Retirement Confidence: Development of an Index

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Abstract

Older workers who are confident about the changes accompanying retirement report higher well-being. We have developed an index to measure retirement confidence – the Retirement Confidence Index (RCI). A six-stage approach was used to develop the index items, including (i) a literature review to catalogue retirement confidence components; (ii) a consultation with a panel of experts to review the proposed indicators and combine components according to their meaning; (iii) normalisation of the selected components to make them comparable; (iv) weighting of the top-level dimensions using experts' judgement; (v) linear aggregation of the dimension scores according to their corresponding relative weight; and (vi) correlation of the composite score with a self-report measure of retirement confidence. Based on the review of the literature, a list of nine sub-components (financial literacy, financial attitude and behaviour, financial control, financial anxiety, physical health, mental health, social connectedness, goal setting for retirement and future uncertainties) was compiled. Subsequently, these components were grouped into four broad dimensions. Correlations between these dimensions (social, financial awareness and skills, health and well-being, and retirement awareness and planning dimensions) and the corresponding self-reported measures were as high as r = 0.555, r = 0.603, r = 0.591 and r = 0.569, reflecting 30.8%, 36.3%, 34.9% and 32.3% shared variance with the corresponding self-reported indices, respectively. The Retirement Confidence Index provides the foundation for future research to measure retirement confidence, with the aim of identifying deficient RCI dimensions and directing efforts to targeted policies to ensure older workers are confident about retirement.

What do we already know about this topic?
- The more confident an individual is about retirement as the next life stage, the better able they will be to adjust to the new experiences of retirement, as well as the challenges associated with this major life transition.

How does your research contribute to the field?
- Our study devised the first unified multidimensional measure of retirement confidence, which aims to offer a comprehensive and quantified expression for a complex composition of several components underlying retirement confidence.

What are your research's implications towards theory, practice or policy?
- Our Retirement Confidence Index (RCI) provides the foundation for future research to measure retirement confidence across individuals over time, with the aim of identifying deficient RCI dimensions among segments of the population and directing efforts to targeted policies.

Introduction

The length of life expectancy is being continuously extended in industrialised countries.[1] Among other consequences, this demographic trend is also significantly increasing the number of retirement years.[2] For instance, when Social Security was introduced in the United States in 1935, the minimum age to retire was 65 years old despite the fact that life expectancy was 60 years old.[3] Although an American can retire at the age of 66 in 2021, life expectancy in the United States is 78 years old.[4] This is in line with other industrialised countries, such as Australia and some European countries, showing that retirement has become a long and meaningful phase in the lives of older adults worldwide.[5] This demographic trend affects lifetime benefits from Social Security and health programs as well as individual's perception of whether they will have access to financial, social and health resources post-retirement.[5,6] Therefore, as retirement becomes a more significant and longer phase of our lives, it is key to better understand how confident older workers feel to make the transition to retirement as well as how confident retirees feel during the retirement experience.

Retirement confidence and retirement preparedness have often been used interchangeably in the literature.[7] These constructs have been defined as feeling prepared and ready to make the transition to retirement or feeling prepared and confident during the retirement experience.[8] However, most recent measurements of retirement confidence have been restricted to a financial assessment of an individual's situation, with a focus on factors that are beyond the individual's control.[9] These studies have associated retirement confidence with the ability to live comfortably in retirement, financial preparation and the ability to cover medical expenses and basic expenses during retirement.[9] A comprehensive understanding of retirement confidence (rather than financial confidence) can be used to identify groups of older workers most in need of assistance and to develop evidence-based programs to improve confidence about retirement.[9] Older workers who are fully confident about the changes accompanying retirement report better adjustment to retirement and higher well-being post-retirement.[8] That is, the more confident an individual is about retirement as the next life stage, the better able they will be to adjust to the new experiences of retirement, as well as the threats and challenges associated

with this major life transition, such as the loss of the social ties associated with work.[7,10]

To date, attempts to measure retirement confidence have drawn upon research on retirement adjustment and are limited to studies examining a single or a small number of components of retirement confidence. These components can be summarised in 3 broader categories: (i) financial skills and preparedness, such as financial literacy, financial control and an individual's ability to afford life expenses during retirement; (ii) retirement planning, including goal-setting and (iii) health and well-being factors.[7,11-13] Financial literacy may hamper financial decision-making and retirement planning.[14] In turn, lack of retirement planning decreases the individual's confidence in their ability to undertake the task (i.e. retirement), which leads to low confidence in retirement.[15] Further, health problems restrict the possibilities of taking up new leisure and social activities during retirement, which may decrease retirement confidence.[16]

