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An Individual's Chosen Retirement Age: When Is the Economically Feasible Retirement Age Chosen Over the Anchor Provided by Known Others?

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Abstract

Do individuals make rational, well-planned retirement age decisions? Evidence is not conclusive; some decisions seem to be quite reasonable, while others, including the long-term trends generated by these decisions, seem irrational. In order to be able to predict and influence this important decision, the process leading up to it needs to be better understood. The process an individual uses to make a retirement decision may be influenced by a rational allocation of money, time, and effort, as suggested by a utility-maximizing Household Production approach. Alternatively, the decision process may be strongly influenced by an anchor, defined by the retirement ages chosen by friends, neighbors, relatives, and colleagues, as suggested by Anchoring and Prospect Theory. Studies investigating anchoring and risk-seeking/risk-aversion behavior, which results when a target is seen as a loss or a gain from the anchor, have found that individuals make irrational decisions under many different circumstances. A set of retirement decision propositions, which hypothesize that the heuristic of Anchoring and the resulting cognitive biases described by Prospect Theory will influence the chosen retirement age, are developed in this paper. Retirement information provided by the employer is a possible moderator that may reduce the influence of the anchor on the retirement decision; a set of moderator hypotheses are also developed in this paper. Propositions strongly supported by existing research predict that, unless sufficient information regarding retirement issues is used by an individual, s/he is likely to choose an inappropriate retirement age. Finally, recommended methods, including settings, variable measurement, and possible methods of data analysis, for completing the proposed study are provided.

Introduction

Retirement research has shown that individuals sometimes seem to make very rational, optimal decisions with regard to retirement and at other times to make irrational decisions that cannot be explained. For instance, in support of rational decisions, Kim and Feldman (2000) have found that individuals accepting bridge employment were strongly influenced by financial needs (lower personal savings and lower pension benefits) and good health. These authors' results also showed that individuals who previously declined early retirement programs and held onto their regular jobs were later strongly disinclined to accept bridge employment, thus implying that "decliners are holding onto their regular jobs until they can accumulate enough income to retire" (Kim and

Feldman, 2000, p.1207)—a truly rational decision. Also, as Anderson, Burkhauser, and Quinn (1986) found, a majority of employees retired when they planned to, and those who changed their plans were strongly influenced by unexpected financial changes (changes in Social Security and employer-provided pensions) and deterioration in health. Many statistics, however, also imply irrational decisions. For example, the retirement decisions have resulted in a trend of earlier and earlier retirement among men since the 1930s; in 1937, the labor force participation rate of men age 60 and over was 61.5%, but by 1990, this rate had steadily fallen to 27.6% (Levine and Mitchell, 1993). This long-term trend has occurred in spite of substantial increases in longevity and improvements in health care. Since the late 1980s, this trend has leveled out and become fairly stable but has not reversed; from 1988 to 1992, the percentage of individuals still working in the age 63 to 64 category increased slightly from 40.2% to 42.9%, while the percentage in the age 65 and over category decreased slightly from 15.2% to 13.7% (*EBRI,* 1995). Another example of a consequence of non-optimal decision making is reflected in the poverty level of retired individuals. Although the general economic status of the elderly has improved, many people, particularly women, live in poverty during their retirement years (*EBRI,* 1995; Rappaport, 2000). This trend is supported by current statistics that show that the percentage of individuals over the age of 65 who were still working dropped from 15.2% in 1988 to 13.7% in 1992, while the median income, adjusted to 1992 dollars, of individuals in the age-65-to-age-69 category dropped from $12,423 to $11,302, mostly due to decreases in median income from personal assets (*EBRI,* 1995). More workers continued to retire while the median income for this group from all sources except Social Security declined.

Why do some individuals make rational, optimal retirement decisions, and others make unreasonable, poor decisions? Although a great deal of research has been done on the influences on and consequences of retirement, no research has investigated the individual retirement decision-making process. Can we predict and then influence the age pattern of people withdrawing from their working careers and moving into retirement, without knowledge of the retirement-making process? This is unlikely, given our lack of understanding of when rational versus irrational influences affect this decision process and lack of understanding of what, if anything, moderates the influence of different factors on the retirement age chosen. Understanding individual decisions, and the relative influence of different factors on the choice of a retirement age, is thus very important. Technology is now available through interactive, Web-based surveys to investigate this decision-making process, including assessing the initial knowledge of individuals, recording the impact of feedback showing the

reasonableness or lack thereof of decisions to date, and recording choices made by individuals to improve their retirement planning or to avoid accepting a more optimal retirement age.

Although not used to date to study retirement decisions, important theories, which have been extensively used to investigate other areas of decision making, do exist that can be used to analyze the retirement decision-making process. Two distinct theories, Theory of Bounded Rationality and Prospect Theory with Anchoring, suggest quite different influences and procedures when making a retirement decision. Economic approaches based on Bounded Rationality have been used for almost four decades to study individual behavior (Becker, 1976; Ierulli, Glaeser, and Tommasi, 1995); the retirement decision using Becker's (1976) rational economic theory emphasizing allocation of scarce resources of money, time, and health is described and appropriate hypotheses generated in an earlier paper (Brothers, 2000).

Contrary to Bounded Rationality, Anchoring and Prospect Theory along with several other cognitive biases uncovered by decision-making researchers, indicate that humans are often not rational beings (Kahneman and Tversky, 1979; Bazerman, 1998; Kuhberger, Schulte-Mecklenbeck, and Perner, 1999; Levin, Schneider, and Gaeth, 1998). Anchoring and accompanying cognitive biases will likely influence an individual's choice of a retirement age; this choice will also likely be different from the economically-appropriate retirement age based on allocation of scarce resources for several reasons. First, a decision maker facing a retirement decision will have knowledge of the chosen retirement ages of many other people with whom s/he compares her/himself, including family members, peers with whom s/he works, and neighbors. The retirement ages of these known comparable others, as explained by the activation mechanism, will very likely form an anchor (Chapman and Johnson, 1999). The individual decision maker will view this anchor as a neutral reference point from which to analyze the retirement decision and assist with the choice of his/her retirement age. Contrary to utility and expected value theories, Prospect Theory indicates that an individual will analyze his/her retirement decision by viewing potential outcomes, his/her retirement age in this case, as a gain or loss relative to the anchor (Kahneman and Tversky, 1979). Potential gains and losses will be treated differently by the decision maker, where possible losses, especially when very likely or if the payoff at risk is large, will induce the decision maker to be a risk seeker (Bazerman, 1998; Kuhberger, et al, 1999; Levin, et al, 1998; Kaufman, 1999). The individual choosing his/her retirement age will likely view an age later than that chosen by known others as a loss. As a result, the decision maker

will likely not adjust his/her retirement age far from the anchor, instead accepting unknown future financial risks.

As many researchers have found, several other cognitive biases will also likely exacerbate the illogical decision-making approach suggested by Anchoring and Prospect Theory. For example, humans are notoriously disinclined to use expert systems, including actuarial calculations, when making decisions (Kleinmuntz, 1990; Dawes, Faust, and Meehl, 1989). Also, most individuals use simplifying heuristics when the decision to be made is complex or when it necessitates using multiple sources of information (Bazerman, 1998; Hogarth, 1980). Certainly, an economically-based retirement decision that involves allocation of the scarce resources of money, time, and health necessitates use of actuarial methods to make appropriate financial allocations and necessitates use of multiple sources of information that include both quantitative and qualitative data on time and health considerations. The question is whether individuals use actuarial calculations and multiple sources of information to analyze such a major life decision as the choice of a retirement age; prior research suggests they will not. Consequently, it seems very likely that cognitive biases, especially Anchoring and risk-seeking behavior described by Prospect Theory, will strongly influence an individual's retirement decision. The result will be an inappropriate choice, from an economically rational perspective, of a retirement age.

What, if anything, can reduce the influence of the anchor on the retirement decision and encourage an individual to focus on the rational influences: money, time, and health? Current research has found that employer communication improves both understanding and satisfaction with benefits (Broderick and Gerhart, 1997; Gerhart and Milkovich, 1992; Hennessey, Perrewe, and Hochwarter, 1992; Sturman and Boudreau,1994; Barber, Dunham, and Formisano, 1992). Although this research has investigated the effect of communication on health and flexible benefit plans only, it seems reasonable to assume that more communication about retirement benefits will also improve employees' satisfaction and understanding of this expensive, important group of benefits. Also, although anchoring effects are very robust, their influence has been shown to be reduced either when the participant is prompted to consider reasons why the anchor is not appropriate or when the participant is more knowledgeable about the dependent variable or the decision process (Mussweiler, Strack, and Pfeffer, 2000; Chapman and Johnson, 1999; Wilson, Houston, Etling, and Brekke, 1996; Neale and Northcraft, 1986). Communication of retirement information should lead to more knowledgeable employees and provide information that allows them to distinguish anchored retirement ages

from their own target retirement ages. Increases in employer communication about retirement benefits is being strongly encouraged by investment advisors, consultants, researchers, and the government (Burzawa, 2001; Rappaport, 2000; *Employee Benefit Plan Review,*1999; Feldman, 1994). It seems likely that this group is right; more information on retirement benefits may substantially reduce or even negate the influence of the anchor.

A study of employees' decision-making processes and their actual retirement decisions will provide valuable information about both the influences of rational allocation of time, money, and effort, and the influences of Anchoring and its consequent irrational risk-seeking/risk-aversion behavior on the choice of a retirement age. This study will extend the decision-making literature by a) investigating the anchoring and adjustment process for a real-world, major life decision and b) investigating a decision maker's creation of an anchor without information provided by the researcher. Management literature will be extended through additional information about a) employees' knowledge or lack thereof about their retirement benefits, both defined benefit and defined contribution, b) the influence of employer communication, and c) the influence of anchors and irrational risk-seeking behavior on the retirement decision. Such a study can also have important managerial and public policy applications. Both theories can be used by organizations to address and influence behavior, though through very different techniques and approaches. Bounded Rationality has long been used by management to influence employee decisions and behavior through financial incentives or penalties. Alternatively, Anchoring and Prospect Theory imply employees can be influenced through changes in the anchor ages of known others or more quickly, by discouraging the formation of anchoring influences through the communication of more and better information on retirement issues. Thus, for instance, to encourage later retirement, an employer can provide information to employees that allow them to investigate their financial needs as compared to available benefits; this will likely show them that they need to increase their chosen retirement ages and/or need to increase personal savings in IRAs and/or in 401(k) employer-sponsored plans. To encourage later retirement for all through change in retirement anchors, an employer must strongly encourage some employees, such as managers, to retire later, must make the decisions of those who do retire later very public and noticeable, and must wait for this new information to be included in employees' anchors. Knowledge of the decision-making process would certainly be beneficial with regard to public policy, redesign of Social Security and Medicare system as well.

