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Peter Croy
Edith Cowan University

Paul Gerrans
Edith Cowan University

Craig Speelman
Edith Cowan University

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The Role and Relevance of Domain Knowledge, Perceptions of Planning Importance, and Risk Tolerance in Predicting Savings Intentions

Gerry Croy[a], Paul Gerrans[a], and Craig Speelman[b]

[a]School of Accounting, Finance and Economics, Edith Cowan University

[b]School of Psychology and Social Science, Edith Cowan University

Corresponding author. Name: Gerry Croy. Address: School of Accounting, Finance and Economics, Edith Cowan University, 270 Joondalup Drive, Joondalup 6027, Western Australia. Tel.: +61 893806551; E-mail address: p.croy@ecu.edu.au

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Abstract

The need for individuals to increase retirement savings has been widely promoted, yet our understanding of the motivations of individuals to save at a higher rate remains sparse. This paper reports the findings of a survey of 2300 retirement savings fund members and their motivations to contribute more to savings and to actively manage their investment strategy. Utilising the theory of planned behaviour, the study reveals respondent's self-reported attitudes, subjective norms and perceptions of behavioural control account for a high proportion of the variance in behavioural intention. Contrary to expectations, the study finds that respondent's risk tolerance adds little to the prediction of behavioural intention. By contrast, perceptions of planning importance and self-assessed planning preparedness (domain knowledge) are found to exert powerful indirect influences on behavioural intentions via the perceived behavioural control construct. This novel finding confirms the relevance of planning constructs and financial literacy to an understanding of retirement savings behaviour, and establishes a need to improve levels of financial literacy in society.

Keywords: Savings, Planning, Knowledge, Risk Tolerance, Intention

JEL Classification: D91; PsycINFO Classification: 3920

1. Introduction

One of the most pressing economic issues to face global society over coming decades is how retirement incomes will be funded for an increasing proportion of retirees. In this research, we use data from Australia to investigate important psychological antecedents of key retirement savings behaviours.

It is estimated that by 2050 there will be 23.5% of the Australian population aged 65 and over, compared to 10.7% currently (Australian Treasury, 2002, 2007). Moreover, the proportion of people aged 65 and over relative to people of traditional labour force age, 15 to 64 years, is projected to increase from the 2002 level of 19% to almost 41% by 2042 (Australian Treasury, 2002). It has also been identified that more than three million Australians are below targeted retirement savings adequacy levels (Access, 2008; see also, Rothman, 2007; Russell, Brooks, Nair, & Fredline, 2006). These statistics are not peculiar to Australia as a similar demographic shift is forecast for many other developed countries.

An obvious approach to improve the quality of life for individuals in retirement, and to alleviate the forecast Australian government budget burden, is to induce people to save through superannuation.[1] The focus of the present research is the motivations of individuals to contribute to superannuation beyond the mandated employer-level contribution, together with individuals' motivations to manage the manner in which accumulated savings are invested. Investment strategy management

[1] Retirement income provision in Australia is predicated on three *pillars*: (1) the age pension; (2) mandatory contributions under the Superannuation Guarantee (administration) Act 1992, which currently requires employers contribute a minimum of 9% of employee wages to a complying superannuation fund; and (3) voluntary savings, primarily through, but not restricted to the tax-preferred superannuation system.

is reflected in choices made by the individual when choosing risk/return-dependent investment portfolios, or when modifying asset allocations within the chosen portfolio. Investment strategy change by an individual is indicative of fine tuning of one's investment account, and thus, it represents a likely improvement in one's portfolio performance.

Reporting on a 2006 survey of 2300 superannuation fund members, the aim of the present paper was to identify the relative importance of key determinants of behavioural intentions and to relate these to intervention possibilities. The *theory of planned behaviour* (TPB, Ajzen, 1988) was used for these purposes as it has been widely applied in past research and shown to be robust across diverse behavioural contexts. The paper draws on several studies (discussed in Section 2.2) which find roles in retirement savings decision making for retirement planning constructs, such as *perceived planning importance* and *planning preparedness*, and *risk tolerance*, as well as demographic variables such as *gender*, *age*, and *income*. Better understanding of the influence of planning constructs, risk tolerance and demographic variables in retirement savings decision making is clearly important to practitioners and to social welfare planning policy. Moreover, important to a broader understanding of the motivations for prescribed retirement savings behaviours is the need to place behavioural antecedents studied by the field in a theoretical context. Thus, use of the TPB framework was expected to provide a basis for understanding the relative predictive importance among TPB constructs, and the planning and risk tolerance constructs, which are of particular interest to this study.

