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Understanding Pension Communications at the Organizational Level: Insights from Bounded Rationality Theory & Implications for HRM

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Abstract

This paper applies concepts from bounded rationality theory to develop an integrative model to understand how pension scheme structure and pension scheme communication impact pension participation and contribution rates at organizational level. Organizational pension policies create framing effects that can have intended and unintended consequences depending on how they impact on employees' cognitive processes. Organizational pension communication policy impacts employee pension outcomes through the interaction between fast-acting, automatic System 1 and deliberative, calculating System 2 that typically endorses and occasionally overrides System 1 judgments. System 1 exhibits mental short-cuts (heuristics) and systematic biases. The likelihood of a System 2 challenge to System 1 depends on the personal, socio-demographic and economic characteristics of the individuals within the workforce. We propose that those within the HR function, who understand framing effects, can develop pension policies that positively affect pension plan outcomes at the organization level, specifically the pension participation and average contribution rates, using a combination of policies that in some cases promote System 2 endorsement and in other cases, System 2 engagement.

Keywords

Occupational pensions; defined contribution; pension policy and practice; compensation and benefits; bounded rationality

1. Introduction

Employers offer pensions as a benefit to their employees, often to attract, motivate and retain the caliber of employees required for success in their industry. According to McGill et al. (2005, p.

355), "the prevalence of [pension] plans being offered by large employers makes it virtually imperative for all employers … to offer some form of retirement program." Pensions and retirement plans have, therefore, become an important dimension of employee compensation and benefits. One of the key debates in occupational pension research and policy literature is how to ensure employees participate in pension plans and invest sufficient funds over their working lives to provide for income during retirement. However, research indicates that there are serious shortfalls in both pension participation rates (i.e. the proportion of employees investing in occupational pension plans) and in the adequacy of those investments to meet future income needs in retirement (Munnell & Bleckman, 2014; OECD, 2013; Sass, 2014). Employers and their HR function play a critical role in pension savings behavior through the pension plans that they offer to their employees.

Weiner and Doescher (2008) discussed two general approaches to promoting occupational pension savings: structure and communications. Structural approaches emphasize the financial conditions surrounding the retirement savings decision that can be altered by both governments and employers, including tax relief, defaults (e.g. automatic enrollment into an occupational pension plan) and employer matching arrangements. They describe communication approaches as focusing "…on changing both workers' knowledge and their perceptions" of pensions (Wiener & Doescher, 2008, p. 137). They suggest that communications can be used to educate and persuade employees to invest in their pensions. However, most pension research focuses exclusively on pension structure. Studies of note analyzing the impact of pension structure include research conducted by Madrian and Shea (2001) and Choi et al. (2002, 2004a) which investigated the impact of changes to occupational pension plan structure, specifically automatic enrollment, on pension participation and contribution rates at the firm level. Other research has

considered the impact of other structural features such as employer matching (Benartzi & Thaler, 2007; Choi et al., 2004b), the number of investment funds available (Benartzi & Thaler, 2001; Cronqvist & Thaler, 2004; Huberman & Jiang, 2006; Papke & Poterba, 1995), and automatic contribution rate escalation (Benartzi & Thaler, 2007; Choi et al., 2004b; Thaler & Benartzi 2004; Van Derhei, 2007).

Because the organizations where empirical research was conducted concerning structural pension policies were large, it is likely that there was significant communication with employees about their compensation, pay and benefits, and in particular about their occupational pension plan. However, in pension research examined to date, there is limited insight about pension communication policies that accompanied the structural change within organizations. While the evidence suggests that changes to pension plan structure significantly impact individual pension savings behavior, the contribution of pension communications is an important but largely ignored variable in understanding pension savings behavior within the organization. We argue that pension communication policies can be developed by the HR function to both support pension structural policies and to challenge pension plan members to evaluate their choices; the combination of both approaches should improve both employee and organizational pension outcomes.

It is well established that pension saving decisions for members of defined contribution (DC) pension plans are among the most complex decisions undertaken by individuals during their lifetime for many reasons (Choi et al., 2005, 2009; Lusardi & Mitchell, 2007; Madrian & Shea, 2001). Retirement decisions are taken over decades under different personal and employment conditions. The total amount required depends on length of life and health at retirement, circumstances unknown during periods of employment. Economic conditions including

fluctuating equity markets and price instability impact on the rate of return on investments. These factors test the knowledge and computational competence of DC pension plan members resulting in pension decision-making complexity that makes it difficult for individuals to estimate how much to save in order to accumulate sufficient resources to provide adequate income between retirement and death.

Bounded rationality is used to "…designate rational choice that takes into account the cognitive limitations of the decision-maker—limitations of both knowledge and computational capacity" (Simon, 2008, p. 893). We suggest that it provides a useful theoretical lens to understand pension decision-making as it provides insights on decision-making where rationality is limited by incomplete information and cognitive limitations for decisions that involve both risk and uncertainty.

This paper contributes to the literature in a number of important ways. First, much of the pension research examined to date, focused on pension structure resulting in a lack of attention to pension communication at the organizational level, an important dimension that may influence occupational pension savings behavior. This paper significantly adds to the literature by using a bounded rationality model to conceptualize the impact of both structure and communication policies on pension organizational outcomes enabling the evaluation of these two major pension policy levers using a single integrated framework. Second, drawing on bounded rationality theory to examine the limitations of individuals' cognitive processes, we explain how structural policies, particularly defaults, promote intuitive or passive decisions while communication policies may either support those decisions or promote reasoned decisions. Third, we discuss within the bounded rationality model a number of personal, socio-demographic and employment characteristics identified through research, that appear to impact on the ability of individuals to

make reasoned or active pension decisions. We suggest that HR professionals who understand the characteristics of their workforce can develop structure and communication policies suited to the needs of the employees within their workforce. Fourth, the model will allow those in the HR function to predict the outcomes of changes to pension policies, based on the impact of policies on employees' cognitive processes and to evaluate if policies work as intended. Finally, the paper proposes research questions generated from bounded rationality theory and pension research which provide an agenda for future empirical studies in the field.

Following this introduction, Section 2 of the paper discusses the most common forms of occupational pensions, describes structure and communication policies used by organizations offering occupational pension plans as inputs to the pension decision-making process and defines the organizational pension outcomes, namely the participation and average contribution rates, that can be used to evaluate pension policy effectiveness. Section 3 draws from bounded rationality theory to explain the cognitive processes that intervene between pension policies and pension outcomes, proposing a model (Figure 1 below) that can be used by practitioners to develop and evaluate pension policy changes. We conclude with a discussion of the theoretical contributions of this paper and the implications for practice.

2. Pension Definitions, Organizational Pension Policy Approaches, & Organizational Pension Outcomes

2.1 Pension Definitions and Pension Plan Types

A pension plan "is an arrangement that provides for payments to be made to a worker on retirement from paid work, or his/her dependents in the event of death" (Kenny, 2004, p. 1). Defined benefit (DB) and defined contribution (DC) are the two main types of occupational

pension plans in use. DB plans are relatively simple from the perspective of the pension plan member/employee. Post-retirement benefits are usually based on a predetermined formula applied to years of service and earnings. Typically, pension plan members who work for 40 years will receive two-thirds of their pre-retirement income from retirement until death. If employees contribute, the employer specifies the percentage of income and automatically deducts that amount from wages. Fully funded DB plans provide secure pension income for retired employees from retirement until death.