Evidence indicates that financial planning and well-being factors define independent but intercorrelated dimensions of retirement confidence.[8] For instance, retirement planning appears to serve a number of health and well-being factors. Specifically, planning for retirement is associated with lower anxiety, depression and stress levels.[17] Further, financial skills and awareness are positively associated with retirement planning, with lack of financial knowledge and financial anxiety being associated with poor retirement planning.[7] In this context, retirement confidence is about the combination of intercorrelated situational and personal factors (e.g. financial literacy and health and well-being) in a variety of aspects of an individual's life. These multiple indicators, such as financial skills, planning and well-being, express critical aspects of retirement confidence but no single one of them fully captures this construct.[18] Despite that, previous studies have not assessed the multidimensional nature of retirement confidence within a single sample. To resolve this gap in knowledge, the current study addresses the multidimensional nature of retirement confidence by developing a meaningful composite score of individual indicators (rather than constructing a scale) to measure confidence as people move towards retirement and throughout the retirement years.

Research supports the need for investigation of retirement confidence during the retirement years, in addition to the pre-retirement phase.[19] This is because of the dynamic nature of retirement confidence.[9] Feeling confident about retirement before the transition may be quite different from confidence after becoming a retiree and throughout retirement. Before the transition to retirement, confidence is contingent on the individual's understanding of whether they will have access to financial, social and health resources post-retirement. For instance, individuals who are less confident in the future of social security and health care programs are less confident about their own retirement security.[18] As pre-retirees transition to retirement, and beliefs about retirement as well as the

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actual retirement experience change, it is expected that retirement confidence will change as well.[20]

The aim of this article is to fill a gap in retirement readiness assessment and develop an index of retirement confidence derived from the recognition that retirement confidence has a multidimensional nature, including non-financial aspects, and that retirement confidence is a dynamic and ongoing process.

While the current study was conducted in Australia, the development of the index and the research reviewed for this study were based on past studies conducted around the world and, therefore, have practical implications to support older workers and retirees in other industrialised countries.

Method

Developing Measurement Instruments

The main motivation for developing a psychometric measure is to produce a valid measure of an underlying construct.[21] Given the multidimensionality of retirement confidence, an index is a suitable instrument to measure this construct.[22] Where a scale measures the strength of a particular indicator or variable (e.g. financial literacy), an index is formed when individual indicators or components (e.g. financial awareness and skills and health and wellbeing) which represent an underlying construct (e.g. retirement confidence) are compiled into a composite indicator.[23] The use of composite scores enables users to understand trends in complex scenarios to support evidence-based decision-making.[23]

According to the OECD Handbook on Constructing Composite Indicators (2008), the process of developing an index or composite indicator includes selection of indicators, normalisation of indicators as well as weighting and aggregation.[24,25] Firstly, the indicators should be chosen carefully according to the underlying conceptual framework, and it is recommended to involve experts and relevant stakeholders at this stage to ensure indicators are relevant to the phenomenon being measured. Normalisation is often needed before data aggregation as selected indicators frequently have different measurement units.[24] Subsequently, indicators should be weighted and aggregated. Weighting refers to the significance that is attributed to each component of a composite index, and demonstrates its importance relative to the other components of the measure.[24] There are several approaches in the literature to make this process as simple and effective as possible.[25] Some of these approaches involve a single or several stakeholders deciding on the weighting scheme to be chosen. Stakeholders include practitioners and academic experts as well as policymakers.[25] This is followed by the next step in developing a composite index: aggregation. The aggregation process consists of aggregating indicators to relevant domains and then aggregating these domains to a composite index. Aggregation methods can be divided into compensatory and non-compensatory approaches, such as multi-criteria analysis.[26]

Among the compensatory aggregation approaches, the linear aggregation is the most commonly used when developing composite scores.[23] The linear aggregation method is applicable when all individual indicators were normalised or have the same measurement unit.[23] Further, it is recommended to correlate the composite index with other frequently used indicators and identify linkages between the composite indicator and other relevant measures. These links are useful to assess the explanatory power of a composite index.[24]

The method employed for this study combines both qualitative and quantitative research methods to strengthen validity. The method employed consisted of a six-stage process that involved: (i) a literature review to catalogue retirement confidence components from previous studies; (ii) a consultation with a panel of experts to review the proposed indicators and combine components according to their meaning; (iii) normalisation of the selected components to make them comparable; (iv) weighting of the top-level dimensions using experts' judgement; (v) linear aggregation of the dimension scores according to their corresponding relative weight into a composite index model; and (vi) correlation of the composite score with a self-report measure of retirement confidence.