2. Literature review

2.1. The Theory of Planned Behaviour

The theory of planned behaviour (TPB) is predicated on three variables found to adequately predict the *intention* to perform a given behaviour (Ajzen & Fishbein, 2004). These variables are one's *attitude* towards the behaviour, one's perception of social pressure as a consequence of the views and actions of significant others (*subjective or social norms*), and one's perceptions of control over performance of the behaviour (*perceived behavioural control*). Measurement of these constructs is performed directly, according to multi-item scales. Intention and perceived behavioural control together predict actual performance of the behaviour in question; however, the focus of this paper is on the antecedents of intention. The TPB has explained, on average across various contexts, 39% of the variance in intention and 27% of the variance in behaviour (Ajzen & Fishbein, 2004).

According to Ajzen and Fishbein (2000), variables external to his theory either add little in terms explaining additional variance, or the so-called *external* variables tend to be mediated in their influence on intention by standard TPB predictors. Therefore, an important element of our present design was to control for the influence of TPB variables in the attempt to establish causal roles for the external variables of interest. Perceived planning importance, planning preparedness, and risk tolerance (as well as demographic variables) were not expected to directly influence intentions. However, whether their influence is more distal to the TPB's predictors was a question of fundamental interest to contextualizing temporal causality of intention for intervention purposes.

2.2. Variables external to the TPB

2.2.1. Planning constructs

In the US population, Lusardi and Mitchell (2006, 2009b) provide evidence that financial illiteracy in the context of retirement planning is widespread,

particularly among vulnerable demographic groups such as the least educated, women, and minorities. Similarly, Lusardi (2008) finds that close to half of older workers do not know which type of pensions they have and the large majority of workers know little about the rules governing social security benefits. Lusardi (2008) argues ignorance about basic financial concepts is linked to lack of retirement planning and lack of wealth. The importance of retirement planning is further emphasised by Lusardi and Mitchell (2007a) who find *planners* arrive close to retirement with much higher wealth levels and display higher financial literacy than non-planners. Focusing on gender issues, Lusardi and Mitchell (2008) also find that older women display much lower levels of financial literacy than the older population as a whole. Moreover, women of lower financial literacy are less likely to plan for retirement and to carry through on their plans.

Other researchers find similar results for the nexus between knowledge (financial literacy) and planning. For example, Clark, d'Ambrosio, McDermed and Sawant (2003) find that after participation in a financial education seminar a significant proportion of the respondents indicated that they had revised their goals and planned to modify their saving and investments. Moreover, Stawski, Hershey and Jacobs-Lawson (2007) find that retirement goal clarity is a significant predictor of planning practices, and planning, in turn, predicts savings tendencies. Further, Hershey and Mowen (2000) find both personality constructs and financial knowledge to be significant predictors of pre-retirement planning.

Constructs variously described as future time perspective, future orientation, propensity to plan, and planning mindset have been studied in relation to retirement saving. Jacobs-Lawson, Hershey and Neukam (2004) assess the influence of future time perspective as a surface level personal trait. Results revealed that women spent

less time thinking about retirement than men, suggesting that separate retirement intervention programs are warranted that meet the unique needs of working men and women. Moreover, Deaves, Theodore Veit, Bhandari and Cheney (2007) find that pension contributions are positively correlated with the propensity to plan. And, Bhandari and Deaves (2008) find that younger, more-educated, higher-earning advice-receiving males with a planner mindset hold more equity, and an understanding of asset allocation accentuates the impact of the key factors age, income and a planner mindset. Finally, Howlett, Kees and Kemp (2008) find that self-regulatory state, future orientation, and financial knowledge can influence consumer evaluations and intentions related to retirement fund investments. Findings suggest that consumers who express higher levels of future orientation are more likely to participate in a retirement plan, an effect moderated by self-regulatory state.

In Australia, Worthington (2008) attempted to predict knowledge and perceptions of superannuation on the basis of demographic, socioeconomic and financial characteristics. Knowledge of superannuation was defined in terms of understanding superannuation fees, charges and statements, recognising the voluntary and compulsory nature of additional employee and employer contributions, and being aware of the lower taxation of superannuation compared to other investments. Overall, about 60% of respondents could correctly answer only 50% or less of the questions posed. Similar results are reported by Mercer (2008) from an Australian survey that found 72% of respondents expected their superannuation to have grown over the year to June 2008, 76% didn't see a link between superannuation and the investment markets, and nearly one in three (29%) were unsure of their investment strategy. Other Australian studies have focused on issues of confidence, finding that that employees report feeling ill-informed and ill-equipped for the decisions presented

to them relating to their superannuation decisions (Clare, 2002; Clark-Murphy & Gerrans, 2001).

2.2.2. Risk tolerance.

In a study which linked propensity to plan with risk tolerance, Deaves et al. (2007) find that those with a higher propensity to plan are more risk tolerant. Deaves et al. also find risk taking to be positively associated with income, and negatively associated with age. Controlling for age, income, and education, Watson and McNaughton (2007) examine the impact of gender on superannuation fund risk preferences. Findings suggest that women choose more conservative investment strategies than men. Similarly, Speelman, Clark-Murphy and Gerrans (2007) find that, with some exceptions, females are more risk-averse than males. However, questioning the stereotype that women are more risk averse than men in their investment decisions, Badunenko, Barasinska and Schäfer (2009) used data from five European countries to examine gender differences by explicitly controlling for investors' self-perceived willingness to take financial risk. Results confirm the gender stereotype only partially. Women were found less likely to hold risky financial assets. However, conditional on ownership, females allocate an equal or even a higher share of their wealth to these assets than men. The authors suggest that especially in case of women, the declared attitude toward financial risks may be misleading as it does not necessarily reflect the actual willingness to bear risks.

