

Designing Better Pension Benefits Statements

Current Status, Best Practices and Insights from the Field of Judgment and Decisionmaking

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Abstract

Decisionmaking on saving for retirement requires individuals to have knowledge on fundamental issues, such as the functioning of pension systems, portfolio allocation, future expected benefits, contribution histories and risks. Currently, the information provided in pension benefits statements vary widely by plan provider as well as by the nature of benefits offered. The inconsistency could occur partly because recommended best practices for, and empirical studies that test, the design and content of statements vary widely in the literature. Furthermore, little is known on how people think about saving for retirement. Insights from the fields of behavioral economics, and judgment and decisionmaking can fill some of these literature gaps by applying psychological theories to help better inform consumers about their financial decisions and retirement status using benefits statements. In this paper, we provide a normative and positive review of pension benefit statement design. We begin by reviewing best practices and recommendations provided from the trade literature. Next, we describe the content and design of a cross section of statements that are currently being used by plan providers. Finally, we review the academic literature on individuals' understanding of, and information needs related to, pension benefits statements. The latter includes a description of the few studies explicitly researching pension statement design related questions, general behavioral and decisionmaking literature that can be applied to the content and presentation of information, and general literature on whether and to what extent uncertainty should be presented.

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1. Need for a Benefit Statement

Decisionmaking on savings for retirement requires individuals to have knowledge on fundamental issues, such as the functioning of pension systems, portfolio allocation, future expected benefits, contribution histories and risks. Moreover, recent trends in pension reforms around the world, in particular the shift from Defined Benefit (DB) to Defined Contribution (DC) plans, have led to an increase in the individual need for information and for general financial literacy, as DC schemes represent a particular burden in terms of decision making for individuals (Cox, 2011). Benefit statements provide information on the most visible part of pension schemes, and are thus of crucial importance to individuals' decision-making process (Larsson, Sundén and Settergren, 2008). In addition to presenting consumers with pertinent information, benefit statements should trigger individuals to think about retirement, and increase their awareness to changes over time in a number of uncertain factors (Larsson, Sundén and Settergren, 2008; OECD, 2011). Individuals also need updates of their pension savings in order to evaluate their current status and saving strategy to meet their retirement goals. Without such information, consumers are likely to make uninformed decisions about their pension contributions and allocations. However, the OECD (2008) has shown that pension and retirement savings plans are some of the least understood financial products, and that the financial understanding of consumers often makes them unfit for the task of making their own investment decisions. Regulating agencies can help individuals manage decision making related to pensions through regular communication of the choices, and factors of importance in those choices (OECD, 2011).

2. Review of best practices of pension statements

The literature on consumer understanding of pension benefit statements routinely stresses the importance of communicating to consumers how pension plans work, what individuals can expect in terms of benefits in old-age, and the decisionmaking needed for retirement preparedness (Wilson, 2008; Rinaldi and Giacomel, 2008). However, best practices in the design of pension benefit statements remain scarce. In comparison with other consumer products, Larsson et al. (2008) shows that providing efficient product information about

pensions is difficult due to the long time horizon, and the number of years between their purchase and delivery.

Some best practices have been identified, mainly through international comparisons, on the following aspects: form of pension statements, timing of pension statements, contents (in particular, accounting, forward-looking, and system information) and modes of delivery of pension statements. The trade literature also widely recognizes that the design and presentation of information in pension benefit annual statements should be chosen carefully, as they are key to capturing the readers' attention, and may have important consequences on individuals' choices (Cox, 2011; Agnew and Szykman, 2005; Rinaldi and Giacomel, 2008).

Pension statements should also be easy to understand, with an emphasis on the use of simple language, with limited use of jargon (Rinaldi and Giacomel; OECD, 2008). (Agnew and Szykman, 2005) found that narratives perform particularly well for low-knowledge individuals, who give greater weight to non-numeric information. Indeed, the literature shows that graphs should be included with great care. For instance, bar charts can be difficult to understand, frequencies perform better than probabilities, while a range (minimum, maximum, average) performs very well (for a review see Cox, 2011).

The timing of pension statements is crucial for members to monitor the development of their personal balance. Typically, an annual frequency is chosen (Rinaldi and Giacomel, 2008). International evidence shows a considerable variation in the start dates for the distribution of pension statements. Some countries such as Belgium or Hungary distribute annual statements only to older members, while countries like Finland issue statements from the age of 18 (Rinaldi and Giacomel, 2008). Larsson et al. (2008) conclude that best practice involves sending pension information to all participants when they start contributing to the pension scheme, on an annual basis. The authors also suggest targeting information to certain life events, such as changes in marital status, having children, or approaching retirement, inviting members to apply for certain benefits as appropriate for their situation.

Annual statements are usually communicated to members of pension plans in printed form. Some practitioners argue that only summary information on investment outcomes should be presented in annual statements (OECD, 2011; Larsson, Sundén and Settergren, 2008), while

others recommend including detailed information on investment decisions, such as individual projections (Rinaldi and Giacomel, 2008). Larsson et al. (2008) also recommend that information on other old-age benefits, such as survivor and disability benefits, should be included in the pension benefit statement (Larsson, Sundén and Settergren, 2008). Documents outlining best practices advise of a potentially negative impact with increasing amounts of detailed information in pension benefits statements. The concern over this information overload has led several countries, such as the UK and Spain, to pass legislation requiring simple and understandable information (Rinaldi and Giacomel, 2008). Thus, a best practice related to the level of detail to be provided in pension benefits is yet to be determined. Cognitive overload (Sweller, 1988; 1994) is discussed further in Section 3 of this document.

