for early retirement (per year)	7%	4%	6–8%	
Normal retirement age in 2017	67	67	65 & 4 months	
Unemployment rate in 2018	3%	3%	15%	OECD (2020)

Source: Own elaboration.

was implemented using commercial access panels where respondents were incentivized to participate. Quota for gender, age groups, education, and regions were applied to ensure the representativeness of the population aged 18–69 years. Although there are limits to the generalizability of online convenience samples, a recent replication study demonstrates the reliability of survey experiments using similar sources (Coppock, 2019).

Research Design and Information Treatments

A survey experiment was embedded in the questionnaire, featuring two information treatments on (a) population aging and (b) financial implications for pensions. Each respondent was randomly assigned to one of three clusters (demographic treatment, benefits treatment, and control group). Thus, respondents were randomly selected to be presented with one of two different stimuli; the control group did not receive additional information.

As the goal of the experiment was to test the effects of nonpartisan information on perceptions, the treatments were designed to ensure maximum objectivity. To avoid framing effects or a conflation of different types of information, emotionally and ideologically charged terms were not used, and only one aspect was addressed at a time: for the demographic treatment, trends in population aging, and for the benefits treatment, trends in pension levels. The raw information originates from authoritative official institutions: the Congressional Budget Office (2016) for the United States and the European Commission (2015) for Germany and Spain.

Demographic treatment

The first treatment began with the following question being prompted (to U.S. respondents): "To the best of your knowledge, what is approximately the percentage of U.S. residents 65-year-old or over?" After respondents gave their answers, they were shown this text: "Social scientists agree that the U.S. population is aging. This means that the proportion of older citizens is increasing. According to recent scientific research, the proportion of the population 65-year-old or over in the United States will increase from 14.8% in 2015 to 21.9% by 2040." A follow-up question was posed below: "Were you aware of this information?" (a) Yes, I was aware that the expected increase would be close to that; (b) No, I thought it would increase much more; (c) No, I thought it would increase much less.

Benefits treatment

The following text was shown to the treatment group in the United States: "The average Social Security benefit of a recent retiree is $18,000 and his or her average lifetime earnings are $32,100. Therefore, the average Social Security benefit of a recent retiree is currently 56% of his or her lifetime earnings. What will this percentage be approximately in 2040?" Respondents were prompted to input an integer number, after which the solution was displayed: "The Congressional Budget Office estimates that the average Social Security benefit for a newly retired worker in 2040 will be 42% of the average worker's income." Then, came a final validation check: "Were you aware of this information?" (a) Yes, I was aware that benefits are expected to decrease that much; (b) No, I thought benefits would decrease much more; (c) No, I didn't think benefits would decrease that much. In sum, the dichotomous variable *benefits treatmen*t indicates whether the respondent was in this treatment group and was therefore asked for their guesstimate of benefit levels and thus provided information with the projected value.

Given the varying demographic and policy conditions of the three countries considered, the numeric values of the treatments necessarily differ cross-nationally. Table 2 shows the respective numeric information for each country, along with responses to the treatments for the treated sample.

The average reaction to the demographic treatment was to drastically overestimate the current proportion of the population aged 65+. In all three countries, people thought that this percentage was approximately double the true value. As part of the benefits treatment, respondents estimated the projected pension replacement rate in 2040. Here, the data show a general awareness among respondents of the decline in pension benefit levels. Respondents' estimates were more accurate here, probably due to the cognitive anchoring provided by the current baseline level.

Variables

Dependent variable

Retirement expectations were measured with the following question that was asked once after the two treatments were presented to the treatment groups: "Regarding your retirement: At what age approximately do you expect to retire? By retirement we mean that you will stop having a paid employment." Respondents were asked to provide an integer number of years. In line with an understanding of

Table 2. Content of Information Treatments for Each Country

	United States	Germany	Spain
Demographic treatment			
Old-age ratio in 2015	15%	21%	19%
Respondents' mean estimate	36.7%	38.2%	40.4%
Forecast for 2040	22%	31%	32%
Benefits treatment			
Replacement rate in 2040	42%	38%	56%
Respondents' mean estimate	45.2%	36.2%	62.8%
Baseline level 2015	56%	43%	79%

Notes: For Germany, an error occurred during questionnaire transcription. A 2040 replacement rate of 38% was included in the questionnaire, while the European Commission (2015) published a value of 36%. Given the small difference, we do not expect it to substantially affect the scope of the findings.
Source: Own elaboration.

retirement as late-career work-exit and to limit effects of outliers, answers were bottom- (and top-) coded at 40 and 80 years of age, respectively. We analyze this continuous measure using an ordinary least squares regression with robust standard errors.