Kenny (2004, p. 1) describes a DC pension plan stating "…the benefits are determined solely by reference to contributions paid into the plan and the investment return earned on those contributions - there is no specific promise or guarantee of particular benefit levels, except perhaps on death." DC pension plans are complex and costly for the individual employees, generally non-professional investors, because of the large number of choices that they are required to make (Barr & Diamond, 2010). Although automatic enrollment (discussed below) is increasingly adopted, especially by large private sector organizations, many organizations require employees to join their pension plan by 'standard' or 'voluntary' enrollment meaning that employees must 'opt in' deciding how much to contribute and choose one or a combination of investment funds from different risk options. The final value of the investment fund depends on both contributions and investment returns (Clark & Unwin, 2010) which must last until the end of life, though the duration of this time period is unknown at the time that decisions are made.

Retiree longevity, investment volatility and regulation increased the cost of DB sponsorship leading many organizations to either wind up their DB plans entirely, replacing DB plans with a defined contribution (DC) plan, or to offer a DC plan to new entrants (Aaronson & Coronado,

2005; U.K. Pensions Commission, 2004; Ireland. The Pensions Board, 2014). The international dimension of this trend is observed by the OECD (2012, p. 11) who state, "private pensions are much more likely to be of the defined-contribution type, meaning that individuals are more directly exposed to investment risk and bear themselves the pension cost of living longer."

2.2 Organizational Pension Policy Approaches: Pension Structure & Communications

Weiner and Doescher (2008) suggest that there are two organizational approaches the HR function can adopt to promote employee pension participation and adequacy (level of income required to maintain an individual's pre-retirement lifestyle) resulting from sufficient contributions: the structural approach and the communication approach. They state, "***Structural approaches*** attempt to change the conditions under which people save" (Weiner & Doescher, 2008, p. 138). From the occupational pension perspective, this includes pension plan characteristics like defaults, the number of investment funds and matched employer contributions. Willis (2013, p. 1157) defines pension defaults as "…settings or rules about the way products, policies, or legal relationships function that apply unless users, affected citizens, or parties take action to change them." Carroll et al. (2009) observe that the intentional use of pension defaults as a policy lever to increase participation and adequacy has become increasingly common. Employers are responsible for determining what pension default plans they offer employees. This is often done through a consultation process with trustees, pension providers and/or pension fund administrators and by consulting relevant government legislation or guidelines (discussed below). Four of the most common pension defaults are presented in Table 1.

Table 1: Common Occupational Pension Plan Defaults and Descriptions

Pension Defaults	Description
Automatic enrollment	Employees, often at the time that they join an organization or after a short vesting period, become members of the occupational pension plan. In some cases, employees can 'opt out' of the pension plan.
Contribution rate	This is the percentage of income contribution that is deducted from pay at the time of automatic enrollment. For most plans, employees can increase their contribution rate. In some plans, employees can decrease or temporarily suspend contributions depending on their financial situation.
Investment fund choice	At the time of enrollment, the employees' savings are invested in a fund chosen by their employer. Employees can switch to funds that more accurately reflect their risk preferences.
Automatic escalation	The percentage of salary or wages saved increases incrementally, generally by 1-2% per year (Clark et al., 2015), often timed in sequence with pay raises. Employees can change the percentage of their salary that they contribute depending on their financial situation.

If an organization decides to automatically enroll employees into a pension plan, they must decide the contribution rate and investment fund choice for those employees unwilling or unable to choose. Automatic escalation need not be linked to the other defaults but is more likely to be a feature of pension plans with automatic enrollment. Default pension polices, therefore, are aimed at increasing participation and contribution rates by reducing the complexity of pension decision-making as employees are presented with pension decisions made by their employer.

The second approach to increase employee pension participation and contribution rates is the ***communication approach*** which centers "on workers' knowledge and their perceptions. The former occurs through education (e.g. teaching the fundamentals of investing); the latter occurs through persuasion (e.g. creating normative pressures or enhancing the perceived importance of one's retirement years)" (Weiner & Doescher, 2008, pp. 137-138). Weiner and Doescher (2008) suggest that persuasive messages can reinforce a person's subjective assessment of their performance developing employee optimism that sufficient retirement savings is achievable.

The communications approach can also be used to improve employee cognitive functioning and decision-making capacity through financial education (Weiner & Doescher, 2008). Lusardi and Mitchell (2014, p. 6) describe financial literacy as "peoples' ability to process economic information about financial planning, wealth accumulation, debt and pensions." Calling for financial education in the workplace, Mitchell and Lusardi (2015) observe that employees are increasingly required to make complex decisions about their retirement savings, including how much to contribute to their pension funds and how to invest their retirement savings – all of these decisions require a certain level of financial literacy.

Pension communications can also inform. Larsson et al. (2008, p. 135) define pension information to pension plan members (described as 'insured') as "…timely data on the effect of a course of events or action/inaction by an insured on the expected size of the pension benefit and the contribution". Pension information is most useful to financially literate pension plan members. Although the purpose of information is to assist individuals to make sound pension choices, it is necessary but not sufficient. As discussed by Mitchell and Lusardi (2015) above, individuals must have the ability to process the information.

Larsson et al. (2008) identified three types of content conveyed through a number of sources including governments, employers and pension providers, suggesting that comprehensive information from all pension sources is best so that employees have a full picture of their benefits at retirement. A*ccounting information* is the most basic information provided on coverage indicating whether employees are members of a pension plan, how much they have contributed to the plan, details of any employer matching arrangements, rates of return on investment, and pension management costs. *Action/course of event information* is the next level of pension communication which focuses on informing participants about the impact of various

actions and events on future pension benefits. This information explains the expected pension benefits that will be received at a choice of retirement ages and influences decisions about changing savings rates and possible retirement dates. This is quite difficult information to convey for DC plans because there are so many sources of uncertainty including the total amount contributed, the rate of return on investment and the method of drawing down pension benefits at retirement, to name but a few (Larsson et al., 2008). *Uncertainty (risk) information* is especially important for DC plans because individuals bear the risk of their investment choices requiring them to have knowledge about financial markets and how to balance risk and return (Larsson et al., 2008). The most complicated of all information content, uncertainty information needs to convey how future benefits can vary depending on the risk of investment fund choices.

There is considerable debate about the efficacy of the structural and communication approaches for increasing pension outcomes. Some researchers believe that the structural approach, specifically defaults, is the "main alternative to education as a method of influencing decisions about retirement saving plans… in a way that will promote the desired objectives" (Benartzi & Thaler, 2007, p. 100). On the other hand, according to Benartzi and Thaler (2007), the limited empirical research on the communications approach is not conclusive about its contribution to either the pension participation or contribution rate. Dolan et al. (2010) argue that trying to change the way employees think, through communication, is expensive with little impact on individual pension saving behavior. They argue that even small changes to pension choices and the environment in which employees make pension decisions can have significant effects on pension participation and contribution rates.

While research on structural pension policy changes indicates that they significantly impact pension participation rates, some researchers suggest that they will not ensure sufficient income

for retirement (Beeferman & Becker 2010; Muller & Turner 2013; Wu & Ruthledge, 2014). For people who do not begin saving until they are middle-aged, for those in precarious employment who move in and out of the workforce, and for women whose careers are interrupted by caring activities, changing the structural features of pension plans may not be enough to ensure pension adequacy. Both Oehler and Werner (2008) and Lusardi (2008) suggest that education could supplement pension structural arrangements like automatic enrollment. Lusardi (2008) argues that pension defaults and financial education programs are not necessarily substitutes – rather, they should be used to complement each other. Lusardi and Mitchell (2014, p. 35) suggest that an unresolved issue is "which sorts of problems are best suited to remedying through financial education, versus removing choice options from consumers' menus altogether or simplifying the options that people face." They suggest that structure alone will not be enough to increase participation and contribution rates arguing that "the human capital approach to financial literacy suggests that there will be substantial heterogeneity in both financial knowledge and economic behavior, so that it is unlikely that any one default rate or environment will enhance well-being for everyone" (Lusardi & Mitchell, 2014, p. 35).