Literature Review

Existing studies on retirement confidence are increasingly shifting from being fundamentally conceptual, towards a greater focus on empirical research. As a result of this, some instruments to measure retirement confidence have been developed in the last 2 decades. Among these instruments, the Retirement Confidence Survey (RCS) is the most commonly used measure.[9] The RCS measures retirement confidence as well as the views and attitudes of working-age and retired Americans regarding retirement and their preparations for retirement. Specifically, it includes confidence about (i) the ability to live comfortably in retirement, (ii) financial preparation that they are engaging as pre-retirees, (iii) the ability to cover medical expenses during retirement, (iv) the ability to cover basic expenses and (v) the ability to cover expenses throughout their life expectancy.[9] Accordingly, low retirement confidence defines the perception of insufficient resources to cover basic expenses during the retirement years. Although the Retirement Confidence Survey (RCS) and other existing measures of retirement confidence provide an assessment of the perceived adequacy of financial resources to maintain an individual's standard of living during retirement, they do not take into consideration the non-financial aspects which underlie the individual's ability to have confidence in their retirement.

The current research undertook a literature review to catalogue retirement confidence components from existing studies. However, there is a limited range of empirical studies that provide retirement confidence indicators. As a result of this, the selection of studies to review the components of

retirement confidence had to be broadened to account for indicators of retirement decisions and outcomes, including early or voluntary retirement, adjustment to retirement and satisfaction and well-being post-retirement.

Based on a review of the literature, a list of 9 sub-components (financial literacy, financial attitude and behaviour, financial control, financial anxiety, physical health, mental health, social connectedness, goal setting for retirement and future uncertainties) was compiled. A review of these components is presented below.

Financial literacy. Financial literacy is defined as the ability to make informed judgements and effective financial decisions.[27] It has been shown that financial literacy is a precursor of healthy financial behaviours, such as lower levels of financial anxiety, as well as higher engagement in retirement planning activities and retirement confidence.[12,18,27,28] This is because financial literacy lowers the costs of collecting and processing information required for planning, and consequently simplify financial decision-making and retirement saving calculations.[14] There is also a link between financial literacy and expectations of stock market performance, superannuation savings, prevention of financial hardship and wealth accumulation, even after controlling for key determinants of wealth, such as income, age and education.[14,29,30] Individuals who receive workplace financial education and advice are more confident in their retirement than others.[18] In this context, individuals who have higher levels of financial literacy feel more prepared to make the transition to retirement.

Financial attitudes and behaviours. Several factors shape an individual's financial attitudes, beliefs and behaviour. Among these factors, the personal sense of control over one's financial circumstances is particularly important in the context of retirement well-being.[31] Feeling in control over one's financial situation leads to a sense of freedom to make decisions about the retirement years, even for those individuals with fewer financial resources.[31] The personal sense of control over our financial situation can be illustrated by a spectrum, which at one end is the perception that one can control conditions of their lives, and at the other end, is a belief that life circumstances are shaped by external factors.[32] The belief that the future is in the individual's control has a positive impact on retirement confidence and well-being and, therefore, on how prepared an individual feels about the transition to retirement.[33]

Feeling in control of our financial security is associated with reduced financial anxiety and a sense of freedom to make decisions about the future, including deciding when may be the best time to retire.[31] A recent longitudinal study found an association between higher financial control and voluntary retirement among older workers, which leads to better mental health conditions during retirement.[34] Conversely, involuntary retirement, which is often associated with financial

distress as a consequence of an unplanned transition, could lead to poor mental health conditions through lower financial control.[34] The literature also suggests that the personal sense of control of our lives and financial circumstances plays a protective factor among financially vulnerable workers.[35] Specifically, older workers experiencing financial distress report improvements in life satisfaction post-retirement if they have access to resources that facilitate greater control over their lives.[35] Conversely, financially vulnerable individuals who feel little control over their finances experience significant deterioration of well-being following retirement. This is because they rely on insufficient financial resources or are less likely to feel that they are able to prepare for important aspects of their lives, such as leisure and social activities.[35]