However, best practices do advise that detailed information and tools to evaluate income needed in retirement be made available in accompanying materials or on a website (OECD, 2011; Larsson, Sundén and Settergren, 2008). One example of such a website is a pilot project conducted by the Chilean government involving an online pension simulator to convey pension information and uncertainty about future pension benefits (OECD, 2011). While internet services present advantages over paper statements in terms of providing more comprehensive, flexible, and individualized information, they can be legally and technically problematic. For instance, major difficulties can arise when combining information on various sources of retirement income, such as public, occupational, and private plans (OECD, 2008). Finally, since it can be challenging to combine public, private and occupational pension plans in the same source, information on the printed benefit statement should encourage members to consider all retirement income sources, and provide information on where to find information related to other pension plans (Larsson, Sundén and Settergren, 2008).

Pension statements typically contain four types of information: accounting information, forward-looking information, system information and information related to investment policies:

- *Accounting information* includes the name of the pension plan, contributions and earned pension credits, current asset allocation and development in the account since

the last statement date. It is considered the most important piece of information, and should be comprehensive by covering all pension accruals from various sources (Larsson, Sundén and Settergren, 2008; OECD, 2011).

- *Forward-looking information* generally contains expected benefits and investment returns on a time horizon of several years, while appropriately warning the members regarding their uncertain future fluctuations (Rinaldi and Giacomel, 2008). Variation of expected benefits with age may also be presented to members. Flexible tools such as websites with risk simulators allow members to change the assumptions on income growth, fund growth, and retirement age (Larsson, Sundén and Settergren, 2008), while some scenarios can also be presented in the benefit statements, such as the impact of postponing retirement (OECD, 2011).
- *System level information*, as provided in the United States and Germany, includes warnings regarding future necessary benefit cuts or tax increases affecting retirement income (Larsson, Sundén and Settergren, 2008).
- *Investment policy information* includes information on rates of return, administrative fees, and a description of investment options with their risk-return profiles made available to members (Rinaldi and Giacomel, 2008). While it is good practice to qualitatively characterize the level of risk, no consensus has emerged on whether and how it should be supplemented by measures of volatility. Rinaldi and Giacomel (2008) however suggest an assessment of the risk profile of members when joining the plan that would allow an appropriate matching with a suitable investment option.

Overall, it is crucial to carefully evaluate the tradeoff between the value of a wide variety of information and simulations, and another layer of confusion (OECD, 2011). The uncertainty inherent in any pension projections, due to risks in financial markets, labor markets and demographic changes, is often misrepresented in statements. Deterministic projections, without probability ranges exemplify the tradeoff between simplicity and completeness of information on uncertainty. It is thus regarded as best practice to carefully design projections

on future pension benefits, providing ranges of probabilities under different scenarios (OECD, 2011).

Finally, as suggested by Larsson et al. (2008), it is good practice to assess the effectiveness of pension statements continuously through evaluations. Information campaigns should therefore also include plans for evaluations.

3. Current benefit information provided by pension plans

Benefit information provided in pension benefits statements vary widely by plan provider as well as by the nature of benefits offered. The latter is typically dependent on whether the plan is a defined benefit or defined contribution plan (or a combination of the two). RAND reviewed the information presented in approximately 20 pension benefits statements. The following section summarizes the content and presentation of information contained in these statements.

3.1 Defined benefit plans

In comparison to defined contribution plan statements, the information in defined benefit plan statements tend to be relatively simple, in part because participants do not make investment decisions within their DB plans. Participants typically only make decisions on retirement age and age at which to start receiving benefits. Thus, benefits in these plans are typically defined in the statements by simple rules relating years of employment and some measure(s) of salary to a lifetime annuity payment.

Defined benefit plan information typically includes (1) whether the plan participant has qualified to receive benefits AND (2) benefits currently accrued AND/OR (3) projected benefits at 'normal retirement age'. Where relevant, further distinctions may be made between theoretical benefits accrued and *vested* benefits accrued, if the participant has not yet worked enough years to be 100 percent vested in the plan. Future benefits may also be projected for ages other than normal retirement age.

As described above, there are relatively few variables to consider when making projections. Plans typically assume that the participant will (i) work continually from the

present time until they reach normal retirement age and (ii) will continue to earn at their current earnings level. These assumptions may not be very helpful for younger workers, who might expect their earning level to increase significantly before reaching retirement age, but should provide fairly accurate projections for workers with flat earnings growth and known future tenure.