The purpose of the proposed research is to investigate the retirement

decision, including the age chosen, influencing factors, and potential moderating factors. The unit of analysis will be individual members of an organization or association. This study should investigate both rational and irrational influences on decision-making behavior using hierarchical regression analyses. If research shows that, as expected, employees/individuals take irrational risks to support an anchor-based retirement age, then employers and the government will know that more information on retirement issues needs to be communicated in order to encourage individuals to focus less on the anchor and more on the rational influences: money, time, and health.

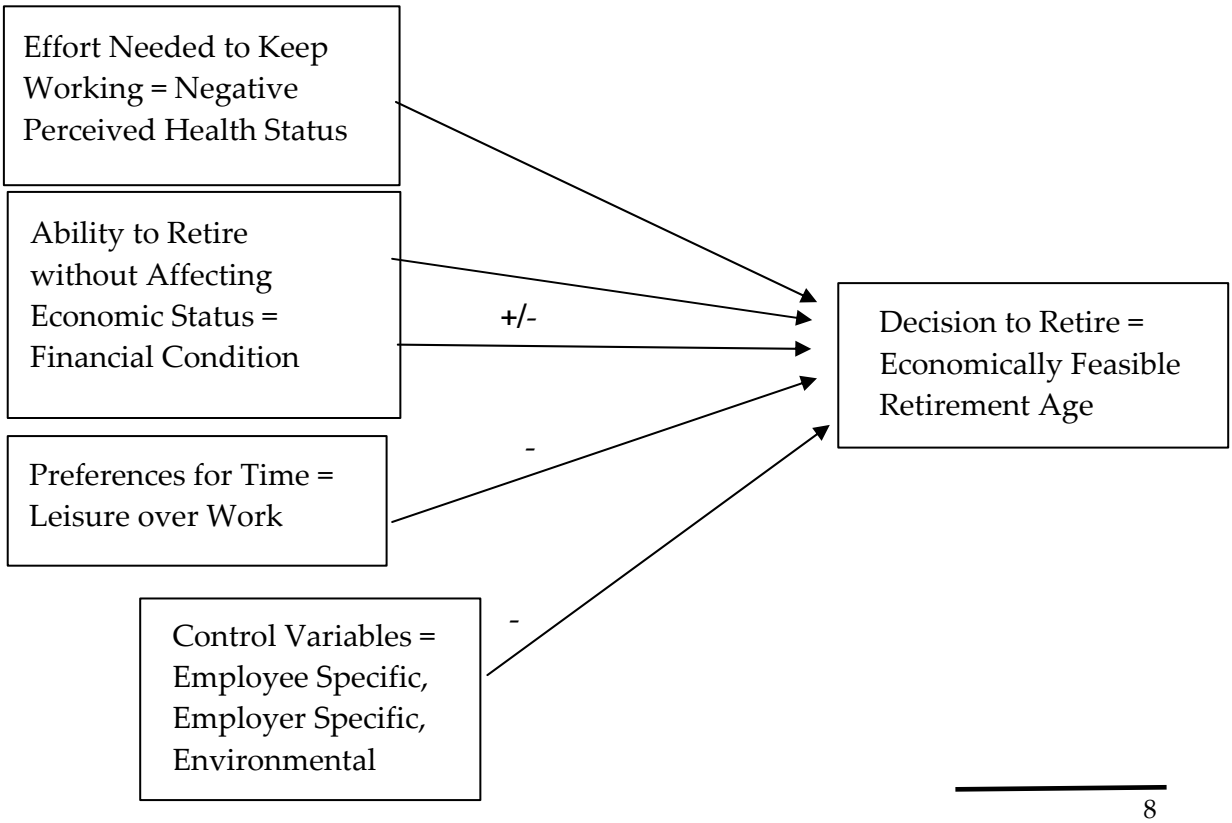
Development of Hypotheses for Future Research

Every individual makes many choices each day, choices between different personal activities, choices regarding work activities, choices about meals, etc. Individuals also occasionally make major life decisions, such as the decision to retire or to pursue additional education instead of immediate employment. Do individuals make rational choices and consider their specific circumstances when making retirement decisions (Becker, 1976; Ierulli, et al, 1995)? Alternatively, is the amount of information and uncertainty associated with a major life decision such as retirement overwhelming, thus leading individuals to use heuristics and framing references to make poor, non-optimal decisions (Bazerman,1998; McKean,1985; Tversky and Kahneman, 1981)? Is there any mechanism, a moderator, that encourages an individual to be more rational, optimizing, with regard to a retirement decision? Hypotheses to investigate each of these questions are generated below. For purposes of the following propositions, the definition of "retirement" will be the age of the individual when the first retirement benefit is paid to him or her. "Retirement" may be defined by several different triggering events, including being employed less than full time (known as partial or phased retirement), receiving a pension benefit, forced or "implied" mandatory retirement, early (prior to age 65) as compared to normal retirement, and assumption of the person that they are "retired" (Levine and Mitchell 1993; Beehr,1986). The definition used for this study has been chosen because it a) represents the economic point when the individual begins to reduce rather than accumulate assets for retirement and is thus a good defining point for the rational hypotheses and b) is consistent with the definition used by other researchers who refer to bridge employment as post-retirement employment (Kim and Feldman 2000).

Economically-Based Propositions

Economists, including labor economists, have studied individual decision making from the perspective of utility-maximizing, rational choice models (Anderson, et al,1986). In particular, research on retirement issues has been based on Human Capital Theory and Agency Theory (Ben-Porath,1967; Mincer, 1994; Lazear, 1979, 1995). Such research has considered only one component influencing the individual decision, financial considerations; the influence of health considerations and individual preference for time have not been considered. To consider all personal elements that influence the retirement decision, it is necessary to return to the basic premises outlined by Becker and colleagues in the 1960s — consider the scarce resources that constrain an individual's choices and that must be allocated each time someone makes a major decision, namely money, time, and effort (Ierulli, et al, 1995). The derivation of hypotheses that reflect the impact of each of these resources — time, money, and health — on the choice of an economically feasible retirement age is contained in a previous paper (Brothers, 2000). The resulting full proposition 1 derived in that paper is as follows:

1 c) *When an individual has the ability to retire without affecting his/her economic status, the employee will choose an earlier retirement age if either a) s/he perceives s/he is unable to keep working or b) s/he prefers spending time on leisure instead of work activities or c) both.*



Propositions Explaining Non-optimal Decisions Derived from Anchors

For several reasons, it is very unlikely that an individual's chosen retirement age will actually be equal to his/her economically feasible retirement age. First, the economically feasible retirement age is based on complex actuarial calculations related to financial conditions, health conditions, and time preferences. It is very unlikely that an individual would actually perform or have performed such calculations for him/herself. Humans are notoriously disinclined to use expert systems when making decisions, even when the decision maker is making a decision in his/her own chosen profession and the systems have been well tested and proven more effective than human intuition (Kleinmuntz, 1990; Dawes, et al, 1989; Peterson and Pitz, 1986). Also, having such an in-depth analysis done by an expert is very costly and thus outside the decision-making framework for most individuals. Second, most individuals use simplifying heuristics to make decisions especially when the decision to be made is complex or when it necessitates using multiple sources of information (Payne, Bettman, and Johnson, 1992; Bazerman, 1998; Hogarth, 1980). Since determination of the economically feasible retirement age is high on complexity, volume of information, and mix of numerical with descriptive health and time data, it is very likely that an individual would use a simplifying heuristic to make such a decision. As has been well documented by researchers, use of heuristics often results in inappropriate cognitive biases and thus inappropriate outcomes. In this case, cognitive biases likely result in inappropriate selection of a retirement age.

If an individual does not or cannot determine his/her economically feasible retirement age, how does s/he arrive at a chosen retirement age? Each individual has knowledge of the chosen retirement ages of many other people, including family members, peers with whom each has worked, and supervisors and managers in the firms where s/he has worked. This available information can easily form an anchor for the individual. In particular, a person can compare him/herself to peers and neighbors, assessing the similarities in job position and thus wages, in living standard via automobiles, homes, travel, etc., and in health. These similarities will lead to an association-based error when the individual considers his/her own retirement age, his/her own "target" (Chapman and Johnson, 1999). This process is referred to as the activation account of the anchoring-and-adjustment bias. Specifically, researchers have found that

anchoring can occur because the decision maker attends to target features that are similar to the anchor (Mussweiler, et al, 2000; Chapman and Johnson,1999; Schkade and Johnson, 1989). This activation mechanism is a fairly automatic cognitive process that is enhanced when multiple features of the target exist so that similarities between the target and the anchor can be readily found. Certainly, an individual can find many ways to equate him/herself (the target) with peers and neighbors. There is an endless supply of similarities, career- and job-related as well as financial- and family-related, and, as research on the activation process supports, focusing on these similarities, especially considering similarities first, encourages the decision maker to neglect and likely not make the extra effort to search for dissimilarities (Chapman and Johnson, 1999; Hoch, 1984).