Control variables

As mentioned above, individual characteristics such as gender, age, income, and education have been established as robust predictors of retirement expectations. The same general regularities have been reported for retirement planning (Hershey et al., 2010; Moen et al., 2005) and pension policy literacy (Boeri et al., 2001; Holman et al., 2020).

Although sampling quotas were applied, multivariate models therefore also controlled for a set of sociodemographic characteristics: gender; age group (18–29, 30–44, 45–59, and 60–70 years); and number of children. In terms of socioeconomic characteristics, control variables are included for education (tertiary education; upper or postsecondary; and lower secondary or less), employment status (1 = employed and 0 = not employed), job prospects (4-point Likert scale for the probability of keeping one's current job for the next 12 months/finding a new job for the unemployed), home ownership (owner without a mortgage, owner with a mortgage, tenant, or other), and household income (using the modified Organization for Economic Cooperation and Development equivalence scale, standardized).

Sample and Nonresponse

Sample

Respondents who were already retired, permanently disabled, or self-identified as homemakers were excluded from the analysis. Moreover, to avoid random answering routines by panelists distorting our results, we excluded respondents who took less than half of the median duration within their country-treatment group cluster (13–14 min) to complete the survey. We also excluded respondents failing a manipulation check (i.e., a prompt designed to detect careless answering). The analytical sample includes 535 respondents from the United States, 634 from Germany, and 753 from Spain. Balance tests containing sample means are reported in the Supplementary Material (Tables S1a–S1c) and show an overall strong balance in socioeconomic characteristics across treatment conditions.

Missing data

Any missing information on independent variables was imputed using multiple imputation using chained equations ($m = 10$). Following the standard procedure, missing values for the dependent variable were also imputed during the 10 iterations, but these cases were subsequently excluded from the analytical sample.

Results

We begin by showing descriptive evidence for the treatment–outcome association. Figure 1 displays boxplots for the expected retirement age differentiated by country and treatment group. A first notable finding is that distributions are very dispersed in the United States but very concentrated in Germany and Spain. The interquartile range for the control group spans 27 years in the United States compared to 14 years in Germany and only 8 years in Spain. Thus, retirement expectations are less standardized among U.S. preretirees than German and Spanish preretirees, where the majority expects to retire at the old standard age of 65 years or the new threshold of age 67.

Figure 1 also displays the median (gray markers) and mean values (on the right margin) for each cluster. Baseline averages are lower in the United States than in Germany or Spain. Hence, American respondents expect to retire earlier (with 62.3 years) than Spaniards (64.8 years) and Germans (65.1 years). This is somewhat surprising, as the average effective retirement age has historically been higher in the United States than in Germany or Spain (OECD, 2019, p. 179); however, expectations are forward-looking and, as noted, may not always become realized. Regardless, our focus here is mostly on treatment effects rather than country differences in levels.

In terms of information effects, the descriptive evidence provided in Figure 1 shows that U.S. respondents in the demographic treatment group expect to retire 1.6 years later than respondents in the control group. The difference is (even) greater for the benefits treatment. U.S. respondents in the benefits treatment group expected to retire 2.2 years later than respondents in the control group. In Germany and Spain, we also observe slight changes in expected retirement age by treatment status but of much smaller magnitude. At a descriptive level, we thus find some support for the existence of information effects, especially in the United States.