Another issue that requires examination is the interaction of pension communication policies with structural policies. Legislation specifies the minimum communication requirements between pension plan sponsors and their members (Ireland. The Pensions Authority, no date; U.S. Department of Labor, 2014). Pension plan sponsors must communicate with members to achieve compliance with national legislation. In the U.S., for example, employers must comply with regulations from both the Internal Revenue Service (IRS) and the Department of Labor. IRS regulations require among other forms of communication, a notice when an employee becomes a plan member, a notice for introducing automatic enrollment, and an individual annual

benefit statement (U.S. Internal Revenue Service, 2016). The Department of Labor provides guidelines concerning employee communication that must be followed in order to comply with the Employment Retirement Income Security Act of 1974 (ERISA). Basic requirements include a Summary Plan Description, a Summary of Material Modification and a Summary Annual Report (U.S. Department of Labor, 2014) McGill et al. (2005) suggest that many organizations sponsor pension plans because they compete for labor with other organizations offering pensions as a benefit. Therefore, organizations communicate with employees about pension availability both to comply with legislation and to promote the competitiveness of their reward system. Therefore, the interplay between pension structure and communication by the HR function must also be considered in relation to their separate and combined impact on organizational pension outcomes.

We are suggesting that both structure and communication policies play an important role in influencing employee pension decisions. Figure 1 illustrates both types of policies as 'inputs' to the pension decision-making process.

2.3 Organizational Pension Outcomes

There are two key pension policy outcome measures related to employee pension decisions. The ***participation rate*** refers to the percentage of an organisation's workforce that is contributing to its occupational pension plan. The contribution rate refers to the amount that an individual contributes to their pension, generally presented as a percentage of their salary. As a benchmark for an organization, an ***average contribution rate*** can be aggregated for the workforce from the contribution rates of individual members. These measures were used by Madrian and Shea (2001) and Choi et al. (2002; 2004a) to evaluate differences before and after the implementation of automatic enrollment policies. Vanguard uses the measures 'participation rate' and the 'average

participant contribution rate' to compare organisations that implement automatic enrollment policies with those that use voluntary enrollment (Clark et al. 2015).

We recognize that other policy outcomes may be important to employers concerned with controlling labor costs. The positive impact of automatic enrollment on participation rates has been widely reported and discussed since 2001. However, in Vanguard's annual report, Utkus and Young (2015) note that just over one-third (36%) of their sponsors use automatic enrollment as part of their structural pension policies. Of these firms, 70% include an automatic annual increase (automatic escalation) which is known to increase the average contribution rate. This suggests that organizations may realize that different structural features will improve employee outcomes but choose not to include them as part of their pension policy.

Utkus and Young (2015) do not speculate as to why employers make different structural choices but it is likely related to firm size and costs. They report that automatic enrollment and automatic escalation are more likely to be implemented by firms with 1,000 or more employees. Hallock (2012, p. 13) suggests that "larger firms have better opportunities to raise worker productivity, which can be returned to the worker" (p. 13) in the form of pay and benefits. Milkovich et al. (2014) suggest that additions or changes to existing compensation policies should be evaluated in relation to the expected benefits (attracting, motivating and retaining productive employees) versus the costs (development, implementation, administration and future resource requirements).

Organizations may choose to evaluate policy changes using outcomes that balance competitiveness with employee welfare. We propose pension participation and average contribution rates as the key pension outcomes of interest because they are relatively easy to

compute using administrative data already collected by organizations and/or their pension providers and as they are the most commonly used outcomes in pension research. Most important, they are outcomes that capture employees' reactions to changes in organisational pension policies. Figure 1 illustrates the pension participation rate and average contribution rate as the outcomes of the pension decision-making process.

3. Bounded Rationality Theory & Pension Outcomes

3.1 Bounded Rationality

Bounded rationality theorist, Herbert Simon (2008) argued that people make decisions under three constraints: (1) available information is incomplete and/or unreliable, (2) the human mind is limited in its cognitive and computational capacity, and (3) the time available to make a decision is limited. Simon (2008) observed that the search for alternatives is seldom complete and is only a sub-set of all possible alternatives. Cognitive and computational limitations mean that decision-makers seldom make the 'best' decision. Decisions 'satisfice' rather than optimize. Tversky and Kahneman (1973; 1974) developed Simon's work focusing specifically on heuristics, mental short-cuts that result in decisions that are not only sub-optimal, they are systematically biased (Kahneman, 2003a).

Much of Simon's work focused on improving decision-making in the context of organizational performance. Simon (1968) noted that while it is difficult for a single, isolated individual to make rational decisions, the environment in which the individual makes their choice can be deliberately altered. Simon (1968, p. 79) stated that one function "an organization performs is to place the organization members in a psychological environment that will adapt their decisions to the organization's objectives, and will provide them with the information needed to make these decisions". Kahneman (2011, p. 411) agreed stating that "although Humans are not irrational,

they often need help to make more accurate judgments and better decisions, and in some cases policies and institutions can provide that help."

To further our understanding of how employers impact employee pension decision-making, the following section discusses how the HR function, in developing pension structure and communication policies, generate framing effects which may positively impact the pension participation and contribution rates at the organization level.

3.2 Framing Effects

Experiments conducted by Kahneman and Tversky examined the ways that language could be used to 'frame' decisions. Tversky and Kahneman (1981, p. 453) describe the perspective of the decision-maker as the decision frame referring "to the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice. The frame that a decision-maker adopts is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision-maker." In some cases, the decision-makers themselves will develop the decision options. In other cases, the options are presented to the decision-maker. In relation to pensions, for example, automatic enrollment frames information in a way that can alter a decision maker's choice although this will be moderated by individual characteristics (discussed further below).

Kahneman and Tversky (1984) identified inconsistent human preferences using empirical research asking a wide variety of research subjects to evaluate choices that were substantially identical but framed differently. They identified a number of framing effects described in Table 2.

Table 2: Framing Effects

Framing effect	Description
Certainty	"…people overweight outcomes that are considered certain, relative to outcomes which are merely probable" (Kahneman & Tversky, 1979, p. 267). This is the judgment that underlies risk averse behavior.
Reflection effect	Respondents faced with two negative outcomes prefer a probable loss to a certain loss, even if the expected value of the probable loss is higher. This is the judgment that underlies risk seeking behavior.
Phrasing effects	"If an outcome is labeled as a loss, a person will think of it as a loss…" (Weiner & Doescher, 2008, p. 157)
Narrow framing	"The decision of whether or not to accept a gamble is normally considered as a response to a single opportunity, not as an occasion to apply a general policy." Kahneman (2003a, p. 1459)

Both the certainty and the reflection effects demonstrate that "the same psychological principle — the overweighting of certainty—favors risk aversion in the domain of gains and risk seeking in the domain of losses" (Kahneman & Tversky, 1979, p. 269). However, certainty is not always desirable, "rather, it appears that certainty increases the aversiveness of losses as well as the desirability of gains" (Kahneman & Tversky, 1979, p. 269). Phrasing effects identified by Weiner and Doescher (2008) incorporate both of these effects, suggesting that the decision-maker responds either positively or negatively depending on the language used. Their inconsistent preferences highlight the importance of communication in shaping decisions. As an example of phrasing effects, Weiner and Doescher (2008) discuss the impact of negative language used by some pension plan sponsors who referred to 401(k)s as 'salary reduction plans'. This phrasing effect acts as an impediment to employees joining their occupational pension plan because it links 'pensions' and 'loss'. They suggest that pension plan communication should be expressed using positive or neutral language for greater participation.