The statement of Benefits from the U.S. Social Security plan includes projected benefits not only for normal retirement age of 67, but also for early retirement age of 62 and delayed retirement age of 70, and provides a link to a retirement benefit calculator that allows projections for different ages. Social Security also emphasizes that projected benefits are based on the assumption that the current benefits laws will not change. For example, a statement from 2009 contained the following statement in bold type: “Congress has made changes to the law in the past and can do so at any time. The law governing benefit amounts may change because, by 2037 the payroll taxes will be enough to pay only about 76 percent of scheduled benefits.”¹

3.2 Defined Contribution plans

As compared to defined benefit plan statements, defined contribution plan benefit statements can be very complex. The large number of variable factors in these plans result in large amounts of information that could be conveyed to plan participants. The greater complexity also means that projections into the future require a greater number of assumptions both about participant behavior and performance of assets. Plan participants can have control over a wide range of decisions, from how much to contribute to their plan, to how to allocate their portfolios over different types of funds over time, to how they wish to receive their benefits at retirement. Providing permutations of all these factors, and providing for each permutation a range of possible results reflecting the uncertain future performance of risky assets, would be infeasible in a summary document. The DC benefit statements that RAND

¹ Note that although the 2009 sample benefit statement provided to RAND States that by “2037 the payroll taxes will be enough to pay only about 76 percent of scheduled benefits” the SSA website currently states by “**2036** the payroll taxes will be enough to pay only about 77 percent of scheduled benefits.”

evaluated contained significant heterogeneity in the information that defined contribution plan providers choose to report.

3.2.1 Basic account information, portfolio allocation and realized performance

All benefit statements provide the account balance and some measure of how this has changed since the last statement. Statements for plans that allow for portfolio allocation choice typically report this allocation across different funds in percentages and/or dollars, but vary widely in further level of detail provided.

Some statements present a breakdown of the allocation across funds for the most recent contribution, or for different contribution streams (e.g. participant contributions, employer contributions). Many statements present a measure of how the performance of individual funds has contributed to the overall performance of the fund (recently/historically). Complementing this information, some plans provide benchmarking information against index funds or performance of other funds that the participant could choose to add to their portfolio. Some statements present a 'personal rate of return' to reflect the performance of a person's overall portfolio. This appears to help distinguish between account balance growth due to investment returns and account balance growth due to new contributions. Finally, some (but not all) statements provide detailed information on the fees and expense ratios associated with each fund.

3.2.2 Risk information

Plan benefit statements vary widely in their presentation of risk information. All statements have disclaimers that past performance is no guarantee of future performance. However, not every statement indicates the level of risk associated with the plan portfolio or its component funds.

One statement that RAND reviewed provides a simple overall risk analysis of the participant's plan portfolio, placing the portfolio on a five-category risk/return scale based on the percentage of stocks held in the plan. The statement also provides advice relating this risk rating to retirement goals, for example suggesting that a risky growth-oriented portfolio might

be too risky for people intending to retire within the next 20 years. On the other hand, the federal government's Thrift Savings Plan statement does not explicitly describe risk, but does reflect the risk/reward profile of funds as "Funds for Stability", "Funds for Long-Term Growth", or "Funds for Long-Term Growth and Stability". Many other statements we reviewed provided no risk information.

3.2.3 Projections

Plans vary widely in whether they provide future projections, what form those projections take, what assumptions are used to generate those projections, and how those projections are presented.

More than half of the sample plan statements we reviewed present no information about future expectations, or the relationship between future outcomes and current savings/investment behavior. Among statements presenting projections, the most common outcome projected is an estimated monthly income in retirement. However, an estimated account balance at retirement is sometimes given in conjunction with, or instead of, the monthly income figure.

The estimated monthly income may be either (a) the expected annuity payment for an annuity purchased with the estimated balance at retirement, or (b) a managed distribution of the final account balance over some fixed time frame. For both types of estimated income, projection assumptions include *retirement age*, *future contributions*, and *rate of return* on assets. Assumptions about *mortality rates*, *annuity interest rates*, and election of *spousal survivor coverage* are required for annuity payment estimates. An assumption about *expected duration of retirement* post-65 is required for the managed distribution estimate.

The standard retirement age is assumed to be 65. The standard assumption for future contributions is that they will continue at the current level (typically, the dollar amount over the last 12 months), but this is not always stated explicitly. A conservative rate of return of six percent is the most common assumption, though two providers assume seven percent. These assumed rates of return are not personalized to the participant's actual portfolio allocation.

For annuity purposes, age-specific mortality rates are assumed to be the same as at the present time. The sample statements reviewed assume future annuity rates of 3.5 percent-4.0 percent. Statements vary in assumptions about the plan participant's marriage status at retirement and assume 100 percent survivor coverage (though it is unclear whether plans base this assumption on present marital status).

The statements show a surprisingly large range of assumptions for duration of retirement post-65. For example, one provider assumes a 30-year retirement, while another assumes a 20 year retirement. This could lead the same individual to get significantly different estimates of the monthly income. However, for this specific example, this effect is partially offset by the former's assumption of seven percent return on assets pre-retirement, compared with the latter's assumed six percent return.

3.2.3.1 Presentation and permutations

Different statements present projection information in different ways, and with different permutations. Most statements that RAND reviewed presented some projection information on the first page of the summary document, and highlight it with large text or other visual emphasis. Most statements provide some sort of table/text box with the monthly income; one provider complements their statement with a graph.