Research has also shown that, once an anchor is set, it is easy to support and very difficult to reduce its influence on the target (Mussweiler, et al, 2000; Chapman and Johnson, 1999). When making a decision, focus on similarities with peers and neighbors will be supported by the person's overconfidence that s/he has chosen an appropriate retirement age; for instance, the individual is likely to believe that s/he works as hard, has as much or more job responsibilities than peers, and thus is entitled to the same retirement scenario. Also, as supported by research, the individual will proceed to confirm the already existing bias by continuing to notice similarities between him/herself and known friends, relatives, and neighbors as they proceed to retire (Chapman and Johnson, 1999; Hoch, 1984). In addition, researchers have found that it is very difficult to correct the categorization of information stored in memory to "false" once it has been understood by an individual, even when the information was presented as questionable when it was communicated; in other words, we tend to accept information as true at the time it is presented (Gilbert, Krull, and Malone, 1990). Thus, if an individual discovers that assumed similarities with neighbors with regard to financial position is not accurate, it will be very difficult for him/her to correct his/her memory regarding the former information. Consequently, an individual is unlikely to consider, search for, or believe differences, even important financial differences such as rate of savings or difference in employer-provided benefits, between him/herself and known assumed-similar others.

The anchor representing known others' chosen retirement ages will have a moderating effect on the individual's future analysis of the retirement decision, as well as the direct effect on the chosen retirement age just described. Prospect Theory, described and researched by Kahneman and Tversky (1979, 1992), states

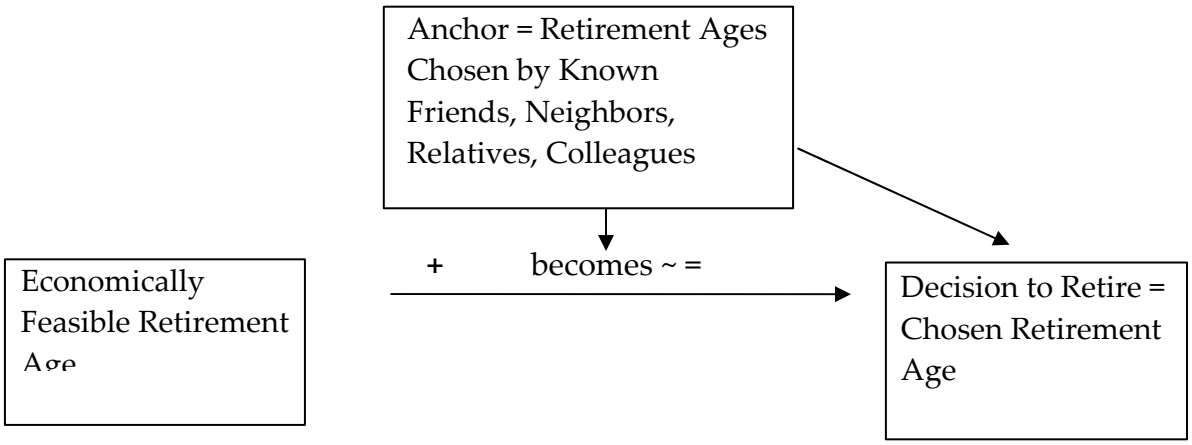
that potential outcomes are expressed as gains or losses relative to a fixed, neutral reference point; the reference point is the initial anchor or starting point of the decision process. When the potential outcome for this study, the individual's economically-feasible retirement age, is compared to the anchor, the chosen retirement age of known others, the future retiree will view the difference as either a gain or a loss. Contrary to Utility and Expected Value Theories, substantial research on Prospect Theory has shown that gains and losses are treated differently (Bazerman, 1998; McKean, 1985; Kuhberger, et al, 1999; Levin, et al, 1998). A decision maker will avoid a risk if the change from the anchor to outcome is seen as a gain, but will be a risk seeker, selecting the risky choice when given an option between a risky and certain solution, when the change from the anchor to outcome is seen as a loss. This dichotomy, the moderating effect of the anchor on the decision maker's final choice, has been shown to hold in many different circumstances and for all types of decision makers (Kuhberger, et al, 1999). Recent researchers have also found that the strength of this dichotomy differs depending on the type of good involved; when there is a perceived loss, individuals are willing to take higher risks when making choices concerning human lives or diseases than when making choices about property or monetary issues (Kuhberger, et al, 1999; Levin, et al, 1998).

If the individual's chosen retirement age based on his/her anchor and the economically-feasible retirement age are unequal, how does the person reconcile the difference and set a retirement age? As implied by Prospect Theory, the decision maker's self-generated anchor will be compared to the economically-feasible retirement age; the decision maker will then view the difference as either a gain or as a loss. If the comparison between these two ages indicates to the decision maker that s/he has adequate funds to retire by the time known others have retired, in other words if the anchor age is higher than the economically-feasible retirement age, then the individual will view this as a gain. The person will feel that s/he is able to enjoy the same benefits, retirement financial security and leisure time alternatives, as other neighbors, colleagues, friends, and family members to whom the person compares him/herself. In this case, the final choice of a retirement age will be easy; the individual will leave the chosen age as is. This assumption is well supported by existing research that has found that decision makers are consistently risk averse when the situation is framed or perceived as a gain (Kuhberger, et al, 1999; Bazerman, 1998; McKean, 1985). In fact, as explained by the mood-maintenance hypothesis, an individual has been shown to be more risk averse with regard to a potential gain when s/he is in a positive mood than when in a negative mood (Mittell and Ross, 1998). The decision maker will likely be in a good mood, positive affective state, following

the realization that s/he is able to retire, with financial security, by the same age as known others; thus, the person's level of risk aversion will be high. S/he will not want to risk future retirement security by choosing an earlier retirement age, the economically feasible retirement age; instead s/he will consider the additional income that will exist at the later age to be available for contingencies, such as health costs, or to enhance his/her standard of living in retirement. Selecting an earlier than planned retirement age would likely also violate the decision maker's choices with regard to expenditure of time; s/he may enjoy work- and career-related activities and/or may not have activities planned for earlier retirement.

Consequently, a future retiree whose self-generated anchor is greater than the economically-feasible retirement age will leave his/her chosen retirement age as is. Due to risk aversion, s/he will not reduce this chosen age to the economically-feasible retirement age. Thus, proposition 2 part a) is as follows:

2 a) *An individual's chosen retirement age will seldom be equal to his/her economically feasible retirement age. The anchor of retirement ages chosen by friends, neighbors, relatives, and known colleagues will moderate the relationship between the economically feasible retirement age and the individual's chosen retirement age. When the anchor is greater than the economically feasible retirement age, the individual will view this as a gain and will retain the chosen retirement age.*



Unlike the case when the anchor age is greater than the economically-feasible retirement age, if the anchor age is less than the economically-feasible retirement age, the decision maker will view this as a loss. The comparison will be viewed as a loss because the individual will feel that s/he will not be able to enjoy the same retirement benefits as other neighbors, colleagues, friends, and family members whom the individual views as similar. At this point in the decision process, the individual will feel that the general choices seem to be either to accept a financially secure retirement at an age later than desired, thus foregoing the person's preferences for leisure time, or to retire at the age desired and face possible financial insecurity during retirement. Both of these options will be perceived as losses. Although decision makers are not consistently risk seekers when the situation is framed as a loss, comparison of the anchor to the economically-feasible retirement age in this case, people are consistent when both the frame and the actual final outcome are losses (Kuhberger, et al, 1999). Since both general options will be seen as future losses to the individual, this situation will likely be seen as both a framed and an actual loss. Also, the decision maker's risk-seeking behavior will be enhanced by the negative mood created by the feeling of pending personal loss, loss of personal choice of a retirement age, and loss of benefits equivalent to those experienced by others with whom the decision maker compares him/herself. As explained by the mood-maintenance hypothesis, individuals in a negative mood will take higher risks than those in a positive mood, especially when the issue is framed as a potential loss (Mittell and Ross, 1998). This loss perception will encourage the decision maker to be a risk seeker and thus to risk future financial insecurity by leaving his/her retirement age at the original chosen age (Bazerman, 1998; Kuhberger, et al, 1999; Levin, et al, 1998). This resistance to increasing the chosen retirement age will be great if the individual has a strong preference to spend time on non-work-related activities and/or feels that s/he will not be healthy enough to continue working to the later age.

The decision maker's choice to not increase his/her chosen retirement age will be supported by several human weaknesses, in addition to risk-seeking behavior. Specifically, individuals are not inclined to rely on actuarial models or calculations when making decisions, not even professional decision-makers where the models have been well tested and shown to produce more accurate predictions than human intuition (Kleinmuntz, 1990; Dawes, et al, 1989; Peterson and Pitz, 1986). Research conducted on all forms of decision aids have consistently concluded that decision makers, both experienced and inexperienced in the field on which the decision is being made, will not likely allow important decisions to be based solely on the output of a mechanical

method (Peterson and Pitz, 1986; Dawes, et al, 1989). The decision maker will almost always retain the power to make the final decision, since s/he is confident that the model does not have full information and/or cannot combine multiple sources of information as well as a "knowledgeable" individual (Kleinmuntz, 1990). However, individual intervention through modification of predictions made by actuarial models seldom produces accurate forecasts; research shows that inclusion of input from the decision maker does not increase the accuracy or the utility of a prediction, and can easily do more harm than good (Dawes, et al, 1989). Skepticism about actuarial calculations and personal overconfidence that the decision maker has more information and can combine it more accurately than a mechanical model will likely be great with the retirement age decision. This decision is based on three major personal characteristics of the decision maker, and valuations of two of these dimensions, health and time preference, depend on subjective personal assessments. Thus, the decision maker will likely distrust the actuarially determined economically-feasible retirement age, since s/he will feel that this calculation does not adequately consider unique factors about him/herself and/or will feel that s/he can improve the statistical calculation.