Simon (1956) argued that people make choices one at a time, as the situation arises. Narrow framing, discussed by Kahneman (2003a), suggests that even if decisions are sequential, most people make one decision independently of the next. He states, "the problem at hand and the

immediate consequences of the choice will be far more accessible than all other considerations, and as a result decision problems will be framed far more narrowly than the rational model assumes" (Kahneman, 2003a, p. 1460). Based on their experiments, Kahneman and Tversky (1984) determined that most people are risk averse and dislike losing more than they like gaining a similar amount of money. Further, individuals make choices based on the how it will add or subtract from their current position (the status quo) rather than how much a loss will impact their wealth. In relation to pensions, this suggests that individuals may choose a conservative investment fund to avoid risk in the short-term. This is an example of narrow framing if individuals do not consider either their capacity to absorb the loss which may be small in relation to their wealth or the potentially greater return of riskier choices on their accumulated savings over a period of decades.

Sunstein (2013), Thaler and Sunstein (2003), Choi et al. (2004a) and Erickson (2002), among others, argue that once an organization decides to offer a pension plan, it must make framing choices about how to structure the pension plan and communicate about it to employees. The decisions the organization makes in this regard are not neutral – regardless of how the policy is structured and communicated to employees, it will affect employees' subsequent decision-making processes and pension choices. These authors and many others speak of 'framing effects' in a general sense, rather than specifying a particular type of framing. For example, when discussing the change from voluntary to automatic enrollment, Choi et al. (2004a, p. 81) observe that "seemingly minor changes in the way a choice is framed to a decision-maker can generate dramatic changes in behavior."

Framing effects can be the result of conscious decisions made by the individual described by Thaler and Sunstein (2009) as the 'choice architect'. Employers and the HR function can use

their knowledge of framing effects on their employees' cognitive processes to intentionally develop pension structure and communication policies to impact on organizational pension outcomes. Alternatively, framing effects can be unintentional leading to unintended outcomes. Automatic enrollment produced intended and unintended outcomes that we will discuss in greater detail below.

Referring to Figure 1, framing effects intervene between pension policies and cognitive processes. The impact of framing effects on the cognitive process will be discussed in the next section.

3.3 System 1 and System 2 Cognitive Judgments

Designing organizational policies to influence human behavior requires some understanding of the cognitive processes that impact on decisions. Kahneman and Frederick (2002) explained that two cognitive systems impact decision-making: System 1 judgments are intuitive or automatic and System 2 judgments are reasoned or reflective. Kahneman (2003b, p. 1450) differentiated between the two stating that "reasoning is done deliberately and effortfully, but intuitive thoughts seem to come spontaneously to mind, without conscious search or computation, and without effort." Sunstein (2013) argues that System 1 judgments work fast, are automatic, driven by habits, and can be emotional and intuitive. System 1 judgements tend to be passive whereas System 2 judgements are active. Kahneman (2011, p. 36) describes the capabilities of System 1 as " detecting simple relations ("they are alike," "the son is much taller than the father") and excelling at integrating information about one thing, but not dealing with multiple distinct topics at once, nor is it adept at using purely statistical information". In contrast to System 1, System 2 judgments are deliberative, calculating, take account of probability, and focus on the importance of self-control in decision-making (Sunstein, 2013). According to Kahneman (2011, p 36),

"System 2 is the only one that can follow rules, compare objects on several attributes, and make deliberate choices between options."

System 1 and System 2 cognitive judgment processes are interdependent; all judgments involve both systems. The double arrow between System 1 and System 2 in Figure 1 shows the interrelationship between the two systems. It is assumed that "System 1 quickly proposes intuitive answers to judgment problems as they arise, and System 2 monitors the quality of these proposals, which it may endorse, correct, or override" (Kahneman & Frederick, 2002, p. 51). Thaler and Sunstein (2009) refer to this as the interplay between the automatic system and the reflective system. System 2 will override System 1 if it recognizes that the intuitive judgment is biased. Figure 1 illustrates the 'reasoned' decision showing an arrow going from System 2 to the pension policy outcomes. However, Kahneman and Fredrick (2002) speculated that most judgments are made intuitively and are endorsed by System 2. The reliance on intuition happens because people are not accustomed to thinking hard, and are often satisfied to take action based on a plausible judgment that is quickly and automatically made (Kahneman, 2003b). Figure 1 illustrates the intuitive decision showing an arrow going from System 1 to the pension policy outcomes. Levi (1985) emphasizes the potential for a negative impact on individual decision-making if System 2 endorses System 1 when it should override. He argues, that "the use of the techniques are part of the agent's unreflective repertoire of reasoning practices, she or he exercises no critical control over their use and so relies on them without a moment's thought even in contexts where they go badly wrong" (Levi, 1985, p. 331). In exceptional cases, intuitive thinking can be powerful and accurate particularly when it is a result of high skill and prolonged practice (Kahneman, 2003b). Generally, those who can rely on their intuition are

experts in their fields (e.g. champion chess players and professional athletes have well-developed intuitions).

System 1 and System 2 cognitive judgments have important implications at a number of levels for employee pension savings behavior and by extension organizational pension outcomes. Thaler and Sunstein (2009, p. 6) refer to the 'nudge' described as "…any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives." This suggests that choice architects (e.g. HR staff with responsibility for pensions) can consciously frame pension structure and communication policies leading to predictable organizational outcomes. We are proposing that the framing effects of policies will promote either intuitive or reasoned decisions, depending on whether or not System 2 is engaged and therefore we suggest the following question for future research:

> Research question 1: Do framing effects, intentionally used in developing pension structure and communication policies to generate System 2 engagement or endorsement, impact the employee pension participation and average contribution rates as the policies intended?

Research question 1 (RQ1 on Figure 1) suggests that pension outcomes depend on the impact of policies on the decision-maker's cognitive processes, discussed in the next section.

3.4 Factors Affecting System 1 Cognitive Judgment & Pension Decision-Making Processes

3.4.1 Heuristics and Biases

Heuristics are psychological mechanisms identified by Tversky and Kahneman (1973, 1974) that support intuitive decision-making and are embedded in bounded rationality theory. Heuristics

can be considered as 'rules of thumb' or mental shortcuts which can lead to poor decisions because of biases that sometimes result in severe and systematic errors (Tversky & Kahneman, 1974). Tversky and Kahneman (1974, p. 1124) argue that "people rely on a limited number of heuristic principles which reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations." Heuristics and biases are particularly relevant given the computational and numerical complexities involved in the pension decision-making process. This section explains a number of the heuristics and associated biases developed by Tversky, Kahneman, and others and their relevance to pension decision-making.

Tversky and Kahneman (1973, 1974) identified three heuristics, representativeness, availability and anchoring, which act as principles, processes, or sources of cues for judgment. The *representativeness heuristic* helps individuals to cope with decisions that are computationally challenging. Individuals attempt to match an event with an available mental prototype based on past experiences. If an experience is similar in one respect, the decision-maker believes that it is representative or similar in other aspects rather than taking the time to conduct an analysis that may reveal that the two events are unlikely to be related.