3. Research objectives

Several studies have demonstrated associations between the variables of interest to this study, but a lesser number of studies has established causal paths. However, Lusardi and Mitchell (2009a) argue that financial literacy (domain knowledge) is antecedent to planning, rather than the other way around. Accordingly,

attention is increasingly being directed at the nature of financial literacy education interventions and their effectiveness (Lusardi, 2008; Lusardi, Keller, & Keller, 2009; Lusardi & Mitchell, 2007b, 2009a, 2009b).

The aim of the present study was to investigate the causal relations among perceived planning importance, planning preparedness (operationalised here as self-rated domain knowledge), perceived risk tolerance, and behavioural intention, which are variables of much interest to researchers in the field of retirement savings and preparedness for retirement. In investigating temporal causality among the variables we control for the influence of TPB variables, as these have been shown to be important predictors of intention across diverse behavioural contexts. Thus, a further objective of the study was to provide perspective to future research efforts by describing the relevance of key antecedents of retirement savings intentions in terms of predictive importance. To our knowledge, this is a first attempt to describe temporal causality and predictive strength among the variables of interest, and to couch the study within a theoretical framework such as the TPB.

4. Method

4.1. Participants

Participants were randomly selected from four Australian superannuation fund member-databases. Respondents required 30 minutes to complete and return questionnaires. Of a total of 20,000 questionnaires distributed by mail 2,339 (12%) were returned, raising the possibility of bias in the data (Moser & Kalton, 1972; Oppenheim, 1966). It is not possible to compare the demographic characteristics of survey respondents with those of non-respondents. However, the population of interest was the Australia working population. Inspection of labour force survey information revealed that average worker-age is 39 years, males comprise 54% of the

work force and average worker annual earnings are $43654 (Commonwealth of Australia, 2006a). Table 1 displays summary demographic characteristics of the questionnaire sample. Females were over represented in the sample relative to the overall Australian population, though it is reflective of the overall fund membership profile of the four funds. The middle-aged were similarly over represented and average participant income was slightly lower than the population average. The opportunity to perform gender and age-based analyses of the data alleviated some concerns about over/under representation of demographic groups. Nevertheless, the generalisability of some aspects of results remains subject to qualification.

<Insert Table 1>

Table 2 presents the range and proportion of occupation in the participant sample. When compared to the Australian population (Commonwealth of Australia, 2006b), the most notable differences in the sample were the over-representation of professionals and under-representation of Technicians, Sales Workers, and Labourers. To the extent that the data were not analysed for inter-group differences relating to these demographics, the results are subject to qualification.

<Insert Table 2>

A low survey response rate might also be associated with differences in psychological dimensions of respondents compared to non-respondents. Respondents have, on average, larger superannuation balances than the general population, and this may not be fully explained by the comparatively higher mean age of respondents.[2]

[2] The average superannuation balance in the general population is approximately $70000 (Commonwealth of Australia, 2002), and average worker age is 40 years. If the population balance were simply doubled, the resultant estimation of the average population household superannuation

Thus, argument could be made that respondents may be more involved in the superannuation system than non-respondents. In turn, being more involved may indicate differences in the mean levels of the predictor variables in the present model between respondents and non-respondents. If this were so, the differences in mean levels and relative predictive power of predictors may hold implications for generalisability of results and for intervention design.

4.2. Measures for TPB variables

All TPB measures were based on Ajzen's (2002a) method. Substantial bodies of theory and research support the validity of TPB constructs (for reviews see Armitage & Connor, 2001; Connor & Armitage, 1998). Responses were required for the intention to perform two key retirement savings behaviours: "to contribute extra to superannuation within the next 12 months" and "to change superannuation investment strategy within the next 12 months".

All TPB constructs were measured by 7-point unipolar item scales. Attitude toward performing the two target behaviours was assessed by means of five evaluative semantic differential scales (Osgood, Suci, & Tannenbaum, 1957). The anchors of these scales were: *harmful-beneficial, unpleasant-pleasant, bad-good, worthless-valuable, unenjoyable-enjoyable* and *wrong-right.* Coefficients alpha for attitude toward contributing extra and managing investment strategy respectively were 0.85 and 0.88. To measure subjective norm, respondents were asked to indicate the extent to which they believe that most people who are important to them, or whose opinion they value, think that: they *should not-should* perform the target behaviours; would *expect them* to perform the behaviours (extremely unlikely-extremely likely);

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balance ($140000) is somewhat less than that of the sample ($190000; average respondent age 45 years).