Financial control. The ability to self-regulate impulses, is a key predictor of success in most areas in life that requires long-term planning.[36] This seems to be true also for financial attitudes and behaviours.[37] Individuals who have high levels of self-control over their finances are more willing to save and more careful towards financial decisions in favour of long-term goals.[38] Research has also shown that individuals who are more willing to save are more confident in their retirement and, therefore, they feel more prepared to make the transition to retirement.[18]

The literature suggests that financial control or the willingness to save money for future needs is influenced by several psychological and behavioural aspects.[39] Individuals who show interest in the financial domain, have high levels of financial literacy, and who believe that they can influence events and conditions of their lives are more likely to save regularly.[39] There is also evidence that financial control impacts an individual's perception of his/her objective wealth (e.g. income, assets and debts). Specifically, the relationship between objective and subjective indicators of wealth (individual's income and perceived financial situation, respectively) is stronger among individuals high in control over their finances.[38] This is because individuals who demonstrate higher self-control assess their financial circumstances based on objective measures, such as their actual income and expenses, rather than perceived adequacy of their income to fulfil their needs.[38]

Financial anxiety. Financial anxiety has been defined as a psychological condition in which individuals have unhealthy attitudes towards managing their financial situation.[40] Anxiety towards engaging with one's personal finance has a negative impact on retirement planning and savings behaviour and, as a result of this, in retirement confidence.[41] Specifically, financial anxiety decreases retirement savings, even after controlling for financial goals and financial motivation.[42] There is also research suggesting that financial anxiety deteriorates health and well-being which, in turn, might lead to poor retirement confidence.[18,43] Research has

shown that financial anxiety is predicted by both financial confidence and financial competence (i.e. subjective and objective financial knowledge, respectively). However, a recent study has suggested that financial confidence, regardless of competence, has a positive effect on financial anxiety.[44] Individuals with financial confidence are more likely to perceive financial decisions as challenges to be overcome instead of threats that should be avoided.[44] Conversely, individuals with low financial competence show higher financial anxiety because they may lack financial knowledge to make informed decisions.[45] As a result of this, financial anxiety has been associated with unwarranted risk aversion and poor financial decisions and retirement outcomes.[46]

Physical health. An older worker and retiree's physical well-being can be defined as the extent to which there is absence of physical diseases (e.g. lung disease) and somatic symptoms, such as sleep disturbance and headaches.[19] There is a positive association between pre-retirement physical health and well-being during the retirement years, as health predicts better adjustment to the retirement transition.[16] In line with this, better health is positively associated with retirement confidence and, therefore, feeling more prepared and ready to make the transition to retirement and confident during the retirement experience.[18] Conversely, poor functional health may increase financial anxiety and decrease retirement confidence.[18,19] This is because some health problems may raise concerns about an individual's ability to fulfil tasks of daily living and, therefore, increase concerns about the financial costs of such diseases.[19] Further, poor physical health restricts the possibilities of taking up new activities during the retirement years and, therefore, may interfere with the individual's ability to engage in social activities.[19,47]

Previous research has shown that physical health also influences retirement decisions, including deciding when it is the appropriate time to retire.[48] Older workers who have good health are more likely to retire when planned and to engage in bridge employment rather than full retirement.[48] Conversely, workers with health problems are more likely to retire earlier than anticipated.[49] Health problems also predict involuntary retirement, which may hamper adjustment to retirement, retirement satisfaction and retirement confidence.[47]

Mental health. An older worker and retiree's mental health can be defined as the individual's resources for positive emotional, psychological and social well-being.[19] There is a positive association between pre-retirement mental health and retirement adjustment, as the regulation of well-being positively influences adaptation to the retirement transition.[16] Conversely, poor mental health is associated with poor retirement savings decisions, which may lead to decreased retirement confidence.[18] Specifically, poor mental health significantly decreases the probability of an individual having a retirement savings account.[50] Further, poor mental health

could potentially exacerbate problems that future retirees already had to manage their retirement savings , which can decrease retirement confidence.[50]