One provider provides the permutation of different retirement ages and marital statuses, presenting a table of projected annuities for people retiring at 60, 62 and 65, for single people and married people choosing an annuity with 100 percent survivor benefits. Two other providers both present projected monthly income for different contribution levels: current level of monthly contribution, 'current level + \$100', and (one of these providers only) 'current level + \$250'. Another provider presents the investment balance that would be realized based on savings rates of five percent, ten percent and fifteen percent per year and on current income. However, this statement ignores current account balance and contribution rate.

Assumptions are presented in different ways across statements, but do not tend to be prominently displayed.² Some plan providers state brief assumptions under the projection information, but in very small font and/or italics. Alternatively, one provider provides the most detailed set of assumptions (including inflation-matching increases in nominal dollar contributions and a correction factor used to put the final projection into real dollars), but places it in the middle of a large list of disclosures at the end of the document.

3.2.3.2 Alternative projection

One of the statements that RAND reviewed provides an alternative type of projection, calculating “Estimated Contributions Needed for Retirement”. This is calculated as the monthly contributions needed to reach a retirement savings balance large enough to support a 75 percent replacement of current earnings, assuming a retirement age of 65 and a given rate of return.

4. Academic Literature Review on Pension Benefit Statement Understanding

In the following section, we review the literature on individuals’ understanding of and information needs related to pension benefits statements. First, we will focus on how individuals set their retirement goals, and how they think about retirement. Next, we will review literature on consumer preferences and understanding of benefit statements’ design, as well as potential underlying psychological factors that could affect this. Both components of this review should provide guidance on how to better inform consumers about their financial decisions and retirement status using benefits statements.

4.1 How People Think about Retirement

The literature on decision-making related to retirement has primarily focused on savings choices, including asset allocation, the contribution rate and the decision to save (Gough and Niza, 2011), leaving the field of individual perception and thinking about retirement savings and income under researched. However, multiple studies have shown that people may not provide

² Presenting the assumptions less prominently may help to reduce the ‘cognitive load’ for less sophisticated plan participants, while still providing full information for those who want it – see later discussion in 4.2.2.2

adequate consideration of their financial needs in retirement. For instance, many people have no concept of how much they need to save to maintain their standard of living during retirement (Schellenberg and Ostrovsky, 2010; Millar and Devonish, 2009; Loewenstein, Prelec and Weber, 1999; Byrne, 2007). Retirement goal-oriented research has focused on the impact of stable retirement goals on well-being and psychological adjustment when leaving the labor force, but few have explored goals and their relation to financial planning for retirement (Hershey, Mowen and Jacobs-Lawson, 2003). Retirement goal clarity has, however, been shown to be a significant predictor of planning practices for retirement and retirement savings tendencies (Stawski, Hershey and Jacobs-Lawson, 2007; Petkoska and Earl, 2009).

A few studies that explicitly address how people think about retirement have provided initial results. For instance, a survey of 1,665 Dutch respondents found that about 63% of households thought about retirement “a lot” or “some”, while 35 percent of households thought only “a little” or “hardly at all”. When asked about their expected income replacement rate upon retirement, the surveyed Dutch workers who showed lower financial literacy were more likely to overestimate retirement income replacement rates and less likely to be aware of the future uncertainty related to retirement income (Alessie, van Rooij and Lusardi, 2011; van Rooij, Lusardi and Alessie, 2011). An online survey of Barbadian respondents conducted by Millar and Devonish (2009) also found a lack of planning for retirement, particularly among low-income earners. Furthermore, pension investment was reported to be a low priority when thinking about retirement, while home ownership was considered the most valuable retirement asset (Millar and Devonish, 2009).

Neoclassical economic theory suggests that individuals use a life-cycle savings model when thinking about retirement savings, trading off current versus future consumption. That is, individuals will borrow against future income in their early years, then save during their productive years, and finally rely on saved assets when exiting the labor force (Modigliani and Brumberg, 1954). The assumptions underlying this theory have been questioned by various authors (see, for example, Thaler, 1994). Not only are the assumptions underlying the lifecycle model debatable, but there is ample evidence that retirement savings behavior does not follow the predictions of the model. As one example, Chalmers and Reuter (2009) observed the

payout choices of over 32,000 retirees in the Oregon Public Employees Retirement System and found people tend to undervalue the worth of life annuity payments when compared to receiving an actuarially equivalent lump sum.

Neoclassical economics assumes that people perfectly understand and account for the uncertainty inherent in many of the variables underlying retirement savings (e.g., rates of return, etc.). Studies have suggested that people may not be aware of all of these uncertainties (Vlaev, Chater and Stewart, 2009), and that even if they are, they tend to believe that it is outside of their control (OECD, 2011). Finally, the classic life-cycle model may be unrealistic because it assumes that people are rational actors (Thaler, 1994). On the contrary, people are influenced by underlying psychological factors that can lead to sub-optimal retirement savings choices (Gough and Niza, 2011).

For example, individuals may be subject to ‘mental accounting’ when making retirement savings decisions. That is, people tend to violate the principle of money’s fungibility: people assign different income sources to different “accounts” and treat the balances in different accounts as imperfect substitutes. (Hastie and Dawes, 2009; Shefrin and Thaler, 1988; Thaler, 1994; Card and Ransom, 2007). For instance, Card and Ransom (2007) found that supplementary savings (that in addition to any retirement savings) of a sample of professors from various universities was more sensitive to pension contributions from the employee than the employer. Thus, the results suggest that these professors created different mental accounts for employer and employee contributions.