In further support of individuals' risk-seeking behavior, people have been found to be unwilling to reduce current consumption levels even when they know they are facing future reductions in income (Bowman, Minehart, and Rabin, 1999). These authors described a two-period consumption/savings model based on Tversky and Kahneman's Prospect Theory, hypothesizing that there is an asymmetry in the evaluation of future increases versus future decreases in consumption. Specifically, they hypothesized that when an individual receives good news about future income prospects, s/he may immediately adjust current consumption upward, thus leaving minimal funds for further increases in consumption, but, if bad news is received implying a negative future impact on income, risk-seeking behavior will encourage him/her to not adjust current consumption and instead delay the decrease in future consumption to the date when the negative shock is realized, if ever (Bowman, et al, 1999). Shea (1995) found evidence of such asymmetric consumption behavior by analyzing union contracts in the U.S.; he found that, during the second period, consumption responded more to first-period-predictable declines in wages than to first-period-predictable increases. Bowman, et al (1999) extended Shea's research by finding evidence supporting their asymmetric model using per-capita consumption and personal disposable income of Canada, France, West Germany, and the United Kingdom and of a pooled group including these four countries plus Japan and the U.S.; they found significantly larger, future-period consumption responses to predictable declines in income than to predictable income growth. Thus, with

regard to the current retirement decision, a participant will likely be unwilling either to forgo current income and consumption in order to increase savings for retirement or to increase the chosen retirement age. The risk-loving individual as described by the two-period consumption/savings model will defer this uncertain loss to the date it actually occurs, if at all, during retirement. Thus, the second proposition, part b) is as follows:

2 b) *When the anchor is less than the economically feasible retirement age, an individual will view this as a loss and will not be willing to increase the chosen retirement age to be equal to the economically feasible retirement age. The individual will also be unwilling to increase his/her personal savings so that the economically feasible retirement age can be reduced to the chosen retirement age.*

Decision makers are not consistent risk seekers when the task is framed as a loss. Risk-seeking propensity differs depending on whether the final outcome will be a loss, on the probability of loss, on the size of the payoff, and on the type of good at stake (Kuhberger, et al, 1999). The decision to retain the chosen retirement age when the economically-feasible retirement age is greater than the anchor age contains several different types and differing levels of risk due to the fact that the economically-feasible retirement age is based on the allocation of three scarce resources: money, time, and effort (Ierulli, et al, 1995). Since time is strictly a preference issue that assesses whether an individual wishes to spend time on work versus leisure and family activities, no real risk is involved with this component. Also, the individual's time preference will have been taken into account in determination of the chosen retirement age as well as the economically-feasible retirement age; thus, adjustment for this resource should not be needed. With regard to the financial/monetary component, however, significant risk and uncertainty is involved. Several financial elements are fixed or are outside the control of the individual decision maker; this includes the Social Security benefit and many employer-provided retirement benefit(s). The financial components provided by participation in an employer's 401(k) plan and by the individual decision maker's IRA and other personal assets are, however, quite flexible and under direct control of the decision maker through choices in rate of savings and types of investment. As previously explained, the decision maker is not likely to increase his/her savings rate due to the person's resistance to consuming below his/her current reference point as supported by the two-period consumption/savings model of Bowman, et al, (1999). However, the decision maker can change his/her investment strategy to a more risky combination of investments and, by doing so, hopefully produce a higher rate of

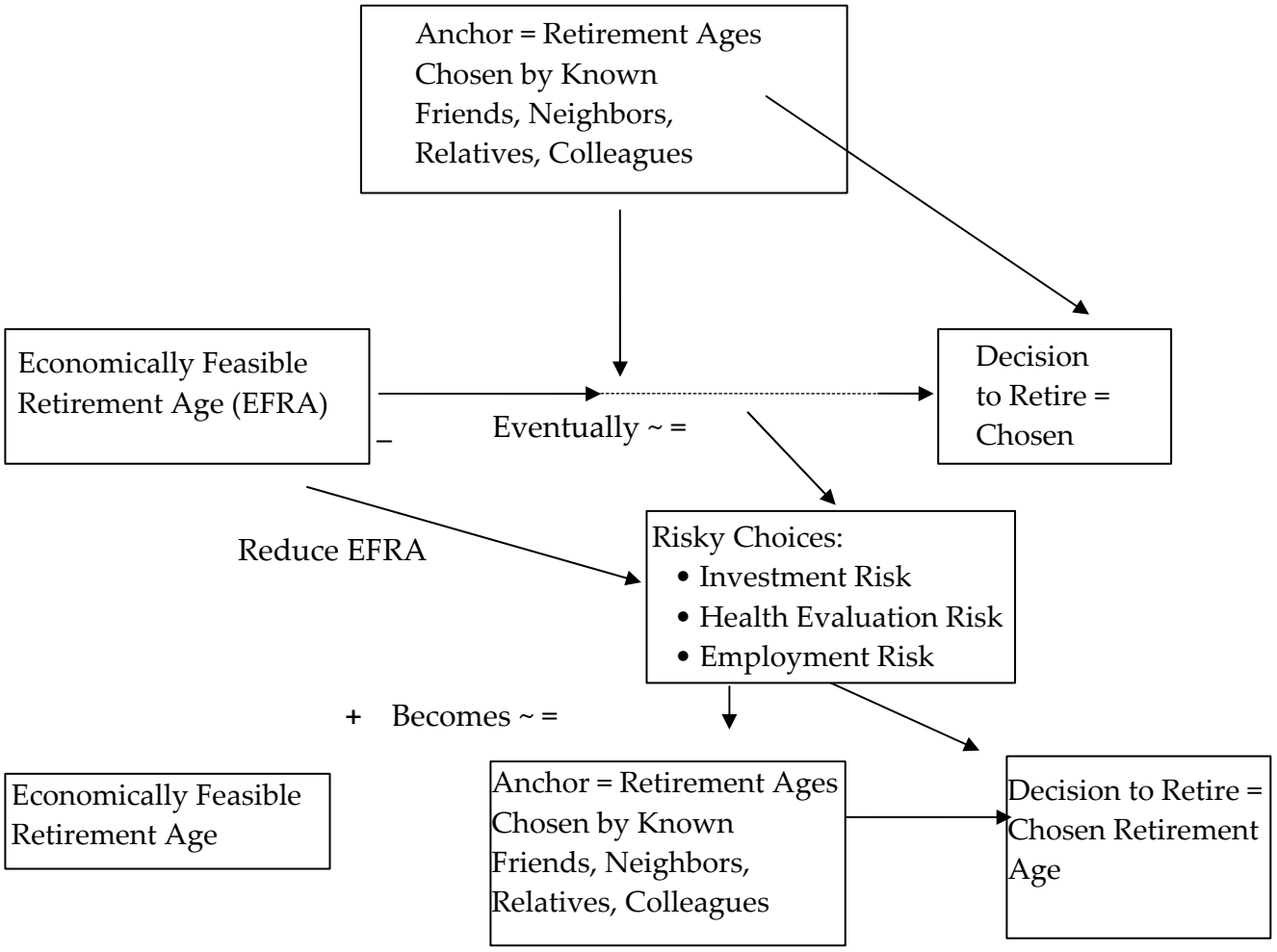
return and have more funds available at his/her chosen retirement age. The decision maker will likely be a risk seeker in this situation and will choose more risky investments than s/he otherwise would. This is supported by Prospect Theory and recent research since, as explained before, the decision maker will view this situation as both a framed and a true loss (Bazerman, 1998; Kuhberger, et al, 1999). This risk-seeking propensity will not be constant, however. The greater the difference between the economically-feasible retirement age and the anchor age, the greater will be the increase in the riskiness of the decision maker's investment choices; this is supported by research that has found that risk-seeking propensity increases as the probability of loss increases and/or as the size of the payoff increases (Kuhberger, et al, 1999).

With regard to the third scarce resource, effort and perceived health considerations, substantial uncertainty and risk exists with this component. The decision maker's expected longevity and thus length of retirement are based on current mortality tables that are used by insurance companies and consulting actuaries to determine the cost of a retirement annuity, as adjusted by the decision maker's own assessment of his/her perceived health status. However, these calculations determine only the "expected longevity and length of retirement"; the actual length of retirement cannot be determined until after the decision maker dies. An individual facing a framed and likely true loss will be inclined to question this very uncertain component, the stated longevity figure, for several reasons. First, as previously discussed, individuals are not inclined to use actuarial models or calculations when making decisions, not even when the calculations have been well tested and shown to produce more accurate predictions than human intuition (Kleinmuntz, 1990; Dawes, et al, 1989; Peterson and Pitz, 1986). Although the decision maker will likely be willing to incorporate the actuarial prediction of longevity in his/her assessment, s/he will want to make the final decision since s/he will certainly feel that the expected calculation does not consider full information about his/her specific health. Second, decision makers are risk seekers when facing losses; they will choose a risky option that might reduce the loss instead of simply accepting a smaller sure loss (Bazerman, 1998; Levin, et al, 1998; Kuhberger, et al, 1999). Third, researchers have found that a higher percentage of decision makers make risky choices regarding decisions concerning human lives and diseases than they do regarding decisions about property and money (Levin, et al, 1998; Kuhberger, et al, 1999). It has been suggested that this difference in risk-taking propensity is due to the context that makes people think more normatively than they do with financial decisions that encourage statistical thinking (Kuhberger, et al, 1999). Thus, when considering the longevity calculation and length of retirement, the decision maker is very

likely to be a risk seeker. Due to discomfort with the longevity calculation and a risk-seeking propensity, the decision maker will be likely to indicate that s/he expects her/his own personal longevity to be less than the expected value. This risky choice can very likely cause future financial insecurity for the individual at the time s/he purchases an annuity or after retirement when s/he actually does live the expected number of years or longer, but it will justify the decision maker's chosen retirement age in the present and thus alleviate or eliminate his/her present feeling of loss of retirement benefits.