Biases associated with the representative heuristic are mainly related to statistical limitations that negatively impact decision-making. One bias is *insensitivity to sample size*. Probabilities based on a large number of observations drawn from a representative sample are statistically much more accurate than probabilities based on a small sample size. However, empirical research repeatedly found that the majority of participants systematically made incorrect responses based on their intuition rather than the fundamental 'law of large numbers' (Tversky & Kahneman, 1971). For example, an employee may decide to 'opt-out' of their company's 401(k) pension plab based on her experience of losing retirement savings following the closure and bankruptcy

of her former employer, Enron. She thinks that the Enron experience is similar (representative) because both companies offer(ed) a 401(k). However, there may be significant differences. For Enron's plan, "62% of the assets held in the corporation's 401(k) retirement plan consisted of shares of Enron stock" (Congressional Research Service, 2002, p. 1) which were valueless following the bankruptcy. While it is possible that this employee's new employer will promote the purchase of its own shares for the 401(k), it is not likely because fewer employers are providing their own company shares as a 401(k) investment option. In 2005, 25% of employees could invest in their company's shares, a reduction from 70% in 1985 (Wiatrowski, 2008). Only 7% of pension plan members chose their company stock in 2012, opting to diversify their investments (VanDerhei et al., 2013). The employee is demonstrating an insensitivity to sample size basing her decision on one experience, overestimating the probability that the Enron experience will be repeated with her current employer. This error may compromise her retirement security.

The *availability heuristic* considers the sources of information that are used by people and the biases that result from its use. This heuristic is another mental shortcut used to estimate probability. The outcome that is brought most quickly to mind (meaning it is 'available') is thought to be more numerous than others leading to an overestimation of the probability that this outcome will occur in the future. According to Kuran (2007, p. 685), the availability heuristic is considered by cognitive psychologists "…to be a key determinant in individual judgment and perception."

One bias associated with availability is the *retrievability of instances* referring to a tendency to think that "…a class whose instances are easily retrieved will appear more numerous than a class of equal frequency whose instances are less retrievable" (Tversky & Kahneman 1973, p. 1127).

Tversky and Kahneman (1974) suggest that both salience (seeing an automobile accident rather than reading about it) and recent occurrence (happening today rather than last year) make events more available. Pension plan failures where members lost their retirement savings, like Enron in the U.S. and Waterford Crystal in Ireland, were highly publicized and emotive with former employees explaining the large difference between what they expected from pensions and what they were getting. Although pension plan failures are relatively rare, the examples are retrievable and can bias decisions against joining or increasing contributions to a pension plan, particularly while these events are in the media.

Representativeness and availability biases were originally described as separate processes. Kahneman and Frederick (2002) identified a generic heuristic process called *attribute substitution* which includes both representativeness and availability in a single judgment heuristic. Kahneman (2003b, p. 707) summarized the process stating, "a judgment is said to be mediated by a heuristic when the individual assesses a specified *target attribute* of a judgment object by substituting a related *heuristic attribute* that comes more readily to mind." Instead of answering a hard question, the subject substitutes an easier one. In the pension decision-making context, Madrian and Shea (2001) suggest that pension defaults produce framing effects that are used to reduce complexity. Employees remain in pension plans after automatic enrollment because "the initial participation decision is simplified from one that involves evaluating a myriad of options to a simple comparison of two alternatives: non participation… versus a 3 percent contribution that is allocated entirely to a money market fund" (Madrian & Shea, 2001, p. 1178). In this context, the attribute substitution heuristic process involves substituting a target question that is hard to answer, with a heuristic question: 'How much should I save for

retirement?', a difficult question to answer, is replaced with an easy question - 'Should I remain in the pension default plan or opt out?'

Attribute substitution leads to biased thinking because the target attribute differs from the heuristic attribute. According to Kahneman and Frederick (2002, p. 53), the *weighting bias* arises "when cues available to the judge are given either too much or too little weight." Research suggests that with automatic enrollment plans, the default contribution rate and default investment fund choice are given too much weight because they are subsumed into the 'opt in or out' decision. Reliance on System 1 intuitive thinking means that employees do not adequately assess if the defaults are their best options.

An *anchor* refers to an initial estimate or starting point and is another heuristic that is relevant to pension decision-making and System 1 thinking. An anchoring effect "occurs when people consider a particular value for an unknown quantity before estimating that quantity" (Kahneman 2011, p. 119). The initial estimate may be self-generated (Epley & Gilovich, 2006) or externally provided in the formulation of the problem (Tversky & Kahneman, 1974). For example, for automatic enrollment, the default contribution rate serves as an anchor, externally provided by the employer.

Insufficient adjustment refers to the bias towards the initial value that limits the range of adjustments. Epley and Gilovich (2006, p. 311) explain that "in the original formulation, the starting information, or anchor, tends to exert drag on the subsequent adjustment process, leaving final estimates too close to the original anchor". While the anchor is accessible and simplifies complicated judgments, the anchor and subsequent adjustments may be a poor estimate of the unknown value. Pension default behavior may also be explained as an example of the

insufficient adjustment bias. The default contribution rate frames the pension decision and pension plan members tend to slowly move away from this anchor. As stated previously, the default contribution rate at 2-3% of income was considered by researchers to be too low (Choi et al., 2002; Choi et al., 2004a; Madrian & Shea, 2001). Most employees remained at the accessible though inappropriate default contribution rate with those on higher incomes most likely to increase their contributions (Choi et al., 2004a) suggesting that for most pension plan members, intuitive System 1 dominated. Unless the employees made large adjustments from the anchor, Choi et al. (2002; 2004a) and Madrian and Shea (2001) predicted that their retirement savings would be too low.

Although heuristics and biases are often used to explain individual behavior and organizational outcomes, the quantitative research conducted to date has not identified which heuristics and biases are responsible. A more thorough understanding is required so that pension policy framing effects lead to passive decisions with intended outcomes. We suggest that qualitative research is required to address the following research question:

> Research question 2: Do the framing effects of pension plan defaults trigger identifiable heuristics and biases that result in passive pension decisions?

Research question 2 (RQ2 on Figure 1) suggests that some pension policy framing effects may influence pension decisions primarily through intuitive System 1.

3.4.2 Using Communication to Promote System 2 Engagement

Kahneman (2003b, p. 711) states that "an intuitive judgment will be modified or overridden if System 2 identifies it as biased." Used in conjunction with structural policies, communication policies can frame information, promoting better outcomes for the employee, specifically

pension adequacy. Definitions for three classifications of communications and examples are shown in Table 3.

Table 3: Definitions and Examples of Communication Classifications

Classification	**Definition**	**Examples**
Individualized	Communication that refers to the employee by name and their specific personal circumstances	• Individual benefit statements • On-site access to financial advisors, pension providers with one-to-one consultations
Segmented	Communication developed for categories of employees identified by characteristics such as age, gender, income, education	• 'Layered' communication with increasing detail • E-mail shots appropriate to particular groups • Pre-retirement seminars
Targeted	Communication directing the pension plan member to a numerical goal	• Specified savings rate to achieve pension adequacy

Individualized communication addresses the employee by name and refers to their specific and personal circumstances. Organizations that report higher enrollments and increased pension contribution rates use a variety of individualized communication media to advise employees on a one-to-one basis about retirement savings based on their individual needs including hiring in pension consultants, allowing access to on-site financial advisors and providing periodic individual benefit pension statements (Harrison, 2008; Maloney, 2011; Sheridan, 2006). Although it has not been tested, individualized communication may overcome the retrievability of instances bias associated with the availability heuristic. Referring to an individual by name and personal circumstances attracts the attention of System 2. Information relevant to the individual's pension decision replaces potentially irrelevant information that comes quickly to mind.