The mental accounting theory challenges the fungibility assumption underlying the life cycle savings model (Thaler, 2004). Individuals also tend to discount future events such as retirement, which tend to be more abstract than current events. This discounting could lead people to be less concerned about their standard of living after retirement, which in turn could result in undersaving for the future (Zauberman and Kim, 2010; Trope and Liberman, 2003). Thus, pension benefit statements should be designed with consideration to such psychological characteristics, as well as to address people’s informational needs.

4.2 Consumer preferences and understanding of benefit statements' design

When exploring the literature on how benefits statements can be designed to better inform people's retirement decision-making, we focus on: (1) studies explicitly researching pension statement design related questions, (2) general literature on the content and presentation of information, (3) general literature on whether and to what extent uncertainty should be presented.

4.2.1 Relevant Studies

There are only a few studies that specifically explore these three areas in regards to pension benefits statements. Accordingly, conclusions that can be drawn from relevant academic literature are quite limited.

A study published by the OECD presents the case of an online pension simulator in Chile, enabling individuals to explore various assumptions on parameters such as contributions, retirement age, or returns on investment to evaluate future projected retirement income (OECD, 2011). Pretesting of this web tool showed that users prefer to receive information regarding their expected pension in monetary terms rather than as a replacement rate. Several output formats were tested, for example a velocimeter displaying the probability of reaching the desired pension with and without voluntary savings, columns representing confidence intervals for the expected pension, and pie charts. However, none of these options proved successful in conveying the probability concepts to the users.

The results of the OECD study show that participants preferred the following information to be included in the tool: expected pension at the age of retirement, pension payment for the 5th percentile ("pessimistic scenario pension"), pension payment for the 95th percentile ("optimistic scenario pension"), and the probability of having a pension payment equal or greater than the desired pension specified by the user (OECD, 2011). In addition, desired features of the tool included an option to see results if people postpone the retirement age by three years, as well as the ability to experiment with changing a key variables, such as: age at retirement, frequency and amount of future contributions (OECD, 2011).

In 2005, the Government Accountability Office (GAO, 2005) led six focus groups to investigate how well workers understand the statements produced by the Social Security Administration (SSA). Focus group participants praised the SSA statement for being comprehensive, but the length and detail had some perceived drawbacks. For instance, the same statement format is used for all workers, which can lead to irrelevant information being presented to some recipients. This led to some confusion and dissuaded some individuals from reading to the end of the document. Thus, the report recommends that public pension statements could be customized by the age of the worker or other relevant status to make it more engaging and relevant. Focus group participants also suggested they would like projected retirement income for additional potential retirement ages to what is currently presented on SSA statements (i.e., early retirement age of 62, normal retirement age of 67, and delayed retirement age of 70). Finally, focus group participants noted several features they liked in the private sector plan statement, including a pie chart demonstrating the percentage of current income that would be replaced by the private sector plan and by Social Security, as well as the remaining percentage that would have to be met³ through private savings. Participants liked the private sector statement's more frequent use of graphics and color, stating that it provided information in a more visually appealing and comprehensible way.

Vlaev, Chater and Stewart (2009) investigated various presentations of risk information in the context of retirement savings, providing survey participants with 11 alternative risk descriptions and asking them to rate the descriptions for usefulness, understandability and suitability. The highest rated description was one presenting risk as variation between a minimum and maximum value, with a median in between.⁴

³ Note: the implicit assumption in this presentation is that individuals need to save enough to achieve 100 percent income replacement in retirement. This may be an overestimate of the income individuals require to maintain their present standard of living in retirement. However, the pie chart does demonstrate what percentage of income would be replaced in the absence of any private saving.

⁴ The exact wording of the description: "The precise amount of your pension is unpredictable because of possible variation in investment performance, but it is very likely (more than 95 percent chance) that it will be between certain minimum and maximum values with some average in between. For instance, if you invest in this fund, then it is very likely (95 percent chance) that your annual retirement income will be more than £4,153 and less than £23,248, and on average (50 percent chance) you can get more than £9,825 (thus here we show you minimum, average and maximum possible returns)."

A study conducted by Goda et al. (2011) suggests that including information about the relationship between pre-retirement contributions and post-retirement income, as well as, how this information is presented can significantly impact people's contributions rates. The authors conducted an experimental evaluation of a direct-mail intervention for pension plan participants, aiming to help them better understand how their pre-retirement savings behavior affects their post-retirement income. Three different incremental treatments were included: (1) general retirement planning materials, (2) the same materials as in treatment 1, as well as a projection of total retirement balance resulting from additional hypothetical pre-retirement contributions, and (3), the same materials as in treatment 2, as well as an income projection after retirement given the retirement balance in treatment 2. Results suggest that the cumulative effect of all information components (e.g., treatment 3) had a significant effect on contribution rate of participants, but that the marginal effect of any one information addition was not significant.