The decision maker does have another option to consider if the now-adjusted economically-feasible retirement age is still greater than the anchor age. Specifically, the decision maker can decide to retire at the chosen retirement age and, if financially necessary, return to work after retirement or accept bridge employment. This decision is financially risky, however. The individual may not be able to return to work after retirement or accept bridge employment because of poor health in later life or may not be able to secure employment after retirement due to lack of skills based on both rapid changes in skill requirements since retirement and diminished physical or mental ability. This supposition is partially supported by recent research. Kim and Feldman (2000) investigated the antecedents of acceptance of bridge employment; they found that the strongest positive influences on acceptance were good health, a working spouse, dependent children, and lower levels of pre-retirement salary as a surrogate for personal savings. Thus, depending on future acceptance of bridge or post-retirement employment and thus assuming that income from this source will offset low pension benefits on retirement can be very risky and uncertain. However, consistent with risk-seeking behavior of decision makers who are facing losses, an individual who is still facing a choice between two possible losses, where one option is to increase his/her chosen retirement age to the now-adjusted economically-feasible retirement age and the other is for the individual to retain his/her lower, chosen retirement age and plan to return to work if financially necessary, will likely choose the second, financially risky option (Bazerman, 1998; Levin, et al, 1998; Kuhberger, et al, 1999). Thus, the resulting full proposition 2 is as follows:

2 c) *When the anchor is less than the economically feasible retirement age, an individual is willing to take additional risk in order to avoid increasing the chosen retirement age. First, s/he will be willing to put personal savings in higher risk investments in order to potentially reduce the economically-feasible retirement age. Second, the individual will support/anticipate a more pessimistic assumption with regard to future health and longevity in order to reduce the economically-feasible retirement age. Third, s/he will be willing to anticipate part-time post-retirement employment to earn wages that allows the chosen retirement age to become economically-feasible. When the anchor is greater than the economically feasible retirement age, as hypothesized by 2a), the individual will view this as a gain and will retain the chosen retirement age.*



Influence of Communication Provided by Employer

Can anything remove or reduce the impact of the anchor, the chosen retirement ages of known friends, relatives, colleagues, and neighbors? Employer communication, which has been shown to increase both understanding and satisfaction with employee benefits (Broderick and Gerhart, 1997; Gerhart and Milkovich, 1992; Feldman, 1994), is one possible way to reduce and possibly negate the influence of the anchor. With regard to retirement benefits, employer communication will likely include retirement statements that show current account values and projections of annuity values, information about investment choices, and comprehensive preretirement counseling programs that cover legal, social, physical wellness, and financial aspects of retirement (Feldman, 1994). For instance, Strong Investments makes seven different modules available to their clients for use by employees; these modules include plan basics, asset allocation, how to reach a comfortable retirement, and market and fund risk information and analysis (Burzawa, 2001). Aetna Financial Services provides reports on self-assessment for risk tolerance, fund analysis, and access to *Pathfinder,* an online tool that charts users' financial future (Burzawa, 2001). Consultants encourage communication to employees on retirement plan details to address the potential mismatch between needs and what is provided and/or to encourage retirement satisfaction (Rappaport, 2000; Feldman, 1994). Employer communication regarding retirement benefits, specifically the relative value of different forms of payment, is being investigated, and best practices are likely to be encouraged by the Internal Revenue Service and Department of Labor (*Employee Benefit Plan Review* 1999). All such communication will provide information to each employee about his/her Financial Condition and possibly Preference for Time, two of the three components that determine the economically feasible retirement age. By providing information about and thus improving understanding of these components of a retirement decision, each employee's chosen retirement age should be better aligned with his/her economically-feasible retirement age.

Although limited in number, some current research has found that employer communication improves both understanding and satisfaction with benefits (Broderick and Gerhart, 1997; Gerhart and Milkovich, 1992). Employee awareness about and satisfaction with 25 components of an extensive benefits package, which included a retirement plan and retirement counseling, available to employees of a U.S. state government agency were shown to increase with changes in communication brought about due to changes in plan design (Hennessey, et al, 1992). Benefit satisfaction was found to increase with improved coverage and decrease with greater employee costs, with both relationships

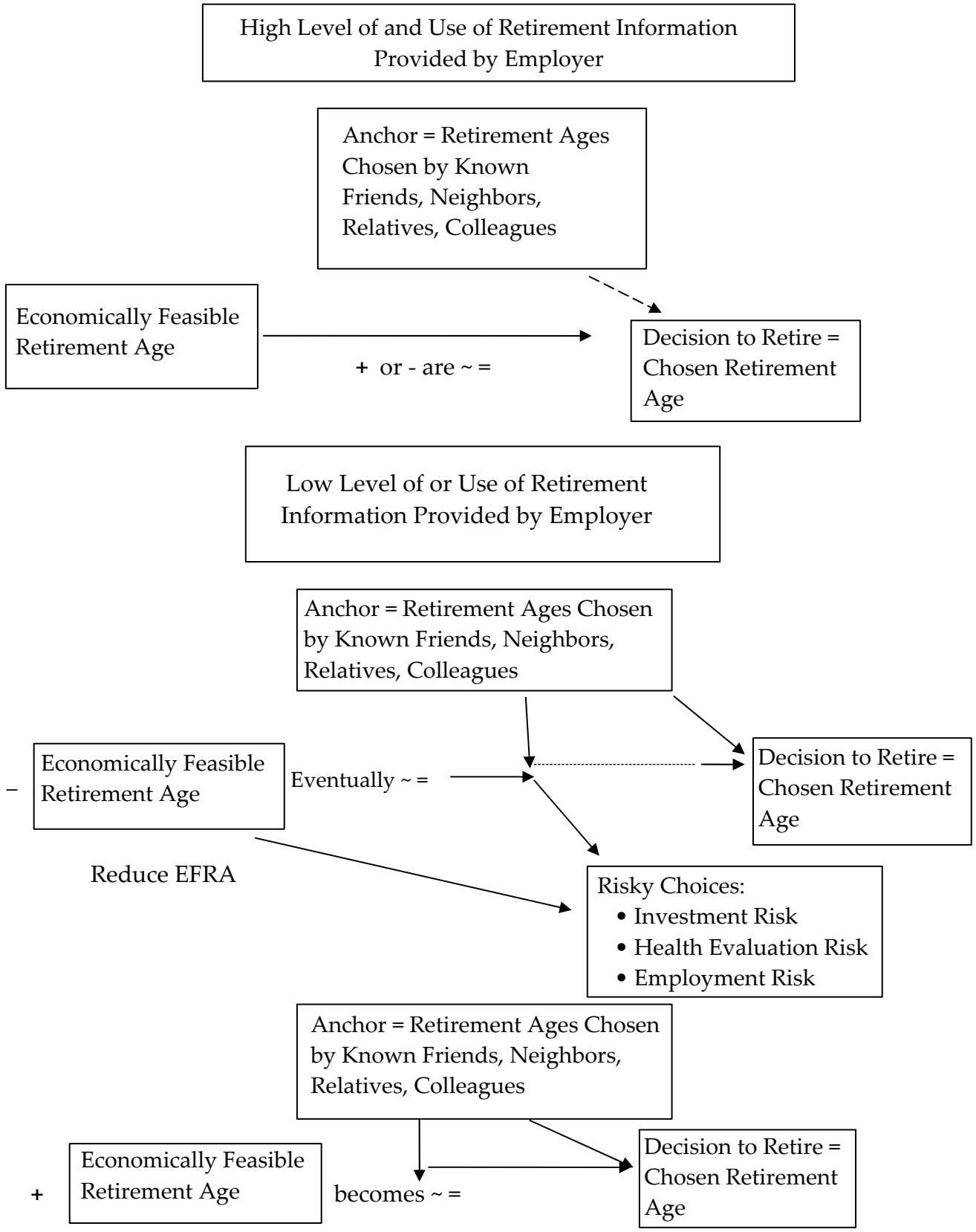
found to be stronger among employees possessing more accurate information (Dreher, Ash, and Bretz, 1988). Employee understanding of and satisfaction with benefits have been shown to increase significantly after implementation of a flexible benefits plan (Sturman and Boudreau, 1994; Barber, et al, 1992); although untested, these increases in understanding and satisfaction were likely due to additional benefit communication and training that accompanied the changes to the flexible benefits plans (Gerhart and Milkovich, 1992). Increases in employee satisfaction and understanding of health benefit options and their value have also been found following employees' use of expert systems to assist with making flexible benefit decisions (Hannon, Milkovich, and Sturman, 1990). Although the effect of increases in communication on increases in understanding and satisfaction has only been implied in most of the above studies and although only one of the above studies investigated the affect on understanding of retirement plans, the implication that increases in communication on retirement issues will improve understanding of retirement benefits and the economically feasible retirement age is still strong (Feldman, 1994). As Lawler (1981) suggests, any action that would enhance employee knowledge would strengthen the impact of benefits on employee attitudes and behavior.

Although anchoring effects are very robust, research has shown that their influence can be reduced under certain conditions. Use of randomly chosen and uninformative anchors still produce substantial anchoring effects (Wilson, et al, 1996; Chapman and Johnson, 1999), even when explicit instructions to correct for the anchor's likely influence are provided (Wilson, et al, 1996). Even when the anchor provided is extremely high or low, anchor effects still occur, though they are not proportional to the high or low extreme values (Chapman and Johnson, 1994; Strack and Mussweiler, 1997). Conflicting results have been found for the influence of participant motivation on anchoring. Wilson, et al. (1996) found that offering individuals a monetary incentive did not affect the magnitude of the anchoring influence, though participants said it had; Wright and Anderson (1989), however, found significantly less anchoring used by participants who were offered a relatively higher incentive. Three specific practices, all of which emphasize facts about the target (chosen retirement age for this study) that are incompatible with or in addition to information about the anchor, have been consistently found to reduce the influence of an anchor. First, when the anchor and target values are presented in different formats (i.e., one in dollars and the other as a percentage), the influence of the anchor is significantly reduced (Chapman and Johnson, 1994). Second, when the participant is prompted to consider reasons why the anchor is not appropriate, is not consistent with the target, the anchor's influence is significantly reduced or eliminated (Mussweiler,

et al, 2000; Chapman and Johnson, 1999). In fact, the higher the number of inconsistent features between anchor and target that are considered, the stronger the debiasing effect. Third, knowledge has been found to reduce the anchor's influence. Wilson, et al (1996) found that participants who stated they had more knowledge about the dependent variable showed significantly lower effects of anchoring. Neale and Northcraft (1986) found that, although experts still exhibited anchoring effects, the experts with process knowledge performed significantly better than amateurs. In another investigation of both experts and amateurs, Northcraft and Neale (1987) also found that decisions of both groups of participants were significantly affected by anchoring; although untested by the authors, the range of property values and the range of errors from the actual property listing price were much smaller for the experts.