would *disapprove-approve* of them performing the behaviours; *would-would not* perform the behaviours themselves; and *intend* to perform the behaviours themselves (*completely false-completely true*). Coefficients alpha for subjective norm toward contributing extra and managing investment strategy respectively were 0.80 and 0.78. Three items assessed perceived control over the target behaviours. Respondents were asked whether performance of the two behaviours would be *impossible-possible*, whether, if the respondent wanted to, he or she could perform the behaviour (*definitely false-definitely true*), and the respondent's perception of the degree of control possessed over performing the behaviour (*no control-complete control*). Coefficients alpha for perceived behavioural control toward contributing extra and managing investment strategy respectively were 0.78 and 0.76. Finally, three items assessed intentions to perform each of the focal behaviours. Participants indicated to what extent they intend to (*extremely unlikely-extremely likely*), will try to (*definitely false-definitely true*) and plan to (*strongly disagree-strongly agree*) perform the target behaviours. Coefficients alpha for the intention to contribute extra and manage investment strategy respectively were 0.78 and 0.76.

4.3. Measures for variables external to the TPB

Three items were used to measure respondents' perceptions of the importance of planning. Respondents were asked to state their strong agreement or strong disagreement on 7-point unipolar scales in response to each of the following items: "I regard myself as a person preoccupied with ensuring that myself and my family can retire on a good income"; "I think of myself as a person who is very concerned with building adequate wealth for retirement"; and "I think of myself as a long-term financial planner". Coefficient alpha for perceived planning importance was 0.75.

The planning preparedness construct is equivalent to a *domain knowledge* construct. The measure comprised aspects of the superannuation system in Australia and aspects of investing in the share market. Participants were asked to rate their knowledge on 7-point unipolar scales anchored at the low end by *extremely poor* and, at the high end, by *extremely good* in response to each of the following items: "investing in shares and other financial securities"; "how I can make changes to the amount I contribute to superannuation"; "how I can make changes to my superannuation investment strategy"; "the rate at which my superannuation savings are likely to grow over time"; "the amount that I will eventually need to have saved for a comfortable retirement"; and "potential risks versus returns when investing in the share market".

The risk tolerance measure was based on a scale widely used by research in the field (US Federal Reserve Board Tri-Annual Survey of Consumer Finances, see Sung & Hanna, 1996). Respondents were asked "Which of the following statements comes closest to the amount of financial risk that you are willing to take when you save or make investments," from the list of five options: Take substantial financial risk expecting to earn substantial returns; Take above average financial risks expecting to earn above average returns; Take average financial risks expecting to earn average returns; Prepared to minimise financial risk and accept a lower return; or Not willing to take any financial risks.

4.4. Survey procedure

The survey questionnaire was designed to minimize participant response ordering effects and participant fatigue effects. Fatigue effects were considered likely given the length of the questionnaire. Different items assessing a given construct were separated and presented in a non-systematic order, interspersed with items for the

other constructs. Additionally, the sequence of questions was rotated by dividing the questions into four equal sets and rotating these questionnaire segments across participants. Moreover, care was taken in the questionnaire to counterbalance high and low endpoints of scales in order to counteract possible response sets. The questionnaire was distributed by the four superannuation funds with a covering letter of support from the fund. Before processing, questionnaire responses were checked for completeness and data were entered into spreadsheets, which were, in turn, checked for accuracy of data entry. Prior to data analysis, scale counterbalancing was reversed so that high-score endpoints reflected positive intentions in all cases.

5. Results

5.1. Descriptive statistics

Inspection of mean scores in Table 3 reveals respondents assessed the importance of planning and tolerance for risk moderately highly, whereas respondents' belief in their preparedness for planning, according to self-assessed domain knowledge, was rated as neither good nor bad. Mean intention scores were ambivalent, but they reflect a greater preparedness to contribute extra to superannuation than to change investment strategy.

<Insert Table 3>

Of particular note from inspection of Table 4 were medium to good correlation[3] between planning importance (PI) and planning preparedness (PP); small to medium correlation between PI and perceived behavioural control (PBC), and PP and PBC; and medium, and small to medium correlations respectively between risk tolerance (RT) and PP and between RT and PI. Inspection of Table 4 reveals RT to

[3] Cohen's (1988) guidance was adopted, wherein a correlation coefficient of between 0.10 and 0.29 was taken as a small relation, between 0.30 and 0.49 as medium, and between 0.50 and 1.00 as large.

be, understandably, more strongly related to PBC for investment strategy decisions compared to extra contribution decisions. The strength of correlations were considered to be favourable in terms of the potential to establish significant causal paths by modeling covariance among the variables, which was undertaken in the next stage of the analysis.