Goda et al. (2011) also tested the effect of different projection assumptions. While changing the rate of return on investments had no effect on participation and contributions, using a higher retirement age of 67 instead of 65 had a significant positive effect on participation status, contribution rates and dollar contributions for non-participants, but did not have a significant effect on initial participants. Furthermore, when projections were presented using higher-valued graph axes (i.e., [\$100, \$200, \$500] instead of [\$50, \$100, \$250]), initial non-participants made significantly larger contributions, showing evidence of a 'framing effect' (see discussion below).

While Goda et al. (2011) tested the change in participation and contribution rates between different projection presentations, the study does not provide insights into people's comprehension and preferences related to those projections. An extensive review of the literature only resulted in one study that explored the presentation of pension projections using a qualitative methodology. Sykes and colleagues (2008), of the U.K.'s Department of Work and Pensions, interviewed 80 participants in the U.K. about their preferences and comprehension related to pension benefit statement projections. The primary finding by these authors was that, "many respondents needed more 'understanding' rather than more 'information' and it is

not immediately evident that forecast documents are the right vehicle...for plugging gaps in basic knowledge.” That is, in many cases, participant understanding related to projections, underlying assumptions, annuities and inflation effects was so insufficient that large amounts of educational materials would be needed to significantly increase comprehension. The authors questioned whether the benefit of the information would be outweighed by the information overload that participants would experience

Specific findings of note from Sykes et al. (2008) include the inability of participants to understand the difference between real and nominal prices. Projections presented to participants used the term “today’s prices,” which was found to be confusing⁵. Furthermore, the authors concluded that participants generally did not understand the significance of real values when thinking about likely future income (Sykes et al. 2008). Participants also had difficulty understanding the concept of an assumption as the basis for developing projections. The interviews suggested that people did not read the list of assumptions and found them to be rather lengthy and uninteresting. Finally, participants were found to have difficulty understanding the difference between an annuity and a pension fund, as well as between various annuities that could be purchased (Sykes et al. 2008).

The studies reviewed in this section leave many unanswered questions related to people’s understanding and preferences toward pension benefit projections, as well as more generally toward overall pension benefit statements. Conclusions are specifically lacking with regard to effectiveness of different presentations. While few studies have directly addressed these questions, we can draw helpful insights from relevant literature in the fields of risk communication, judgment and decision-making and behavioral economics. However, the empirical literature on risk communication clearly concludes that we cannot know what information to present and how to present it without some empirical evaluation and refinement of those messages with members of the target audience (see, e.g., Morgan et al.,

⁵ The exact wording of the definition for ‘today’s prices’: “Don’t forget that when you retire inflation will have increased the cost of living. We’ve estimated how inflation will reduce the buying power of your pension and the figures below reflect the potential impact of inflation over the period to your retirement.”

2002). Thus, the following section should be seen primarily as a guide of potential considerations for future statement design.

4.2.2. Content and presentation of information

4.2.2.1 Money Illusion

Money illusion is a term used to describe mistaking nominal currency for real purchasing power. When making decisions over a short time span, the value of money does not normally undergo significant changes, but over a longer period a small annual inflation rate can significantly erode the purchasing power of a nominal amount of currency. People who fail to recognize this will systematically overvalue future dollar amounts, and may therefore fail to save adequately for the future. Shafir et al. (1997) provide numerous examples of empirical evidence, suggesting that people often think about economic transactions in both nominal and real terms, and that money illusion arises from an interaction between these representations, which results in a bias toward a nominal evaluation. For instance, the authors asked 431 members of the general public to rank a set of hypothetical people in terms of their success in their housing transactions. All hypotheticals bought houses at the same price, but at different times. Each person sold their house one year after buying, but at different prices and levels of inflation/deflation. Almost half of survey respondents ranked the person with the largest nominal gain, but the smallest real loss, as being the most successful. Shafir and colleagues (1997) found similar results when testing people's attitudes to nominal changes (with no real change) in sales and acquisition, salaries and contract decisions. Many other studies show respondents make decisions and choices based on money illusion (e.g., Kahneman, Knetsch, and Thaler, 1986; Fehr and Tyran, 2001; Kooreman et al. 2004).

It is important to consider money illusion when designing pension benefit statements. When projecting future savings and/or retirement income, individuals should be aware that nominal currency amounts may not represent real future purchasing power. Existing pension benefit statements use differing methods for dealing with this issue when projecting future income. One statement that RAND reviewed deals explicitly with the difference between nominal and real dollars by assuming a three percent-per-year discount factor for the final

income stream, but also that an individual's nominal contributions will increase by three percent each year in line with an assumed inflation rate. The result is that these complicating assumptions largely offset each other. In contrast, several other statements do not discount future income, nor do they increase future nominal contributions, providing the same overall values as the former presentation.

Aside from general money illusion due to the general inflation rate, purchasing power of retirement income dollars could potentially erode if prices for certain specific goods (those consumed by retirees) increase above the rate of inflation. This could be taken into account in the discount factor applied to future dollars, or in the suggested targets for adequate retirement income.

4.2.2.2 Simplifying Complex Information

When designing pension benefits statements, it is important to consider whether the target audience can understand the information presented and can use it to inform their retirement decision-making. If statements use language that is hard to understand, or overwhelms people with more detailed information than is necessary for making decisions, the statements will not be effective.