As Arkes (1991) recommends, addressing the mechanism that produces the anchor will likely reduce the influence of the anchor. It thus seems likely that increasing the knowledge/expertise of employees by providing additional information on retirement issues should a) encourage them to use this target specific information, b) encourage the consideration of reasons why the target and anchor are dissimilar, and thus c) lead to the choice of a retirement age that is closer to the economically feasible retirement age. The first component of the third proposition is as follows:

3 a) If an employee makes use of a high level of retirement information that is provided by his/her employer, the anchor, the retirement ages chosen by friends, neighbors, relatives, and known colleagues, will no longer influence the chosen retirement age or the process of reconciling the economically-feasible retirement age to the chosen retirement age. If the level provided or use of retirement information is low, the anchor will influence the chosen retirement age as described in hypothesis 2c) above.


High Level of and Use of Retirement Information Provided by Employer
Anchor = Retirement Ages Chosen by Known Friends, Neighbors, Relatives, Colleagues
Economically Feasible Retirement Age
+ or - are ~ =
Decision to Retire = Chosen Retirement Age
Low Level of or Use of Retirement Information Provided by Employer
Anchor = Retirement Ages Chosen by Known Friends, Neighbors, Relatives, Colleagues
Economically Feasible Retirement Age
Eventually ~ =
Decision to Retire = Chosen Retirement Age
Reduce EFRA
Risky Choices:
• Investment Risk
• Health Evaluation Risk
• Employment Risk
Anchor = Retirement Ages Chosen by Known Friends, Neighbors, Relatives, Colleagues
Economically Feasible Retirement Age
becomes ~ =
Decision to Retire = Chosen Retirement Age

Is age of an individual, especially the proximity of an individual's age to his/her chosen retirement age, another factor that may reduce or negate the influence of the anchor on the retirement decision? Many consultants and employers offer substantial retirement planning programs only to employees nearing retirement, assuming that employees will not take the retirement decision seriously until they are close to retirement (Burzawa, 2001). This assumption also implies that once the decision is taken seriously, the individual/ employee will make a good decision based on his/her circumstances. If this is the case, the anchoring effect will likely occur only at relatively young ages before the individual/employee has seriously considered retirement, and will thereafter disappear. However, limited research in labor economics and anchoring and extensive historical evidence do not support this conclusion. Also, logic does not support this conclusion. Specifically, given an employee's current circumstances and adequate information on retirement planning, a younger employee should be able to and, because of the need to accumulate retirement savings throughout his/her working lifetime, hopefully can choose an economically-feasible retirement age. There is also no reason to assume that an older employee will choose an economically-feasible retirement age unless s/he has received financial information and counseling that allow good retirement planning.

Two studies, one in labor economics and one in decision making with anchoring influences, have found that age and proximity to retirement likely affect neither the relationship of a chosen retirement age to the actual retirement age nor the influence of an anchor, respectively. Anderson, et al (1986) investigated, over a ten year period, whether individuals' plans for retirement changed because of unexpected changes in financial and health factors. They found that a majority of employees (57%) retired when they had planned to; of those age 63, 61, and 58 at the start of the study, 76%, 62%, and 47%, respectively, retired at their planned age. Most of those who were age 63 at the time of the initial survey retired at age 65 or about two years after stating their intended retirement date; during this time, changes in the studied economic climate were just beginning to occur. With regard to investigated employees who changed their planned retirement date, the authors found that a) changes in Social Security wealth, b) deterioration in health, and c) pension provided by the employer all had significant strong effects on retirement plans, positive influences on changes to earlier retirement, and negative influences on changes to later retirement (Anderson, et al, 1986). As these changes in financial and health status occurred, it appeared that the employees changed their planned retirement ages accordingly; it is unknown if they would have changed their plans if such unexpected events had not occurred. A study by Northcraft and

Neale (1987) tested whether demographic variables affected the degree of anchoring. They did not find any significant effects of age, sex, years as a professional, or number of professional transactions completed per year on the degree of anchoring.

A great deal of historical data supports the conclusion that actual retirement ages often are not economically feasible, thus implying that inappropriate anchoring effects are not eliminated as an individual approaches retirement. First, although the trend of earlier and earlier retirement began to slightly reverse during the 1990s, the retirement age of employees is still much earlier than it was 30 years ago despite increases in longevity and substantial increases in expenditures to maintain good health (Rappaport, 2000; Gustman, Mitchell, and Steinmeier, 1994). Second, although the general economic status of the elderly has improved, many of them, particularly women, live in poverty during their retirement years (*EBRI*, 1995; Rappaport, 2000). Such non-optimal behavior is, for example, shown in U.S. statistical data covering the period 1990-92. During this time, the percentage of individuals over the age of 65 who were still working dropped from 15.4% to 13.7%; during the same time, the median income of individuals over the age of 65, adjusted to 1992 dollars, dropped from $15,225 to $14,548 for men and from $8,634 to $8,189 for women, mostly because of decreases in median income from personal assets (*EBRI,* 1995). More workers decided to retire while the median income for this group was declining. Third, research on the antecedents and consequences of bridge employment has found that the significant antecedents with largest effect sizes were all financial or health factors (Kim and Feldman, 2000). Specifically, a person's salary, used as a surrogate for accumulated personal savings, was found significantly and negatively related to bridge employment; following the effect of the variable assessing good health and the variable reflecting the participant's prior decline of an early retirement option, the variable for "salary" had the next largest effect on the decision to accept bridge employment. The variable reflecting the participant's prior decline of an early retirement option was also significantly and negatively related to bridge employment; in the authors' opinion, this result was likely caused by previous decliners holding onto their regular jobs until they could accumulate enough income to retire completely, never entering into bridge employment (Kim and Feldman, 2000). Thus, some take an earlier retirement choice requiring bridge employment to meet financial needs, but others delay retirement until they have financial security. Since the significant, positive effects of volunteer work plus leisure activity had much greater impact on retirement and life satisfaction than the significant, positive effects of bridge employment, it

seems that many who chose earlier retirement might have made a better choice by waiting until financial security was attained.

It is unlikely, without access to and use of additional retirement information, that age or proximity to the chosen retirement age will change the influence of the anchor. First, age has been shown to neither reduce nor enhance anchoring effects. Second, actual retirement ages have been shown to adhere closely to planned retirement ages, except when changes were made because of unexpected economic and health circumstances. Third, as supported by historical data and the need for bridge employment, many retirement decisions are not made optimally. If age and proximity to retirement could reduce the influence of the anchor, we should a) see major differences in chosen retirement ages due to passage of time only and b) see more optimal retirement decisions. The second component of the third proposition is as follows:

> *3 b) After the level of retirement information provided by the employer and the employee's use of this information have been considered, the current age of the employee and his/her proximity to the chosen retirement age will not change the affect of the anchor. The level of retirement information and the anchor will influence the chosen retirement age as described in 3 a) above.*

Future Research: Recommended Methods and Analyses

Criteria for Research Setting

A rich research setting to study the propositions suggested by the literature and theory review would consist of two separate groups of organizations, each of which has contact with future and current retirees, where the first group would include several employers of various sizes and the second group would be an association of citizens over the age of 40. The research participants from the first setting should include all the current employees of the employers who are over the age of 40. The research participants from the second setting should consist of 500 members of the association, who are randomly chosen from a membership pool that includes all nonretired members over the age of 40.

This multiple research setting will provide natural variation for all variables, dependent and independent. First, the group of employers of varying size will have employees in all age brackets and, provided the company is not

recently formed, will have retirees in all age brackets. This age spread will exist particularly if companies have followed an internal-labor-market approach. Employees will decide when to retire based on their specific individual, family, and occupational characteristics; thus, there should be natural variation in the retirement ages chosen. Also, by surveying employees of employers of varying size, employees occupying many different job categories and having a wide range of income, educational, and skill levels, thus producing a range of economically feasible retirement ages, should be included in the investigation. By surveying employees of several employers, differences in the amount of information provided to employees about their retirement plans should also exist. This will enhance the variation in the independent variables. One concern with this setting is the lack of variety in the independent variable measuring perceived health of the employee; most people still employed and actively working are in fairly good health. This concern recommends the inclusion of another separately-administered research setting.

The second setting will be an association of citizens over the age of 40, for example AARP. This setting should provide variability with regard to perceived health of the individual. However, this setting will have shortcomings with regard to potential lack of involvement from an employer, for example, no employer-provided retirement plan and/or no employer communication regarding retirement planning, thus resulting in a very uninformed participant who may be unable to complete the survey. This lack of participant knowledge may provide very important information about the U.S. population in general, however, where the random selection process used to determine the participants for this setting will allow the results to be generalized to the entire organization from which the participants were selected. If the membership of this organization is very large, as expected, and is representative of the entire U.S. population, the results may be generalizable to all individuals who will be retiring in the next two decades.

The multiple research settings within which to administer the survey should reduce the impact of several confounding variables that can affect results obtained from any one setting. In particular, the survey of employees of employers of varying size may contain influences due to the institutionalized corporate settings, influences on the employees' chosen retirement ages, the retirement anchor, employees' descriptions of their health status, their financial status, etc. These corporate influences should be mitigated by also surveying members of an association of citizens over the age of 40. With this association survey, there will be responses from current employees of small, medium, and

large employers who may or may not have ever sponsored a retirement plan. There will be responses from current government employees, current military personnel, and individuals who are currently unemployed. This will greatly expand the variety of responses. However, this second setting may introduce other problems, such as investigating only members of one association, who may be predominately from one geographic area or from a limited socio-economic background. Thus, the best way to address both the needed variety and confounding variables is to administer the survey in two different settings. The resulting database should be analyzed as one data set, with the use of a dummy variable to indicate the setting from which the data were obtained to assess whether important differences exist between the settings.