Segmented communication is framed for groups of employees classified by personal, socio-demographic or employment characteristics. Weiner and Doescher (2008, p. 59) recommend that "*segmentation* should be used to identify both the messages that certain groups should and should not get." Segmented communication policies developed by the employer or pension provider filter irrelevant information allowing the employee to concentrate on information relevant to their characteristics.

Weiner and Doescher (2008) suggest using a segmented marketing approach highlighting how another, 'just like you' is saving for retirement. Admitting that the exemplar may provide very little useful data on which to base a decision, they suggest that this technique is taking advantage of a heuristic that will intentionally lead to biased thinking stating "if communications can lead a person to easily recall a small number of very salient example of people "like herself" who successfully saved for retirement, she will think that she is more able to save" (Weiner & Doescher 2008, p. 145). The ends justify the means if the employee achieves pension adequacy.

However, segmented communication may also help individuals to make reasoned decisions. Research suggests that information content should be segmented to address the needs of different age groups. Montgomery (2011) and Stevens and Van Assche (2013) report that younger individuals prefer general information presenting retirement in an abstract way while workers who are closer to retirement prefer concrete and precise information that provides specific steps and advice. Stevens and Van Assche (2013, p. 4) recommend 'layered' information stating, "The first level of information provided should be straightforward, and then offer the possibility of more detailed information, either through going to another 'layer' on the internet, or through individual contact (phone or walk-in)." Current and potential pension plan members can also be

segmented by their ability to plan whereby more information and advice is given to those with less planning skills (Marconi & Utkus, 2002; Sheridan, 2006).

Both individualized and segmented communications may overcome the attribute substitution heuristic, helping the individual to answer the 'target question' rather than a 'heuristic question'. By providing limited but relevant information, the employer or pension provider may reduce the complexity of the pension decision, resulting in a reasoned System 2 decision aligned to the employee's retirement needs.

A pension communication policy that focuses on a specified numerical *target* contribution rate that differs from the employee's current contribution rate could be used to engage System 2. The quantitative research by Madrian and Shea (2001) and Choi et al (2002; 2004a; 2004b) does not discuss the communication that preceded either voluntary or automatic enrollment. In this situation, a pension communication policy could be developed to identify a target contribution rate that differs from the current default contribution rate. For example, the U.S. pension provider Vanguard, estimates that pension contributions from both employees and employers should fall between 12% and 15% of annual income (Utkus & Young, 2015), a range that is considerably greater than most default contribution rates. A target contribution rate of 12% could present a challenge to the System 1 heuristic that anchors on the default contribution rate to overcome the insufficient adjustment bias that results in a slow movement away from the anchor. The target could promote System 2 engagement and a decision to move quickly to a higher 'target' contribution rate.

Pension research suggests that heuristics can lead to biased decision-making, particularly when unreflective System 1 decisions are endorsed by System 2. The outcomes are sometimes

positive and sometimes negative for the decision-maker. We are suggesting that a variety of communication strategies can be developed by choice architects within the HR function to improve policy outcomes but the cognitive paths may differ. Some will result in System 2 endorsement while others will challenge System 2 to override System 1. To test this, we propose the following question for further research:

> Research question 3: Can organizational pension communication policies intentionally impact employee pension participation and contribution rates by either (i) encouraging System 2 to endorse a System 1 intuitive judgment; or (ii) engaging System 2 to override System 1 and make a reasoned judgment?

The two aspects of research question 3 (RQ3i and RQ3ii) are illustrated on Figure 1. RQ3i reflects an intuitive decision endorsed by System 2 while RQ3ii shows a reasoned decision made by an engaged System 2. Either approach can potentially lead to intended policy outcomes.

3.5 Factors Affecting System 2 Cognitive Judgment & Pension Decision-Making Processes

Ideally, System 2 should monitor System 1 to identify and override any intuitive System 1 errors. Empirical research by Kahneman and Frederick (2002) identified intelligence and statistical sophistication as System 2 characteristics that are likely to reduce decision bias. In the pension literature, there is a range of personal, socio-demographic and employment characteristics that are reported to impact on pension participation. Less information is available relating these characteristics to the contribution rate. We will discuss these factors as potentially impacting on the decision-making capacity of System 2. We acknowledge that there may be other factors determining pension non-participation including the lack of opportunity to join an occupational pension plan as well as a decision not to join if given the opportunity. Also, it would be a mistake to suggest that a decision not to join a pension plan is intuitive; it may be a 'reasoned',

System 2 decision. However, there is considerable policy advice addressed to employers that pension policies should be appropriate to their workforce (for the U.K., see Center for Economic and Business Research 2013; for the U.S., see U.S., Department of Labor no date; for Ireland, see Ireland. The Pensions Board 2013). We suggest that employers who think about the characteristics of their workforce, in relation to their cognitive limitations, will make better pension policy choices. While structural policies should be appropriate for most members of the workforce, communication policies can be designed to cater to employees with different characteristics and we explore these issues further in the following section.

Personal characteristics

Pension research suggests that education, financial literacy and retirement planning are three interrelated personal characteristics associated with pension participation, contribution and accumulation. The research suggests that better *educated* people are more likely: to be pension plan members (MacLeod, et al., 2012); to work for organizations offering a pension plan as a benefit (O'Connell & Gash, 2003; Wu & Ruthledge, 2014); and to save more for retirement (Gough & Sozou, 2005). Clark et al. (2009) found that pension planning was positively and significantly associated with education.

Lusardi and Mitchell (2014) found that education and financial literacy were correlated. Lusardi et al. (2010) found that financial literacy was strongly associated with cognitive ability (based on results from the Armed Services Vocational Aptitude Battery) and greater educational attainment, particularly when participants attended some college. Lusardi and Mitchell (2014) report that "Though it is challenging to establish a causal link between financial literacy and economic behavior, both instrumental variables and experimental approaches suggest that

financial literacy plays a role in influencing financial decision-making, and the causality goes from knowledge to behavior" (Lusardi & Mitchell, 2014, p. 34).

Kahneman and Frederick (2002) observed that people with *statistical sophistication* were less susceptible to decision bias. Pension research links statistical sophistication with pension decisions through the need to understand and evaluate risk, defined by Knight (1971) as measurable or probable uncertainty. Mitchell and Lusardi (2015) and Clark et al. (2014) evaluate understanding risk as an important aspect of financial literacy. Clark et al. (2014, p. 2) suggest that those who are able to accumulate sufficient assets for retirement have the financial knowledge to earn significantly better risk-adjusted investment returns.

Socio-demographic characteristics

In Ireland, the U.K. and the U.S. occupational pension plan membership increases with *age* (Madrian & Shea, 2001; Aizcorbe et al., 2003; MacLeod et al. 2012; Ireland. Central Statistics Office 2011; Ireland. Department of Social and Family Affairs 2007). Clark et al. (2009) found that pension planning was positively and significantly associated with age while Clark and Strauss (2008) found a positive correlation between risk tolerance and age. Similar to Mitchell and Lusardi (2015), Lusardi et al. (2010) reported that a lack of financial knowledge is very common among young people. However, further examination of how age relates to risk decisions shows that the relationship is nuanced. Mitchell and Lusardi (2015, p. 6) reported that "…a sizeable part of the variation in financial literacy is explained by student-socio-economic backgrounds. In other words, variations in financial literacy are already apparent in high school, and these differences appear to increase later in life." Family financial sophistication (based on parents who owned equity shares either privately or through retirement funds) was also

associated with greater financial literacy. Lusardi et al. (2010, p. 18) suggested that a factor in explaining this link is that financial knowledge may be passed from parents to their children.