Considering the Reading Level of the Audience

Although specific audiences may be capable of reading advanced prose, risk communication experts recommend writing communications at the 5th grade reading level for members of the general public (National Work Group on Literacy and Health, 1998; Weiss and Coyne, 1997). In order to simplify the complexity of text-based information, Morgan et al. (2002) therefore recommend that communications can use shorter words and sentences, and include words that are more frequent in common lay language. This strategy has been shown to improve reader comprehension (Baker, Newton and Bergstresser, 1988). Longer words are more likely to be rare and unfamiliar; and, while some less-frequently used words may be understandable to readers, they may still require more processing time to understand (Chin and Bruin de Bruine, In preparation; Faaß, Kaczmirek and Lenzner, 2008). Similarly, longer

sentences can overload an individual's working memory, which in turn makes the content harder to understand (see, e.g., Just and Carpenter, 1980).

Avoiding 'cognitive overload'

Cognitive load theory (see Sweller, 1988; 1994) is concerned with the manner in which cognitive resources are focused and used during learning and problem solving. With finite cognitive capacity, information that is too complicated or voluminous may produce cognitive overload in the audience, leading them to ignore or give up on the message. When designing statements, the literature on cognitive overload recommends removing extraneous information that is not decision-relevant.

In some cases, conceptually complex material cannot be simplified very much without losing important details or misrepresenting the meaning. In this type of situation, Mayer and Moreno (2003) recommend a strategy of segmentation: breaking down the information into bite-size segments, allowing people to digest one piece of information before moving to the next. In the context of pension benefit statements, this could be applied to breaking apart large descriptive paragraphs into a chain of smaller text boxes, for example.

Examples of these phenomena were seen in focus groups discussing the Social Security Administration pension benefit statements (GAO, 2005). Reading comprehension was a problem for some participants, who highlighted words and phrases such as 'actuary', 'intermediate assumption' and 'compact between generations' as difficult to understand. Similarly, some participants said that the sheer volume of information discouraged them from trying to read the whole statement. However, there was heterogeneity in response – some participants felt that the statement did not include enough information on certain issues – which indicates that there is a balancing act in finding the correct amount of information to include. Customized information for individuals may be difficult to produce, but would enable statements to maximize the useful information that could be conveyed while minimizing the cognitive load caused by irrelevant information.

In several of the pension benefit statements we reviewed, the presentation of benefit income projections and their underlying assumptions illustrate the tension between providing

full disclosure and minimizing cognitive load. The most sophisticated participants may want to check the projection assumptions against their own circumstances and beliefs, and adjust the projections accordingly; but less sophisticated participants may be overwhelmed by details they do not understand. Balancing these two issues, many of the benefit statements we reviewed prominently show projected income value using page layout, font and other techniques, but present the projection assumptions much less prominently.

4.2.2.3 Framing effects

Framing effects are a manifestation of cognitive bias that occurs when presenting logically equivalent information in different ‘frames,’ producing different decisions. When information is presented in a specific frame (e.g., wealth versus changes in wealth; mortality versus survival), people tend to adopt it, and proceed to evaluate the options in that frame (Knoll, 2011). Simple changes in how an idea is presented can therefore lead to dramatic changes in response (e.g., Tversky and Kahneman, 1981), and decision makers themselves can interpret information in multiple ways depending on whether they are using certain mental shortcuts for interpretation (e.g., Stanovich and West, 2000). In pension plan statements, shifting from a broad frame (e.g., total retirement savings needed) to a narrow frame (e.g., monthly contribution needed) may help people save by allowing them to recognize that saving large sums of money for retirement may not be as daunting as it seems (Benartzi and Thaler, 2001). Furthermore, presenting the participant with some hypothetical future contribution levels may provide a frame that influences the range of possible contributions the participant believes to be reasonable. For example, one statement that RAND reviewed provides calculations based on an increased contribution of \$100, which may frame \$100 as a level to which a person can aspire. In contrast, another statement provides calculations based on a \$100 increase AND a \$250 increase, possibly causing the \$100 to increase seem relatively moderate and more easily attainable.

Much research has been conducted exploring the framing of investment decisions, but not about framing within benefit statements (Benartzi and Thaler, 2001). One recent paper (Brown, Kapteyn and Mitchell, 2011) examines how framing effects may influence people’s

choice of when to begin claiming Social Security. The authors found that when they framed the claiming of Social Security at an older age as a ‘gain’ in investment relative to claiming at the normal age, this led people to prefer the delayed claiming. Preference for delayed claiming was not found when they framed the claiming Social Security at a young age as a ‘loss’.