Measurement of Variables

A Web-based, interactive survey will be made available to individuals over the age of 40 who are members/employees of one of the two recommended research sites. Prior to access to the Web-based survey, each participating individual will be given a copy of the first five pages of it. These pages contain individual-specific questions regarding demographic characteristics, the chosen retirement age, perceived health status, financial condition including salary, needed retirement income, and employer-, individual-, and government-provided benefits, and preferences for time; each participant will be given up to a week to compile the requested data and answer these questions. Once the participant begins the survey, s/he will first complete the first five pages based on the answers that have been pre-assembled and will then proceed to the rest of the survey. Intermediate feedback will be provided to the participant as s/he proceeds, with individual feedback periodically displaying the income needed at the participant's chosen retirement age as compared to the income available from each of the three sources at this age, after which the participant is prompted to answer the next set of questions and to consider making changes in the chosen retirement age, rate of savings, etc. The responses of each participant will be stored in a database as s/he proceeds through the survey; thus, both intermediate feedback that can be provided to the participant and data for future research analysis can be accumulated as the participant proceeds.

The dependent variable (DV) is the age at which an employee plans to retire. This is a continuous variable that will be determined by a question posed at the beginning of the survey that asks each participant the age when they plan to begin receiving benefits from either an employer's pension plan(s) or the Social Security Administration. Thus "Chosen Retirement Age" will be the

assumed future retirement age for all participants. Retirement age is defined by the age the first retirement benefit will begin because this is a) an objective measure that can be verified in the future and b) an economic measure that indicates a specific time when the participant will begin to deplete rather than accumulate assets. To aid in understanding the employee's perception of his/her chosen retirement age, each employee's definition of a "normal retirement age or ages" should be investigated based on questions asked as part of the survey. The survey questions will focus on the employee's personal understanding of "normal retirement age" and his/her knowledge of retirement ages chosen by other colleagues and friends.

The economically-feasible retirement age is an intermediate dependent variable (IDV) determined as the economically best retirement age for each specific individual participant based on his/her financial conditions, health status, and preference for time. This IDV operates as the feedback mechanism to participants, summarizing the individual choices and specific characteristics of each person into a single economically feasible retirement age. The theory and logic supporting the "economically best retirement age," description of the measures used to derive and investigate the IDV, and discussion of the analysis and implications of this research are contained in an earlier paper (Brothers, 2000).

The independent variable, which is both a moderator and a variable directly influencing the chosen retirement age, of proposition 2 is the "Retirement Ages of Peers, Neighbors, Friends, and Family Members" (ANCHOR). The actual determination of this average age, a continuous variable (ANCHOR), will be based on questions asked as part of the participant survey. These questions will ask the person for the actual specific retirement ages of known colleagues, peers, friends, and family members, where the individual will simply list all such known people and their respective retirement ages. This variable will also moderate the relationship between the intermediate and final retirement age. This moderating influence occurs in a dichotomous, yes/no manner, based on the difference between ANCHOR and the intermediate retirement age, IDV. If the difference is positive, the moderator (ANCHOR) will be set equal to one; if the difference is negative, the moderator will be set equal to zero.

The other three independent variables associated with proposition 2 are components of the "Risky Choices" outcome that results from the moderating comparison of ANCHOR with the IDV. The first two of these variables, Investment Risk (IR) and Health Evaluation Risk (HER), represent participant

choices to change prior decisions that were used to calculate the IDV. The decision-making process used to allow this interactive participant involvement is a form of clinical synthesis in which output from a mechanical model is used as input into a clinical judgment (Peterson and Pitz, 1986). In this particular investigation, the calculations are made based on established optimal models, actuarial models for calculating retirement income, financially optimal retirement ages, and expected longevity, and thus do not involve bootstrapping where the model calculations would be done based on the decision makers' own use of cues as analyzed and summarized in a regression equation. Researchers have found that such a process where the participant uses his/her head as a measuring device and formulas as rules to combine the measurements can substantially improve decision making (Kleinmuntz, 1990). Unfortunately, however, humans notoriously resist using such decision aids, especially expert systems without individual intervention. The first of these variables, Investment Risk (IR), will be measured by the difference between the expected variability of the investment combination for personal savings originally chosen by the participant to determine FC and the expected variability of the investment combination that the participant chooses after comparison of the IDV and ANCHOR. This variable will thus be continuous and likely negative, with a possible range from -5 to +5.

The second of these variables, Health Evaluation Risk (HER), will be measured by the difference in expected longevity first calculated based on the individually-health-adjusted, Retirement Plan 2000 mortality tables for combined-healthy participants and second determined by the participant's own assessment of his/her longevity. This variable will also be continuous and likely positive, with a possible range from -4 to +4. The participant's changes in investment strategy and expected longevity will then be used to recalculate the intermediate dependent variable, after converting the longevity change to a year-by-year adjustment of mortality, using the same process as described previously.

The last independent variable associated with proposition 2 that results from the moderating comparison of ANCHOR with the IDV is Employment Risk (ER). This variable will be assessed by survey questions posed to each participant after s/he has seen the latest comparison of the recently-adjusted IDV and ANCHOR. The questions will, for example, ask the participant a) if s/he will be willing to work again after retirement, b) the probability that s/he will need to seek employment again after retirement due to financial conditions, and c) which choice s/he prefers—accepting a later, but more financially secure, retirement age or retiring at an earlier age and then returning to work after retirement. The variable ER will then equal an average of all answers provided to the

employment-during-retirement questions, with answers to each question assessed on a scale of 1 to 7. The higher the average, the more willing the participant is to accept the risk of returning to work after retirement.

The first independent variable associated with proposition 3 has two separate components, Level of Employer-Provided Retirement Information (ERI) and Use of Retirement Information (URI). Both components of this variable will be measured by survey questions, with answers to each question assessed on a scale of 1 to 5, where 1 is defined as no communication of this type and 5 is defined as a high level of information of this type, posed to each participant early in the survey process. The series of questions will ask about various forms of communication that can be provided by employers (e.g., benefit statements showing account balances, benefit statements showing account balances and expected monthly benefits, investment information, retirement videos, retirement planning meetings, retirement counseling) (Burzawa, 2001; *Employee Benefit Plan Review* 2000). For each form of communication, the participant/employee will be asked separately a) how many times s/he has received this type of communication and b) how many times s/he has read or reviewed this form of communication during the last three years. Each participant will also be asked how well s/he understands the information provided and how useful/beneficial s/he finds this information (Barber, et al, 1992).

Several employee characteristics might be significant influencing factors on the retirement decision and are thus included as control variables. First, gender seems to have an important effect, since historical retirement trends are different for men and women (Levine, et al, 1993); the interaction of gender with both a) number of dependents in the household and b) health of the spouse have also been found to be significant predictors of retirement (Talaga and Beehr, 1995). Second, marital status and the retirement status of the spouse are likely important influences because of their effect on the individual's post-retirement financial state and plans and activities (Feldman, 1994; Kim and Feldman, 2000). Next, the pre-retirement employment status of the individual should have an important influence on the retirement decision. If the individual is already unemployed, or fears s/he may soon be, there is little reason not to retire! However, deciding to retire when currently employed means foregoing future income unless a retirement plan is available. Finally, the highest level of education attained by the individual is another influencing factor on this decision. Level of education will likely affect the person's post-retirement plans

and activities as well as his/her pre-retirement personal savings, both planned and actual.

There are also several employer- or industry-specific factors and environmental factors that will influence an employee's retirement decision; thus, these factors will also be included as control variables. The first organizational-specific characteristic that has been shown to affect retirement decisions is whether the employer sponsors a retirement plan(s) (Karoly and Rogowski, 1994; Levine and Mitchell, 1993). Next, organizational and/or industry characteristics that describe the physical, intellectual, and social demands of a job have been shown to influence retirement decisions (Feldman, 1994). One set of such factors includes the industry and profession from which retiring, an individual's management responsibilities at the time the retirement decision is made, and the size of the firm from which the employee is retiring. In addition to influencing job demands, the size of a company also has a strong relationship with the firm's provision of security benefits, such as retirement plan(s), health plan(s), post-retirement health plan, etc. Next, the regional unemployment rate will affect a retirement decision; the unemployment rate alters employees' future employment opportunities, real or perceived. Macroeconomic indicators such as growth rates, inflation rates, and the other leading economic indicators are also likely to influence the retirement decision by affecting an employee's financial uncertainly in post-retirement years (Feldman, 1994). Finally, the geographic location of the individual at the time the retirement decision is made will influence the individual's post-retirement plans and activities as well as increase (or reduce) the social influence of other observed retirees and their activities.

Analyses using Statistical Methods

The first statistical procedure that will be used will be calculation of the means and standard deviations of all variables. The actual values and distribution of the DV and several of the IVs are of interest with regard to differences among groups of participants, groups that are defined by a) differing levels of employer-provided information and b) differing ages, differences with prior published results, and longitudinal differences when the studied participants are revisited in the future. Also, a table of correlation coefficients will be constructed to reveal the strength and direction of the relationships between the variables and indicate possible problems with multicollinearity.

The main form of analyses used to test propositions 1 and 2 will be hierarchical, multiple linear regression with nonlinear, moderator effects. At

present, the regression model is assumed to be linear in all variables, with a specific set of nonlinear components resulting from the hypothesized moderating effect of the anchor. This basic linearity assumption may change with further refinement of the variables and insight into their impact on the dependent variable, Chosen Retirement Age. The causal model first assesses the influence of the set of control variables on the choice of a retirement age, then the influence of the hypothesized economic variables, then the influence of the hypothesized anchor (the retirement ages of known friends, colleagues, neighbors, and family members), and finally the hypothesized additional causal influence of the risky, irrationally-induced variables.

To determine if the propositions are supported, each regression coefficient will be tested to determine if it is significantly different from zero using applications of the null hypothesis at the 0.05 level of significance. Hierarchical regression analysis includes analysis of variance as a major component. Analysis of variance tests the ability of each proposition or set of variables to explain variation in the dependent variable, Chosen Retirement Age, about its mean by determining the amount of additional variance that is explained by regression on each additional specific set of variables. The assumption behind this test is that significant increases in the ΔR^2 as each successive set of variables is added to the model indicates that each additional set of added variables provides additional explanatory information about the factors that influence the dependent variable, *Y*. A more useful term than R^2, which controls for inflationary increases due to simply adding additional variables, is called the adjusted R^2 and is equal to $(n\text{-}1)/(n\text{-}p\text{-}1) \times R^2$; the adjusted R^2 will be used for the actual test. To complete this statistical method and determine if each set of variables adds explanatory value, each R^2 and ΔR^2 will be tested to determine if they are significantly greater than zero using applications of the null hypothesis at the 0.05 level of significance.