<Insert Table 4>

5.2. Model estimation

Testing of planning constructs and RT within a TPB framework is a novel approach, but an approach which supports the important objective of discerning relative predictive importance among the antecedents of intention, including the robust antecedents represented by the TPB. Structural Equation Modelling was used to test the causal relations among variables. To control for direct effects of TPB predictors, the attitude, subjective norm and PBC variables were allowed to directly influence intention. Given Ajzen's (2001) view that determinants external to his theory are likely to be more distal in their influence, we reasoned that PP would predict PBC (an approach also informed by Frick, Kaiser, & Wilson, 2004 who link knowledge with PBC), thus, PP was allowed to directly influence PBC. In turn, we reasoned that PP would be antecedent to an individual's sense of planning importance. This view reflects that of Hershey and Mowen (2000), who find the kindred variable Future Time Perspective antecedent to perceived financial knowledge and retirement involvement. We therefore allowed PI to directly influence PP. We also reasoned that higher scores in both planning constructs would predict greater willingness to adopt investment risk (see, for example, Corter & Chen, 2006). Accordingly, both PI and PP were allowed to directly influence RT. In order to account for partial mediation by PP, RT, and PBC, PI was allowed to directly

influence PBC and both PI and PP to directly influence intention. Lastly, we reasoned that RT would be positively associated with intention, and the association would be more evident with respect to the intention to change investment strategy (e.g., Corter & Chen, 2006).

These relationships are shown diagrammatically in Figure 1 (extra contributions) and Figure 2 (investment strategy change). Estimation of the models revealed good fit to the data[4] for each of the target behaviours (see Figures 1 and 2).

<Insert Figure 1>

<Insert Figure 2>

5.3. Predictive importance

Inspection of standardised regression coefficients in Figures 1 and 2 reveals TPB variables were highly influential antecedents of intention for both target behaviours. Moreover, as expected, relative importance among the predictors of intention varied across the two target behaviours. Of particular note in relation to this paper were the causal relations among risk tolerance, planning constructs, perceived behavioural control and intention. We now discuss results for the modelling of these variables.

5.3.1. The influence of risk tolerance

[4] Good model fit is indicated by levels for the comparative fit index (CFI) of 0.95 (or close to 0.95) and above (Hu & Bentler, 1999). Guidelines for using the root mean square error of approximation (RMSEA) are that it should be at or below 0.05 for a well-fitting model, and at or below 0.08 for a reasonably fitting model (Hu & Bentler, 1995). The root mean square residual (RMSR) value for good model fit is 0.08 (Byrne, 1989), with lower values representing better fit. Good model fit is also reflected in a non-significant chi-square statistic. However, the chi-square fit index is highly sensitive to sample size, such that with large sample size it is unlikely that the chi-square will achieve non-significance (Kline, 1998).

Risk tolerance was a significant predictor only of the intention to change investment strategy, which reflects the greater relevance of risk cognitions for decisions about sharemarket investing compared to decisions about contributing extra. Inspection of Table 5 reveals that, when tested for gender difference in relation to the intention to contribute extra, RT was significant ($p < .05$, and negative) for females and not significant for males. However, coefficient size for females suggests a very minor role for RT compared to other predictors of intention. No significant paths were encountered across age (Table 6) or income groups (Table 7) for the influence of RT on the intention to contribute extra to superannuation.

<Insert Table 5>

<Insert Table 6>

<Insert Table 7>

The influence of RT on the intention to change superannuation investment strategy was positive across gender (see Table 5), but significant ($p < .01$) only for females. Thus, females appear more inclined than males to consider investment risk when contemplating investment strategy decisions. Coefficients were significant ($p < .01$) for the younger age group (Table 6) and the lower income group (Table 7). Thus, the significance observed in the pooled data for RT in predicting the intention to change superannuation investment strategy appears confined to females in the lower age and income groups. For these respondents, higher (lower) self-assessed risk tolerance promotes greater (lesser) intention to change investment strategy.

Inspection of Figures 1 and 2 reveals that, for both behaviours of interest, coefficients for the regression of PI and PP on RT were significant ($p < .01$). Inspection of coefficient size suggests PP has greater influence than PI in predicting RT. These results were consistent across gender, age and income groups (see Tables

5, 6, and 7). However, relative strength of coefficients suggests difference in responses to scales by respondents in age and income groups. This was tested by modelling age and income as independent variables (not reported here). In this analysis, both age and income were found to be significant predictors of risk tolerance—younger age predicted greater risk tolerance as did higher income. For both behaviours of interest (scales were generic to both behaviours), PI and PP explained 16% of the variance in RT, suggesting roles for determinants of RT beyond those tested here.

Interpretation of the relevance of RT in predicting intention in the present domain should be tempered by the finding that RT exerts no significant influence on the intention to contribute extra (Figure 1). However, when compared to the influence of TPB predictors, RT appears to exert small, yet significant ($p <. 01$) direct influence on the intention to change investment strategy (Figure 2).