Another framing effect relevant to retirement plans is the ‘anchor and adjust’ heuristic. In ambiguous situations, a seemingly trivial factor may form an “anchor” that serves as a starting point for estimation or decisionmaking. Individuals then evaluate the information in terms of a deviation up or down from the anchor point, even if it is entirely arbitrary, rather than making a free choice from all possible estimation values (Hastie and Dawes, 2009). Many times, individuals may be subject to under-adjustment or “primacy effects” in which the information considered early in the judgment process tends to be over-weighted in the final judgment (Hastie and Dawes, 2009; Tversky and Kahneman, 1974; Chapman and Bornstein, 1996). In benefits statements, anchoring readers to a specific rate of return, desired retirement savings level or age of retirement might result in an under-adjustment to a more realistic value for their personal set of values and preferences. Most pension plan statements we reviewed give a ‘normal’ retirement age as the default (65 or 67), with adjustments provided for early and late retirement, rather than anchoring at early retirement age and adjusting upwards. Of the pension plan statements that offer projections based on different contribution levels, all hypothetical contribution levels were higher than the current level – no plan provided information on how benefits would change if the participant *reduced* their current contributions.

4.2.3 Presenting uncertainty

The literature does not provide definitive advice on the inclusion of uncertainty in benefits statement. While some trade literature identifies the inclusion of uncertainty when describing pension projections as part of best practices (Rinaldi and Giacomel, 2008), others have argued that explanations related to uncertainties in the financial and labor market may be too complex for the target audience of pension benefit statements (OECD, 2011). Overall, there

have been few empirical studies exploring the comprehensibility and usefulness of presentations of uncertainty in risk estimates.

In general, people tend to be unfamiliar with uncertainty in risk assessments, but may only recognize it as a range of risk estimates (e.g., Johnson and Slovic, 1995; Morgan and Henrion, 1990). Thus, the risk communication literature generally tends to recommend that uncertainty should be communicated to the target audience (e.g., Morgan and Henrion, 1990; Ibrekk and Morgan, 1987). While people may not always reason correctly about probability, they can usually get the main point (Dawes and Kagen, 1988). People tend to make errors about the details. For example, Patt and Schrag (2003) found that study participants integrated severity of an event into their probability judgments about climate and weather. On the other hand, people commonly manage to deal with probabilistic weather forecasts about the likelihood of rain or snow, point spreads at the track, and similar probabilistic information. Murphy and colleagues (1980) found that people do well at interpreting probabilistic weather forecasts. However, these examples are only concerned with discrete probabilities and do not include a consideration of continuous variables. Morgan et al. (2002) asserts that the real issue is to frame things in familiar and understandable terms.

The visualization of uncertainty is of particular interest when discussing the inclusion of uncertainty information in benefit statements. Various studies have shown that individuals who are provided with graphical information about uncertainty were able to make better decisions than individuals without graphical information (Roulston and Kaplan; Bostrom, Anselin and Farris; Chua, Yates and Shah, 2006). However, the existing literature is inconsistent as to the best uncertainty visualization formats. Many methods have been proposed in various fields, including education, psychology or environment, but only a few have been empirically evaluated, (for a review see Bostrom et al. 2008). Some authors argue for the use of more than one display when communicating a single uncertain result, but stress that no single graphical format will perform optimally in all contexts (Gillan et al., 1998). They suggest that the best performing displays are those that explicitly contain the information people need to know (Ibrekk and Morgan, 1987). This includes text to explain the meaning of each graph, as well as

any conclusions to be drawn. Finally, the format should be designed with the aim of reducing cognitive effort (Ibrekk and Morgan, 1987).

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Appendix A. Gaps in the literature: Suggestions for Notice of Proposed Rulemaking

1. Overall concepts

- a. To what extent do participants in retirement plans, on average, correctly understand:
 - i. The concept of a projection/forecast and that projections are dependent on assumptions?
 - ii. The concept of an annuity and the difference between an annuity and a pension?
 - iii. The concept of inflation and how inflation affects future values?Are there common mistakes or misperceptions in the above?
- b. How do people form expectations regarding the replacement of current income during retirement? What is the relative level of income expected on average? Do they think about this as a percent or in absolute terms?

2. Content

- a. Which of the concepts mentioned in 1a are most likely to be prioritized by participants in retirement plans for inclusion in their benefits statements?
 - i. How do participants prefer this information explained? How is this information likely to be best explained (if different)?
- b. To what extent do participants desire information in their benefits statement about:
 - i. Projected account value at retirement?
 - ii. Projected income at retirement?
 1. As a monthly or annual income?Is there any evidence that participants who already receive this information find it useful, or not useful?
- c. What projection assumptions would participants most like to see reported on the benefit statement? Which assumptions are most important to report (if different?)
- d. If terms 'nominal' and 'real' are perceived as too technical, are there more accepted or easily understood terms or ways to explain these concepts?
- e. When reporting past performance, which performance periods do people want to see on a statement (e.g., since last period, year to date, last 12 months)?
- f. When receiving a statement of benefits, would participants desire or benefit from an additional 'guide' included on (1) how to decide whether they are saving enough for retirement, (2) precautionary considerations they should be thinking about when looking at projections? Alternatively, would such additional information be viewed as excessive/ not helpful/overload? Is there value in including such a guide for specific groups of participants? At specific times of year?

3. Presentation

- a. How and where should assumption information be displayed? In a footnote, on a separate leaflet, or prominently? Which location is most optimal, given the

tradeoff between ensuring that participants read this type of information and creating overload?

- b. How and where should text be displayed that explain the numerical and graphical information on the page? On a separate page (presented before/after/on a leaflet), next to or below the numbers/text?