Table 3 shows the results of the multivariate regression analysis with the expected retirement age used as the outcome variable. In the first specification (Models 1, 4, and 7), only treatment status is included, and the reference category is the control group. To reiterate, the treatment

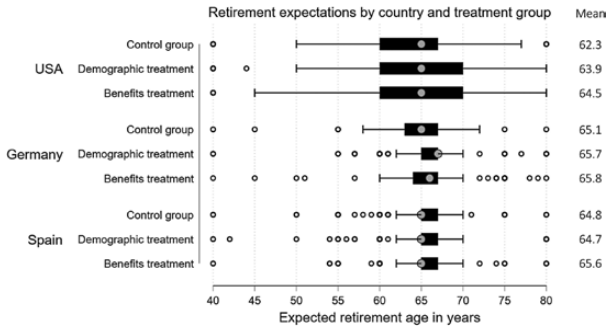

Figure 1. Box plots of expected retirement age by country and treatment group. *Source*: Own elaboration.

Table 3. Multivariate Linear Regression Models Predicting Expected Retirement Age

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	United States	United States	United States	Germany	Germany	Germany	Spain	Spain	Spain
Treatment (reference: control group)									
Demographic treatment	1.584 (0.980)	1.736 (0.934)	1.262 (0.870)	0.692 (0.454)	0.684 (0.459)	0.623 (0.445)	−0.105 (0.428)	−0.020 (0.440)	0.031 (0.443)
Benefits treatment	2.111* (0.918)	2.252* (0.888)	1.894* (0.842)	0.699 (0.426)	0.630 (0.419)	0.447 (0.420)	0.755 (0.402)	0.770 (0.394)	0.827* (0.393)
Female (reference: male)		2.296* (0.742)	1.640* (0.728)		0.624 (0.369)	0.485 (0.372)		−0.757* (0.343)	−0.776* (0.340)
Age (reference: 18–29 years)									
30–44 years		0.678 (1.098)	1.736 (1.084)		0.203 (0.614)	0.416 (0.644)		−0.651 (0.564)	−0.525 (0.607)
45–59 years		4.338* (1.029)	5.125* (1.138)		−0.053 (0.582)	0.397 (0.632)		−0.301 (0.498)	−0.262 (0.579)
60–70 years		6.092* (1.373)	7.519* (1.496)		0.172 (0.714)	0.544 (0.748)		0.042 (0.550)	0.139 (0.673)
Education (reference: lower secondary or less)									
Upper secondary		−2.607 (1.658)	−3.449 (1.775)		−0.422 (0.624)	−0.504 (0.649)		−0.104 (0.450)	−0.115 (0.456)
Higher education		−4.027* (1.691)	−3.657* (1.810)		0.428 (0.661)	0.721 (0.690)		0.530 (0.416)	0.643 (0.442)
Household income			−0.711* (0.303)			−0.452 (0.278)			−0.112 (0.167)
Employed			−0.043 (1.064)			−0.642 (0.754)			−0.275 (0.466)
Job prospect			2.415* (0.449)			0.297 (0.423)			0.004 (0.217)
Home owner (reference: nonowner)			−2.292* (0.778)			−0.469 (0.410)			1.206* (0.480)
Number of children			−0.603* (0.250)			−0.271 (0.163)			−0.116 (0.231)
Constant	62.385* (0.718)	62.496* (1.863)	57.418* (2.355)	65.060* (0.294)	64.857* (0.828)	64.767* (1.292)	64.822* (0.310)	65.306* (0.627)	64.580* (0.887)
N	535	535	535	634	634	634	753	753	753
F	2.71	6.59	6.92	1.74	1.66	1.97	2.98	2.21	1.83
Nested model test		vs (1)	vs (2)		vs (4)	vs (5)		vs (7)	vs (8)
F		8.21	10.07		1.82	1.86		1.49	1.31

Notes: Standard errors in parentheses.
*$p < .05$.

status is a categorical variable that indicates whether the respondent was assigned to the demographic treatment group, the benefits treatment group, or the control group and, therefore, whether he or she was shown the respective information. The demographic treatment does not have a statistically significant effect in the three countries. Although the coefficient for the United States is substantial, the uncertainty of the estimate is too great to reject the null hypothesis. In contrast, the benefits treatment for the United States yields a positive effect of considerable magnitude that is significant at the 5% level. Accordingly, respondents exposed to the projected drop in the pension replacement rate expect to retire 2.1 years later than respondents in the control group. In Germany and Spain, the coefficients are much smaller and do not reach statistical significance.