5.3.2. The influence of planning constructs

As expected, the effects of PI and PP on intention are mainly transferred to intention by the PBC construct. Of the direct relations between PI, PP and intention, the path from PP to the intention to contribute extra produced the sole significant (and negative, $p < .01$) regression coefficient. For both behaviours, the influence of PI on PBC was partially conveyed by PP, as direct paths between PI and PBC were significant for both behaviours of interest (Figures 1 and 2). Nonetheless, a large portion of the variance in PP was explained by PI in both models: 41% for contributing extra and 38% for investment strategy change. Thus, perceptions of planning importance appear to exert a powerful influence on the acquisition of knowledge. When the influence of PI was investigated for gender, age and income

group differences, results revealed consistent direction, strength and significance of coefficients across all groups (see Tables 5, 6, and 7).

Together, PI and PP accounted for 21% of the variance in extra contribution control perceptions and 28% of the variance in investment strategy change control perceptions. These relations are strong and they confirm key roles for planning constructs in the prediction of perceptions of behavioural control. When investigated across gender, age and income groups (see Tables 5, 6, and 7), results confirm that the influence of PP on PBC for both extra contributions and investment strategy change was consistently positive and significant at the $p < .01$ level. Moreover, observed differences in the size of standardised regression coefficients between gender, age and income groupings were minor. Thus, knowledge appears ubiquitous across demographic groups in its influence on control perceptions for the behaviours studied here. Interpretation of these outcomes should be moderated by the influence that PBC exerts on intention. According to standardised regression coefficients (Figures 1 and 2), the influence of PBC on intention is much greater for extra contributions than for investment strategy change.

6. Discussion

Results confirm the TPB to be a powerful model by which to predict behavioural intentions in the retirement savings domain. We studied the intention to perform two key retirement savings behaviours within an Australian superannuation context. The amount of variance explained in intentions compares favourably to results from application of the theory in other behavioural domains (see, Armitage & Connor, 2001).

The TPB was used as a framework by which to meet the aims of this paper, which were to better understand the relationships among behavioural intentions, PI,

PP (operationalised as domain knowledge), and RT. Our findings suggest that, rather than direct antecedents of intentions, PI and PP variables are less proximal in their influence. Indeed, their influence is mainly transferred to intention via the more proximal PBC construct. Results suggest that, across gender, age and income groups, a sense of planning importance predicts planning preparedness through the acquisition of domain knowledge which, in turn, predicts perceptions of behavioural control and intention. This is an important finding because it places PI and PP variables within the context of the broader PBC construct, which is dependent upon a wider set of determinants.

The PI and PP variables were found to be causally related to respondents' self-reported RT. Both PI and PP, when modelled as antecedents of RT, were significant across all gender, age and income groupings. When modelled as independent variables, age and income were found also to significantly predict RT. Younger respondents with higher income predicted greater tolerance for investment risk. These outcomes must be tempered by the findings that RT significantly (and positively) predicted the intention to change superannuation investment strategy for females of lower age in the lower income range, but not for other females or males in any demographic group. Thus, RT appears to play a minor role in predicting intention. However, predictive significance in investment decisions being confined to the younger, lower income female group is a novel finding, which may have implications for the financial advice industry.

6.1. Future work

According to Lusardi and Mitchell (2007b), financial illiteracy is widespread. Young and older people alike in the United States and other countries appear seriously under-informed about basic financial concepts, with serious implications for

saving, retirement planning, mortgages, and other financial decisions. Fundamental to the illiteracy issue is the question of how literacy is to be measured, as this should guide education efforts. One of the lessons from the study of motivations to perform any given behaviour is the need for specificity of measurement (Ajzen, 2005). Thus, measures of literacy will need to be specific to the particular behaviour of interest, and education program content will need to be accordingly tailored. For example, in the retirement savings field, literacy about the risks of credit card use will not necessarily influence advocated retirement savings behaviours. Thus, parsing of relevant behaviours in the retirement savings domain and developing measurement scales and education programs specific to those behaviours remains an important task for future research efforts.

Because perception of planning importance appears to be a strong antecedent of planning preparedness as well as a direct antecedent of perceived behavioural control, future study of the planning importance construct may benefit from examination the underlying cognitions (beliefs) that shape its valence and strength. Moreover, the field may benefit from future research designed to discriminate differential construct and predictive validity associated with constructs such as perceived planning importance as employed here, compared to other kindred constructs such as future time perspective (Jacobs-Lawson et al., 2004), future orientation (Howlett et al., 2008), propensity to plan (Deaves et al., 2007), and planner mindset (Bhandari & Deaves, 2008).

6.2. Concluding remarks

By mandating employer contributions to superannuation, the Australian government has exercised a paternalistic approach to the problem of retirement savings. Notwithstanding improvements in aggregate and average superannuation

savings levels, a large proportion of Australians remains below targeted retirement savings adequacy levels. The research in this paper examined the motivational antecedents of two key retirement savings behaviours: making extra voluntary contributions and changing savings investment strategy.