Several studies suggest that pension plan membership increases with *income* in the U.S. (Aizcorbe et al., 2003; Madrian & Shea, 2001; Munnell et al., 2012; Wu & Rutledge, 2014), the U.K. (Gough & Sozou, 2005; MacLeod et al., 2012) and Ireland (Hughes, 2003; Ireland. Department of Social and Family Affairs 2010 ; Moloney & Whelan, 2009). People on higher incomes may have more resources to divert into long term savings. In countries like the U.S., U.K., and Ireland where tax relief is related to income level, employees on higher pay receive a higher marginal rate of tax relief than lower paid employees which may act as an incentive to save through a pension. Wu and Rutledge (2014) report that in the U.S. most people on low earnings are not employed by organizations offering pension plans as a benefit. In some cases, however, pensions are offered to workers on low wages but they do not participate (Aizcorbe et al., 2003; Madrian & Shea, 2001). Madrian and Shea (2001) found that employees on relatively low incomes, in the organizations that they were investigating, were most likely to persist with defaults that the researchers considered to be inappropriate. In research with both quantitative and qualitative dimensions, Gough and Nurallah (2009, p. 168) found that "the higher the income the more likely the respondent was to be financially literate." Clark et al. (2009) found that people with higher incomes were better at retirement planning.

Gender is also a socio-demographic variable associated with pension behavior. Women are less likely to be members of occupational pension plans than men (Gough, 2001; Hughes and Watson, 2005; Madrian & Shea, 2001; Munnell et al., 2012; O'Connell & Gash, 2003; Wu & Rutledge, 2014). In the U.K., MacLeod et al. (2012) reported that this finding holds for older women. They state, "The percentage of men aged 45 or older having no resources for later life

was lower in each age group compared with women of the same age and the percentage having a private pension was higher" (MacLeod et al., 2012, p. 23). However, no differences were found between women and men under 44 years of age. When women are in stable employment Munnell et al. (2012) found that pension participation among full-time, full-year workers is equal for both men and women.

In the U.K., Gough (2001, p. 332) found that "…the types of jobs that normally do not qualify for pension membership, such as temporary, seasonal and part-time work, are the categories with higher proportions of female workers." In a more recent report, women were found to be 'under-pensioned', more likely to be unemployed or working part-time than men, explained in part by their caring responsibilities (Silcock et al., 2016). Similarly, Duvurry et al. (2012) found a gender pension gap in Ireland due to women's labor market participation shaped by the unequal distribution of caring duties in the home. Women were more likely than men to experience interrupted careers, reduced promotion opportunities, part-time employment, poor quality employment and low pay. In the U.S., Wu and Ruthledge (2014) found that older women (aged 50-58) were less likely to be eligible to join their company's pension plan than older men. In short, it appears that women's lower pension participation rate is a result of weak labor market attachment (discussed further below).

Employment characteristics

Low wages are also related to other employment characteristics, *specifically labor market attachment* as reported by Wu and Rutledge (2014) based on research conducted recently in the U.S. They state, "We find the substantial pension gap between higher- and lower-income individuals is driven primarily by lower-income individuals' weaker labor force attachment and by their lower pension offer rates among those who do work" (Wu & Rutledge, 2014, p. 2).

Weak labor force attachment was also identified O'Connell and Gash (2003) and Duvurry et al. (2012) as an impediment to retirement savings in Ireland. Workers in unstable employment, (i.e. employed after periods of extended unemployment or intermittently unemployed) were less likely to be offered a pension or to be members of pension plans when compared to workers in stable employment. Longer *tenure* with an employer is an important indicator of labor market attachment and is linked to pension plan membership in the U.S. by Madrian and Shea (2001), Choi et al. (2002) and Choi et al. (2004a). Wu and Rutledge (2014, p. 12) found that employees working in organizations with a pension plan have longer tenure and this "…group is also more likely to have had a pension prior to the current job… suggesting that some workers seek out jobs at pension-offering firm." They highlight that it is impossible to infer causation from the data; it cannot be determined if workers join pension plans because of stable employment or if workers seek jobs in organizations with pensions. Though not reported in any research, participation rates that increase with tenure may be a result of repeated communication about occupational pension plans or financial education in the workplace.

Employment status also impacts on pension plan coverage. Full-time workers are more likely to be members of pension plans than part-time workers in the U.S. (Munnell & Bleckman 2014; Wu & Ruthledge 2014) and Ireland (O'Connell & Gash 2003; Ireland; Central Statistics Office 2011, 2005). Munnell and Bleckman (2014) report that employers are more likely to offer pension plans to full-time workers and full-time workers are more likely to participate in the pension plan than part-time workers. In the U.S., Wu et al. (2014) also report that older (50-58 years) part-time workers are less likely to be eligible for any type of pension plan. To the authors' knowledge, there is no research to date that specifically explores labor market attachment, employment status, statistical sophistication and/or an understanding of risk.

However, it seems likely that people with weak labor market attachments may be unfamiliar with pensions and require greater employer effort to improve their System 2 decision-making capacity.

Although many of these characteristics (financial literacy, statistical sophistication, understanding of risk) may not be known to employers, other linked characteristics are known (age, education, income, employment status and previous work history). The personal, socio-demographic and employment characteristics discussed above are likely to impact on pension participation and contribution rates, independent of pension policies. However, we are suggesting that choice architects within the HR function should develop segmented communication policies, directed at specific groups within the workforce to improve pension outcomes. It is especially important to engage those segments of the workforce (young, less educated, low income, part-time, short-term contracts) who are likely to begin saving too late and to save too little. Therefore, we propose the following research question for further study:

> Research question 4: Do segmented pension communication policies, developed after analyzing the personal, socio-demographic and employment characteristics of the workforce, engage System 2, resulting in increased pension participation and average contribution rates for those segments?

Research question 4 (RQ4 on Figure 1) indicates that segmented communication based on personal, socio-demographic and employment characteristics may promote System 2 engagement, resulting in changes to pension outcomes.

We also recognize that the analysis of workplace characteristics may result in a combination of structure and communication policies to promote intuitive decisions for some groups of

employees and reasoned decisions for others. For example, automatic enrollment may be appropriate for new young employees. However, choice architects, including those in the HR function, may use a targeted communication policy aimed at recently hired middle-aged and older employees to alert them that the default contribution rate may be too low to achieve pension adequacy, unless they have retirement savings from a previous employer. To test this, we suggest the following question for further research.

> Research question 5: Do pension structure and communication policies, designed to promote intuitive decisions for some pension plan members and reasoned decisions for others, based on an analysis of workforce characteristics, result in increases to employee pension participation and contribution rates?

Research question 5 (RQ5 on Figure 1) indicates that a combination of structural and communication policies may promote both intuitive and reasoned decisions resulting in changes to pension outcomes.

4. Discussion & Conclusion

Building on the work of Simon, Kahneman and Tversky, this paper applies bounded rationality theory to develop a model to understand how pension plan structure and communication affect two important pension outcomes at the organizational level: namely, the pension participation rate and average contribution rate. To date, much of the occupational pension research has focused on pension structure, particularly defaults resulting in a lack of focus on pension communication at the organizational level by the HR function and a resultant dearth of research about this important dimension of occupational pension saving behavior. We address this gap by

examining the role pension communication can play, both in addition to and independent of pension structure, in impacting pension participation and contribution rates.