In the second model specification (Models 2, 5, and 8), we control for gender, age, and education. Treatment effects are not substantially affected by these control variables, and the estimated effect of demographic treatment remains insignificant in all three countries. The benefits treatment keeps having a sizeable positive effect on the expected retirement age in the United States, whereas it does not significantly alter expectations in either Germany or Spain.

In the third step, household income, employment status and prospects as well as home ownership and the number of children are added to the regressions as controls (Models 3, 6, and 9). In these full models, the benefits treatment coefficient becomes slightly smaller but remains positive and significant in the U.S. sample. Moreover, when controlling for all sociodemographic factors, the benefits treatment effect now becomes statistically significant at the 5% level in Spain. In contrast, in Germany the benefits treatment effect remains nonsignificant in all models (4–6). Figure 2 depicts the estimated effect sizes (based on Models 3, 6, and 9) of the two treatments for the three countries. American and Spanish respondents exposed to the benefits treatment expect to retire 1.894 and .827 years (or 10 months) later than respondents not exposed to this information, respectively. H2 is thus supported for Spain and especially the United States, while H1 is not supported for any of the three countries.

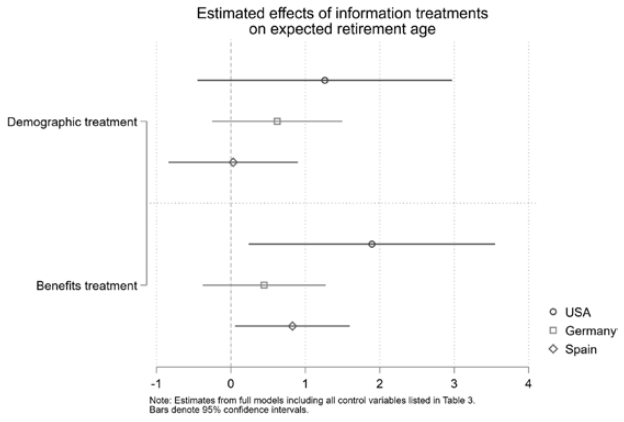

Figure 2. Estimated treatment effects. *Source*: Own elaboration.

Some findings regarding the control variables are worth noting. The U.S. results surprisingly show lower expected retirement ages for women than men, which may be related to limited sample size. More expectedly, we find relatively higher expected ages of work withdrawal among older age groups in the United States. The negative effects of education, household income, and home ownership likely reflect social stratification in private and occupational pension plans. While current employment status does not play a role, people who expect to be in paid employment 12 months after the interview expect to retire significantly later. Interestingly, most variables have much smaller effects in Germany and Spain despite somewhat larger sample sizes. This probably reflects the overall lesser variation in retirement expectations in Germany and Spain.

The evidence shown in Table 3 and Figure 2 also helps us address the hypotheses concerning cross-national variations in treatment effects. According to Models 3, 6, and 9, providing information on future levels of population aging does not robustly affect the expected retirement age in any of the three countries. This clear null finding is inconsistent with H3. In addition, the full models indicate that providing nonpartisan, reliable information on the expected future level of pension replacement rates leads to an increase in the expected retirement age in Spain and, especially, the United States. This major finding is inconsistent with H4 but consistent with H5. Specifically, the effect of the benefits treatment is the strongest in the United States, which is the country with the strongest institutional incentives to defer retirement (H5), and not in Spain, which is the country with the starkest pension retrenchments (H4).