The study reveals that greater perceived planning importance and greater planning preparedness (operationalised as domain knowledge) promotes greater perception of behavioural control and that greater control perception promotes greater intention to perform the focal behaviours. Although the two planning constructs were found here to promote greater tolerance for investment risk, the influence of risk tolerance on behavioural intentions was very minor relative to the importance of other predictors of intention. This is an important outcome of the research. The risk tolerance construct is widely employed in the financial advice industry to inform retirement plan asset allocation. These findings suggest that individuals are guided in their behavioural intentions in only modest degree by their self-assessed risk tolerance.

An individual's sense of planning importance and planning preparedness (financial literacy) represent important areas for interventions designed to influence retirement savings behaviour. The present research adds to research in the field by assessing the relative importance of these variables and their causal paths in relation to behavioural intention. The study identifies a powerful mediating role by perceptions of behavioural control for the influences of planning preparedness and planning importance on behavioural intention. A broader view of influencing behaviour in the advocated direction requires paying attention to other influential behavioural antecedents. This paper has highlighted the relevance of perceptions of planning importance and of planning preparedness in influencing perceptions of

behavioural control and intention in the present behavioural domain. However, by varying degrees for each of the behaviours of interest, the mean scores and beta weights of attitude and subjective norm indicate that these two antecedents of intention are also worthy of focus in prospective intervention efforts.

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Figure captions

Figure 1. Standardised regression coefficients for the prediction of the intention to contribute extra to superannuation (Int) from planning importance (PI), planning preparedness (PP), and risk tolerance (RT), controlling for the influence of TPB predictors (Att = Attitude, SN = Subjective Norm, PBC = Perceived Behavioural Control).

Note. Model fit statistics: χ^2 (301, N = 2322) = 1718.56, p < .0001; CFI = 0.956; RMSEA = 0.045; SRMR = 0.053

** = significant, p < .01; * = significant, p < .05.

Figure 2. Standardised regression coefficients for the prediction of the intention to change superannuation investment strategy (Int) from planning importance (PI), planning preparedness (PP), and risk tolerance (RT), controlling for the influence of TPB predictors (Att = Attitude, SN = Subjective Norm, PBC = Perceived Behavioural Control).

Note. Model fit statistics: χ^2 (304, N = 2319) = 2481.06, p < .0001; CFI = 0.936; RMSEA = 0.056; SRMR = 0.074

** = significant, p < .01; * = significant, p < .05.

Table 1

Participant Sample Demographic Profile

Demographic	Sample profile
Males:Females percentage ratio[a]	39:61
Couples:Singles percentage ratio	78:22
Average years of age	45
Average annual income	$55000
Average household income	$87000
Average household mortgage	$70000
Average household net wealth	$404000
Average household superannuation savings balance	$190000

[a]Males, *N* = 916; Females, *N* = 1423.

Table 2

Participant Sample Compared to National Population Occupation Profile

Occupation classification	Sample[a]	Population
Managers	10%	14%
Professional	58%	20%
Technicians, Trade Workers	6%	13%
Community and Personal Service Workers	9%	9%
Clerical and Admin.	11%	16%
Sales Workers	1%	10%
Machinery Operators, Drivers and Labourers	2%	7%
Labourers	3%	11%

[a]N = 2339.

Table 3

Variable Mean Score and Standard Deviation by Focal Behaviour

	Focal behaviour			
	Extra contributions		Investment strategy change	
Variable	Mean	*SD*	Mean	*SD*
Attitude	4.84	1.23	4.48	1.14
Subjective norm	4.20	1.34	3.84	1.20
Perceived control	5.24	1.65	5.90	1.27
Risk tolerance	3.26	0.97	3.26	0.97
Planning importance	5.14	1.40	5.14	1.40
Planning preparedness	4.43	1.54	4.43	1.54
Intention	4.10	2.16	3.66	1.80

Note. Mean scores are based on scales with possible scores ranging from 1 to 7 except for risk tolerance which is based on scores ranging from 1 to 5. N = 2318 for extra contributions, and N = 2316 for investment strategy change.

Table 4

Correlation among Variables by Focal Behaviour

Variable	Correlation coefficient						
	A	SN	PBC	RT	PI	PP	I
Contributing extra to superannuation (*N* = 2322)							
Attitude (A)	-						
Subjective norm (SN)	0.59	-					
Perceived behavioural control (PBC)	0.38	0.35	-				
Risk tolerance (RT)	0.09	0.01*	0.16	-			
Planning importance (PI)	0.24	0.21	0.29	0.26	-		
Planning preparedness (PP)	0.15	0.07	0.33	0.35	0.47	-	
Intention (I)	0.61	0.62	0.57	0.08	0.28	0.17	-
Superannuation investment strategy change (*N* = 2319)							
Attitude (A)	-						
Subjective norm (SN)	0.59	-					
Perceived behavioural control (PBC)	0.16	0.10	-				
Risk tolerance (RT)	0.04	0.03*	0.29	-			
Planning importance (PI)	0.14	0.17	0.28	0.26	-		
Planning preparedness (PP)	0.06	0.03*	0.42	0.35	0.47	-	
Intention (I)	0.61	0.63	0.19	0.13	0.20	0.13	-

*Not significant, $p > .05$.