The type of analysis used to test both components of proposition three will be a two-way form of analysis of covariance, with significance tested by a Chow test (*Stata Reference Manual*, 1997). For both proposition 3 a) and 3 b), determination of whether these propositions are supported or not depends on whether the mutually exclusive subsets of the total sample database produce distinctly different influences of the economic, anchor, and irrational sets of variables on the dependent variable, the chosen retirement age.

Limitations of This Study

The use of a retirement age definition that is not all encompassing is definitely a limitation of the research as designed. The results, regardless of their support of the hypotheses, will not be generalizable to all retirees. This limitation is necessary, however, given the current complex, multi-faceted state of retirement. As described previously, retirement may now be defined by several different triggering events. The triggering events or various ways to assess the state of "retirement" include being employed less than full time (known as partial or phased retirement), receiving a pension, forced or "implied" mandatory retirement, early (prior to age 65) as compared to normal retirement, and assumption of the person that they are "retired" (Levine and Mitchell, 1993; Beehr, 1986). It is assumed by some researchers (Beehr, 1986) that these differing definitions of retirement are one likely explanation for the differences obtained by research to date in the type and significance of influencing factors on the retirement decision. Thus, the best if not only way to study the retirement issue at this time is to choose one specific definition and then later redo the same study using a different definition. The results can then be compared to determine the consistently and/or differences based on retirement age definition. Alternatively, if the participant pool is large enough and data are collected on all retirement "triggering events," the relationship among the various definitions of retirement can be tested as part of this study. The state of retirement used for this study, namely, receiving a pension, is the most appropriate definition, keeping in mind the propositions being investigated, the testing environment, and the objectivity of this measure.

The first independent variable measuring the financial condition of the future retiree can also be a potential source of limitation for this study. This is a very complicated variable that is based on several financial calculations. It is unlikely that a future retiree will know the exact, or even a reasonably close estimate, of the components of this calculation; this is where expertise as an employee benefits actuary will help. With proper participant authorization and a listing of personal assets, this "replacement income" can be accurately estimated; in fact, sharing the result of these calculations with the participant is the planned incentive to encourage participation and survey completion. Regardless of the incentive to participate, it is likely that length of the survey and amount of detail needed to complete it will reduce the response rate and thus the power and generalizability of the results. Therefore, the survey must be carefully designed, the incentive emphasized, and follow-up rigorously performed to ensure the maximum possible response rate.

As described in components of proposition 2, the choices available to a participant are not as clearly defined as those provided in other studies, mostly experimental, that have assessed risk-seeking behavior under Prospect Theory. Previous studies have, with each set of choices, stated the frame of reference (for example, lives saved versus deaths), the type of good at stake, the probability of gain and loss, and the size of the payoff at risk (Kuhberger, et al, 1999). The choices presented to participants in this study, choices of a retirement age, with the participant's original chosen age and the economically-feasible retirement age serving as the main two options, are not as clear cut as the choices provided in these other studies. This lack of clarity is mainly due to the fact that the present study involves an actual major life decision, where the facts are based on each participant's characteristics and where the choices include future uncertainties which are not clear and well-defined (Fox and Tversky, 1998). First, the type of good at stake involves allocation of three different goods, money, time and effort; the study does address this problem by decomposing the final analysis into factors and choices related to each of these three different goods separately. Second, the frame of reference, gain versus a loss, is not clearly stated. However, given the options available if a participant's anchor age is less than his/her economically-feasible retirement age as described in the derivation of proposition 2 a) and 2 b) above, it seems very likely that the participant will view or frame
these options as a loss and will see the final outcome as a loss; also, the participant is asked his/her opinion of this comparison as part of the survey to check that these choices are truly viewed as losses. Third, although each participant is given feedback that shows the size of the payoff at risk, s/he is not given a specific probability of loss. However, this should not change the hypothesized study outcomes. Researchers have tested both risky prospects and uncertain prospects whose outcomes were contingent on upcoming events; they found greater departures from expected Utility Theory when probabilities were not known (Fox and Tversky, 1998). With regard to the present study, the choices available to a participant involve a great deal of uncertainty with regard to future events, and, consequently, the participant will likely be a stronger risk seeker when the framed choices and final outcomes are seen as losses.

This study does not currently contain a process-tracing procedure to follow the decision maker through this important decision process. Measures resulting from such a process-tracing method could include the amount of time each participant spends answering specific questions about each component, the amount of time each participant spends considering his/her risky options, the participant's choice of which of the three economic components, money, time,

and effort, to investigate first, etc. Such measures could add additional explanatory value to this important individual decision-making process, and, for example, could differentiate individual respondents based on their assessments of which of the three scarce resources should be considered first. A process-tracing procedure can be added before the survey is administered, although it will add more complexity and length to an already complex and lengthy assessment and will likely interfere with protection needed for the survey so that participants are not able to adjust previous answers after receiving feedback. Thus, the costs and benefits of adding process tracing must be considered and investigated further before the survey is completed.

Another major limitation that is apparent even before the study commences is the fact that all the independent variables change, often dramatically, over time. Changes in these variables along with changes in the listed control variables will likely cause changes in the predicted retirement ages of current employees (Anderson, et al, 1986) and *possibly substantial changes in the relative influence of these variables*. Thus, to study the retirement decision and the relevant influencing factors completely, this study would need to be longitudinal, where the participant groups who are now five years from estimated retirement are restudied five to seven years hence, the participant groups who are now 10 years from estimated retirement receive the same survey and are restudied five to seven years from now and again 10 to 12 years from now, etc. Thus, the present group of participants must be followed and the study must be repeated as noted. Only then can we hope to understand an individual's retirement decision, the factors that influence this decision, and the way these factors change over time.

Discussion and Conclusion

Implications If Propositions Are Confirmed

The results of studying the hypotheses generated by Bounded Rationality and Prospect Theory with Anchoring will enhance our understanding of an individual's retirement decision, both the actual choice of a retirement age and the factors that influence this decision. This study will show the impact of many influences, through control variables, economically-based independent variables, and independent variables suggested by decision-making cognitive biases and risk-seeking behavior, on the retirement decision. In particular, this will be a direct application of Becker and colleagues' (1976) economic approach to analysis of a retirement decision, one area of individual behavior that has not been

directly investigated. Also, this study may provide important information about the end of the earnings lifecycle as determined by the employee. This study will certainly enhance knowledge about the retirement decision, an issue that has been a "key [but] unanswered question [s]" since 1957 (Feldman, 1994, p. 285; Rappaport and Schieber, 1993, p. 6; Beehr, 1986, p. 45; Mathiasen, 1957, p. 101).

This study will also be an important addition to the literature on non-economic decision making. As mentioned above, Prospect Theory and Anchoring have mainly been investigated through experimental work; the goods at stake, as well as the probabilities of loss and the amount at risk, have been defined by the researchers. However, when an individual is faced with a major life decision where his/her own finances, health, and time considerations are at risk, will s/he behave the same as Prospect Theory suggests? This study can be significant in assessing this impact of cognitive biases on such an uncontrolled, but very risky and uncertain, decision. This study is also unique and important because it incorporates clinical synthesis, feedback from actuarial models, as part of the ongoing decision-making process. Will a decision maker trust and use such information when it is provided or will s/he continue to rely on the anchor and supporting cognitive biases? The results of this study will provide valuable information about these questions with regard to the standard, non-expert individual's decision-making process as s/he analyzes a major life choice, one that most of us must make some day.

Perhaps more importantly, this study will enhance our understanding of the entire decision-making process. When making a major life decision, does an individual use an economic, boundedly-rational analysis as assumed and studied by many different research groups? Or, even with an important decision, does an individual default to decision-making heuristics and the resulting cognitive biases and risk-seeking behavior because of the overwhelming number of choices, amount of information, and uncertainty inherent in a boundedly-rational analysis? Alternatively, the results of the study may show that cognitive biases only "add" explanatory value to an already existing economic approach. This will be an important contribution to the study of decision making, since, as with the retirement decision, specific, definable factors that influence an individual's decision-making process and thus might be restructured or redefined to affect this decision are important for many areas of research.

Managerial And Public Policy Applications

On one hand, an employee's decision to retire means an organization will need to replace an experienced, knowledgeable member. On the other hand, an employer may want senior employees to retire in order to provide promotion opportunities for younger, more junior employees. Thus, organizations have several reasons to be interested in the way and time an employee chooses to retire. The Theory of Bounded Rationality has a long history of managerial applications. In fact, the basis for incentive compensation, as well as for merit pay, is grounded here. A study of actual employees' decision-making processes, as related to financial stability, health, and preference for leisure time, could thus have important managerial applications by reviving the initial emphasis of retirement plans as an organizational planning tool. If instead, risk-taking behavior predicted by Anchoring and Prospect Theory is the predominate influence on an employees' decision-making process, then companies can only address and influence behavior through changes in the anchor age determined by the retirement decisions of known others. This change process would likely be slow and agonizing, involving unpopular changes in retirement plans such as eliminating early retirement and retirement windows and providing strong inducements for highly visible employees to retire late. The techniques to be used to affect behavior will be quite different depending on whether Bounded Rationality versus Anchoring and Prospect Theory is found to be most influential.

If the number of employees retiring in any given period is high or low in comparison to the number of new labor-market entrants, employees' decisions will affect the labor market supply of the business that the employees are leaving, the industry of which the business is a member, and possibly the general population (Rappaport and Schieber, 1993). The size of the retired component of the population also affects goods and services available to society as a whole, because as the proportion of the total population that is retired increases, so does the proportion of the economy and the GDP focused on providing the needs and wants of the elderly (Rappaport and Schieber, 1993). Knowledge of the process employees use to decide when to retire would certainly be beneficial with regard to redesign of the Social Security and Medicare systems, as well. Thus, the results of our study of proposition 1 and 2 and the relative explanatory ability of the full model with regard to the retirement decision are very important and interesting for both managerial and public policy application purposes.

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