Sensitivity analyses were performed to test for heterogeneous treatment effects by age and gender. As shown in the Supplementary Material, the treatment effects did not differ significantly between men and women (Supplementary Table S2). However, there is evidence for an age-graded reaction to the benefits treatment in the United States (Supplementary Table S3); the adjustment of delaying one's retirement expectations appear to be mostly driven by respondents younger than 50. This result is consistent with the notion that the future decrease in pension generosity is more relevant to current younger-age workers. Finally, a robustness check was carried out by adding the number of persons aged 15 years and older residing in the household as a categorical control variable; even after this addition, the findings remained unchanged (Supplementary Table S4).

Discussion and Implications

This is the first cross-national study to systematically analyze the influence of information about both demographic trends and projected pension benefits on retirement expectations. We use a harmonized survey experiment where respondents are exposed to information regarding aging and

pensions. The cross-national analysis reveals noticeable similarities and differences. Concerning the similarities, the average respondent in the three countries tends to overestimate the future level of population aging. Moreover, providing demographic information does not affect retirement expectations in any of the three countries.

Concerning the cross-country differences, the evidence indicates that German respondents are the best informed about future pension levels, closely followed by American respondents. More importantly, our central finding is that in Spain and especially in the United States, respondents exposed to the expected drop in public pension replacement rates expressed a significantly higher expected retirement age than respondents not exposed to this information. This latter finding suggests that in certain contexts reliable information on pension provision shapes beliefs regarding the individual life course. In Spain and, especially, in the United States—but not in Germany—exposure to the projected public pension replacement rate increases workers' expected retirement age. The strong effect found in this study for the United States is inconsistent with Mastrobuoni (2011), who used data from the mid-1990s and did not find significant effects of mailing social security statements on retirement expectations, although this inconsistency may be due to methodological differences.

How can we account for this striking cross-national heterogeneity in the effect of the information on pension benefits reported above? Differences in unemployment rates, which are equivalent in Germany and the United States; average pension literacy, which are very similar in Germany and the United States; or future pension levels, which are the highest in Spain, certainly cannot explain this cross-national variation. A more promising explanation involves institutional incentives to defer retirement. Countries that provide more institutional incentives to postpone retirement reduce the number of reasons to retire as soon as possible and, as a result, expand the personal leeway in deciding one's age of retirement. In such a context, knowing the expected average benefit offers a helpful cognitive anchor that facilitates sensible retirement planning.

Among the three countries, U.S. Social Security Administration regulations provide the strongest incentives to delay effective retirement because they set a hefty penalty for early retirement, do not penalize combining wages and pensions, and offer the strongest deferment bonus (Table 1). Hence, U.S. legislation encourages more individual-level strategizing of the age of retirement than does German or Spanish legislation, and the United States is also the country where the effect of the information on future benefits is the most intense. Further comparative research, including a larger sample of countries, could provide a stricter test as to whether these institutional incentives significantly shape the effect of benefits information on retirement plans.

Our core finding, that is, information on future replacement rates leading to postponed expected retirement has noteworthy policy implications. Forward-looking elected officials can build on this finding by taking policy measures aimed at strengthening the retirement income of future retirees. Policy makers can launch information campaigns about decreasing social security pensions to further increase public awareness of declining benefits. Upon being clearly and recurrently exposed to this difficult reality, workers should be more inclined to extend their careers and save privately. Both adjustments would lead to higher purchasing power among pensioners and diminished old-age poverty.

A limitation of this study is that because our treatments differed across countries, it is difficult to tell whether the cross-national disparities in findings are attributable to country-specific ways of reacting to information or to variations in actual forecasts. However, making the content of information identical across countries would have implied deception and lessened the social and policy relevance of the study. The three countries analyzed differ in the pace of population aging, in pension systems and projections and in baseline knowledge and information treatment effects found in this study.

To conclude, decreasing defined benefit pensions make savvy retirement planning ever more important. Adequate information is crucial for appropriate preparation. This study has shown that the provision of pension policy information has a substantial role to play in encouraging realistic retirement expectations.

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences* online.

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Conflict of Interest

None declared.

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Author Contributions

J. Radl codesigned the survey and questionnaire, conceptualized the paper, performed all statistical analyses, and cowrote the paper. J. J. Fernández conceptualized the project that funded the survey, codesigned the survey and questionnaire, and cowrote the paper.

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