Table 5

Standardised Regression Coefficient and Standard Error from Structural Equation Modelling for Gender Group by Focal Behaviour

Dependent variable	Independent variable	Male		Female	
		Coefficient	*SE*	Coefficient	*SE*
		Contributing extra to superannuation			
Intention	Attitude	0.33**	0.081	0.15*	0.088
	Subjective norm	0.44**	0.104	0.56**	0.108
	PBC	0.37**	0.064	0.47**	0.054
	RT	0.02	0.047	-0.04*	0.033
PBC	PP	0.35**	0.031	0.35**	0.025
PP	PI	0.58**	0.072	0.66**	0.053
RT	PI	0.21**	0.036	0.26**	0.031
	PP	0.19**	0.057	0.16**	0.043
		Superannuation investment strategy change			
Intention	Attitude	0.44**	0.059	0.08	0.063
	Subjective norm	0.43**	0.085	0.81**	0.093
	PBC	0.12**	0.039	0.06**	0.027
	RT	0.05	0.040	0.06**	0.030
PBC	PP	0.50**	0.038	0.53**	0.033
PP	PI	0.56**	0.073	0.64**	0.055
RT	PI	0.24**	0.034	0.29*	0.029
	PP	0.18**	0.055	0.14**	0.042

Note. Contributing extra to superannuation: male, N = 897, female, N = 1389. Superannuation investment strategy change: male, N = 894, female, N = 1389. PBC = perceived behavioural control; RT = risk tolerance; PP = planning preparedness; PI = planning importance.

* $p < .05$; ** $p < .01$.

Table 6

Standardised Regression Coefficient and Standard Error from Structural Equation Modelling for Age Group by Focal Behaviour

Dependent variable	Independent variable	Under 51 years of age		Over 50 years of age	
		Coefficient	*SE*	Coefficient	*SE*
		Contributing extra to superannuation			
Intention	Attitude	0.26**	0.078	0.22**	0.095
	Subjective norm	0.49**	0.095	0.44**	0.114
	PBC	0.38**	0.052	0.53**	0.063
	RT	-0.01	0.035	-0.01	0.043
PBC	PP	0.37**	0.025	0.32**	0.030
PP	PI	0.63**	0.053	0.66**	0.070
RT	PI	0.33**	0.029	0.18**	0.039
	PP	0.17**	0.040	0.21**	0.060
		Superannuation investment strategy change			
Intention	Attitude	0.20**	0.056	0.27**	0.071
	Subjective norm	0.69**	0.089	0.59**	0.094
	PBC	0.04	0.029	0.12**	0.035
	RT	0.09**	0.030	0.04	0.041
PBC	PP	0.52**	0.032	0.56**	0.040
PP	PI	0.61**	0.053	0.66**	0.073
RT	PI	0.36**	0.028	0.21**	0.039
	PP	0.15**	0.039	0.19**	0.062

Note. Contributing extra to superannuation: under 51 age group, N = 1412; over 50 age group, N = 863. Superannuation investment strategy change: under 51 age group, N = 1411; over 50 age group, N = 861. PBC = perceived behavioural control; RT = risk tolerance; PP = planning preparedness; PI = planning importance.

* $p < .05$; ** $p < .01$.

Table 7

Standardised Regression Coefficient and Standard Error from Structural Equation Modelling for Income Group by Focal Behaviour

Dependent variable	Independent variable	Under $61K group		Over $60K group	
		Coefficient	*SE*	Coefficient	*SE*
	Contributing extra to superannuation				
Intention	Attitude	0.17**	0.064	0.44**	0.141
	Subjective norm	0.53**	0.082	0.34**	0.166
	PBC	0.50**	0.053	0.30**	0.070
	RT	-0.03	0.031	0.00	0.055
PBC	PP	0.31**	0.024	0.38**	0.031
PP	PI	0.64**	0.054	0.61**	0.074
RT	PI	0.24**	0.030	0.24**	0.037
	PP	0.16**	0.042	0.20**	0.057
	Superannuation investment strategy change				
Intention	Attitude	0.14**	0.060	0.36**	0.063
	Subjective norm	0.74**	0.089	0.52**	0.094
	PBC	0.10**	0.026	0.05	0.043
	RT	0.06**	0.028	0.05	0.047
PBC	PP	0.53**	0.033	0.49**	0.038
PP	PI	0.62**	0.055	0.59**	0.075
RT	PI	0.27**	0.029	0.27**	0.035
	PP	0.14**	0.041	0.19**	0.055

Note. Contributing extra to superannuation: under $61K income group, N = 1473: over $60K income group, N = 798. Superannuation investment strategy change: under $61K income group, N = 1472; over $60K income group, N = 796. PBC = perceived behavioural control; RT = risk tolerance; PP = planning preparedness; PI = planning importance.

* $p < .05$; ** $p < .01$.