4.1 Theoretical contribution

To our knowledge, our paper is the first attempt to provide a theoretical model explaining how pension structure *and* pension communication policies impact pension behavior taking the organization as the unit of analysis. Although other studies have selectively used bounded rationality concepts, particularly inertia, to explain pension savings behavior, we propose an integrated framework to examine cognitive decision-making allowing for a nuanced explication of the relationship between an organization's pension structure and communication policies and their possible impact on pension participation and contribution rates at the organizational level.

Our integrative model adopts the perspective of Kahneman (2003a, 2011) and Sunstein (2013) who argued that all decisions involve the interaction of intuitive System 1 with reasoned System 2 cognitive judgments. Building on the work of Tversky and Kahnemann (1973;1974), the model sets out how heuristics and biases impact on System 1 cognitive processes which can impede effective pension decision-making. For example, reviewing the research related to automatic enrollment, we argue that System 1 dominates the decision-making process and the outcomes can be negative for employees whose unreflective, passive choices can lead to inadequate savings at retirement. We propose conditions under which System 2 cognitive processes can be enabled. Our model suggests that competently framed pension structure and communication policies can engage the System 2 cognitive processes of the employee, changing pension savings behavior.

We argue that framing effects used by choice architects such as the HR function in developing pension structure and communication policies impact on employee pension participation and contribution rates by either endorsing System 1 judgments or challenging System 1 judgments and triggering a response from System 2 to correct or override an intuitive judgment which is sub-optimal. We suggest that the choice architect can develop pension structure policies that take advantage of unreflective thinking of System 1 (to promote participation through automatic enrollment) and communication policies to promote reasoned decisions of System 2 (to increase the contribution rate through individualized and segmented communication).

After reviewing the literature, we suggest that the extent to which an individual engages in System 2 cognitive processes regarding pension decision-making is impacted by personal, socio-demographic and employment characteristics. Therefore, the characteristics of the workforce should determine the choice of structure and communication policies developed by choice architects interested in improving pension participation and contribution rates. While structural policies should be developed for most employees, pension communications can be targeted to meet the particular needs of different groups of employees within the workforce.

4.2 Implications for practice

HR practitioners who develop pension policies for their organizations,play a critical role in shaping employee pension decisions. Academic research about pension communication is limited and therefore, much of what we know has been contributed by pension practitioners, highlighting their importance in extending the frontiers of our knowledge. We hope that this model will encourage practitioners to approach changes to their pension plan in a systematic way: beginning with the desired organizational outcome in mind, framing policies based on their

potential impact on employees' cognitive processes, and evaluating the policies to see if the desired outcomes were achieved.

This model suggests that an organization's pension policy is really a set of policies that can be separated into 'structure' and 'communication' policies and should be developed together. If a structural feature of a pension policy is too difficult to communicate, the change architect should consider changing the structure. For example, a large number of investment funds require substantial explanation. Research suggests that the number of funds should be diverse enough to cover different levels of risk without overwhelming the pension plan member (Ireland. The Pensions Board, 2012; Cronqvist & Thaler, 2004). Reducing the number of investment funds reduces both the complexity of the pension decision and the amount of explanation required. We suggest that communication policies should be developed considering what policy makers want to achieve: to persuade, to inform, or to improve financial literacy. Some communication policies are independent of structure, for example, informing employees about changes to tax relief or the social security system. Because pension communication has been under-researched, we identify for the HR practitioner, individualized, segmented and targeted communication, as types of communication that are considered to be effective providing examples of each type (please see Table 3).

We suggest that pension choice architects need to understand how employees make decisions that are either intuitive (dominated by System 1) or reasoned (dominated by System 2). It is the intentional use of framing effects that is most likely to achieve desired outcomes (greater participation and higher contribution rates) rather than unintended consequences (greater participation but lower contribution rates). Practitioners who understand how heuristics and

biases work, as well as the personal, socio-demographic and employment characteristics of their workforce can design communication policies to meet the differing pension needs of employees.

Finally, our choice of outcomes, the participation and average contribution rates, are easy to calculate using information that it is gathered for other purposes. By including outcomes in this model, we highlight the importance of policy evaluation. After a year, structure or communication policies can be quickly checked to see if they impacted in the way that was expected, allowing choice architects to make adjustments that 'nudge' employees toward greater retirement savings.

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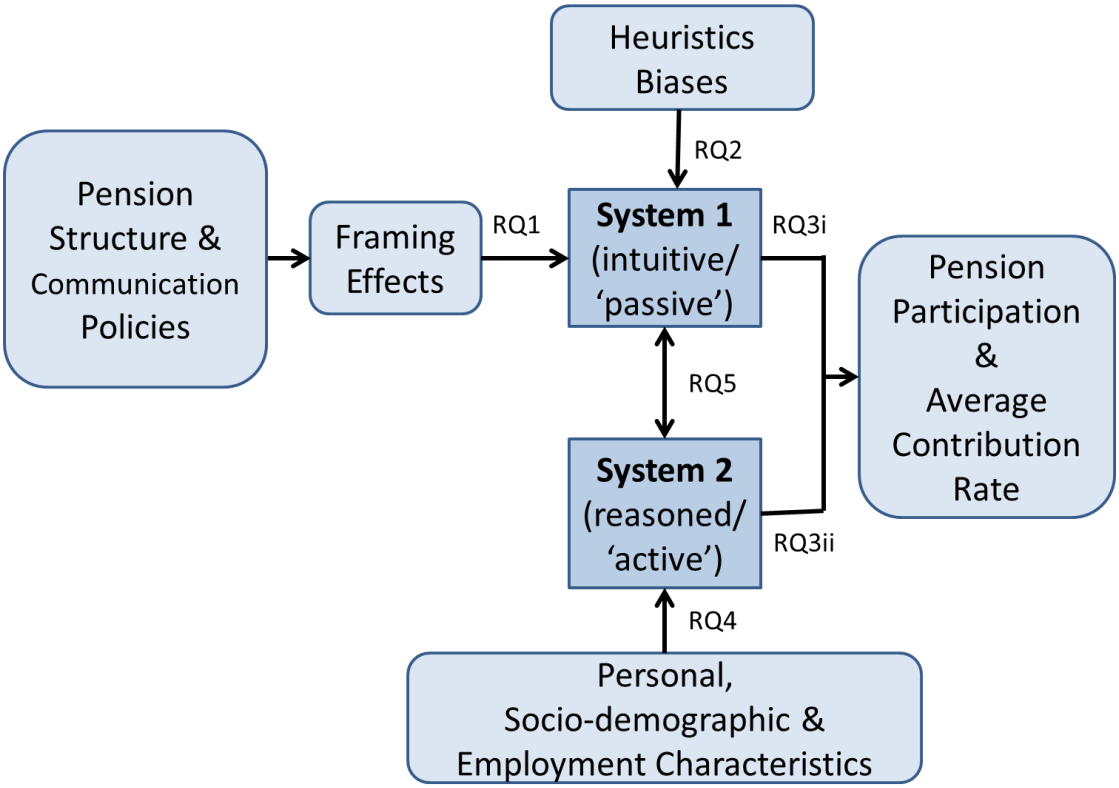
Figure 1: A Bounded Rationality Model of Pension Decision-Making