Research has shown that mental health also influences retirement decisions. Specifically, there is longitudinal evidence showing that depressive symptoms increase the probability of retirement and disability pension.[51] Depressive symptoms, particularly low energy levels and the lack of focus and concentration, can decrease work productivity and lead to involuntary retirement.[51] Therefore, depressive symptoms can lead to a lack of confidence in the transition to retirement or during the retirement experience.[19]

Social connectedness. Social connectedness can be defined by an individual's number and quality of connections.[52] The literature suggests that social connectedness influences important retirement outcomes. Specifically, there is longitudinal evidence showing that the quality of social interactions and the type of social support predict retirement satisfaction among retirees 10 months after the post-employment period.[16,53] The presence of family, friendship and community affiliations also contribute to retirement well-being and adjustment.[53] Strong social networks sustain older workers' well-being by enabling individuals to overcome stressful situations and promoting adaptation to retirement and higher retirement confidence.[54]

The transition to retirement involves several lifestyle changes, including changes in the individual's social environment.[19] When not daily engaged in the workplace, developing and maintaining social networks may require more effort.[47] For those individuals who did not feel socially integrated during the employment years, the retirement transition could lead them to confront their lack of meaningful social networks.[51] Further, fear of the social consequences of the retirement transition, particularly the loss of work colleagues, is associated with poor adjustment to retirement.[47]

There is also evidence that social connectedness has an impact on the retirement transition.[52] After the age of 60, the transition is 35% higher among workers who frequently meet with their friends and family compared with workers who do not have positive social networks. Among workers in their 50s, being active in community associations is linked to a 25% reduction in the likelihood to retire earlier than planned.[52] These findings suggest that community participation is associated with delayed retirement due to the social benefits of volunteering.[52]

Goal setting for retirement. Research has shown that retirement preparations predicts retirement confidence as well as other important retirement outcomes, such as more positive well-being, greater financial security, life satisfaction and adjustment post-employment.[33,55,56] Psychological theories suggest that retirement planning influences retirement well-being by allowing older workers to develop realistic

expectations of retirement.[57] Further, according to Bandura's self-efficacy theory, preparing for retirement increases the individual's confidence in their capacity to undertake the task (i.e. retirement) because planning enhances readiness.[15]

There is evidence showing that understanding what retirement involves and having knowledge of retirement planning is positively associated with attitudes towards retirement (Kim et al, 2005). Specifically, calculating retirement fund needs, having discussions about retirement with family and friends and confidence in one's financial skills lead to advanced retirement planning activities.[18,56] Individuals who believe they know more about financial planning are more likely to have prepared for retirement and, therefore, to feel ready to make the transition to retirement.[45]

Another psychological construct that has been associated with advanced retirement planning activities is retirement goal clarity.[42,58] The formation of clear retirement goals is one of the most crucial steps older workers can take when initiating a formal retirement plan.[59] Setting up clear goals for retirement helps future retirees better understand their expectations and motivations about planning, which, in turn, influences saving activities and retirement confidence.[58,60]

Future uncertainties. Planning for retirement requires an individual to make decisions in the present that maximise well-being during the post-employment period.[33,55,56] Such decisions are often referred to as intertemporal choices.[61] One of the key antecedents of intertemporal decisions is an individual's sense of emotional connection with his or her future self.[61] Feeling a greater emotional connection with one's future self leads to decisions that maximise long-term goals.[62,63] Specifically, research has shown that individuals who feel more emotionally connected to their future selves accumulate more assets and make long-term decisions on financial savings tasks.[64,65] The extent to which people feel connected with their future selves influences their willingness to save by making them recognise that they are the future recipients.[64] Conversely, a consequence of disconnection is that the future self is treated as a stranger and, as a result of this, individuals are more likely to make short-term decisions rather than decisions that maximise financial well-being during retirement, which in turn may decrease retirement confidence.[66]

Consulting With a Panel of Experts

The initial literature review identified the 9 components proposed to comprise retirement confidence – financial literacy, financial attitude and behaviour, financial control, financial anxiety, physical health, mental health, social connectedness, goal setting for retirement and future uncertainties. Based on the recommendations proposed by OECD,[24] the next step was to consult a panel of experts to review the components and identify conceptual groupings. In total, 5 independent experts in retirement confidence from a large Australian superannuation company, 2 universities and a large government-funded research organisation reviewed the proposed RCI components compiled from the literature review. The review involved combining components into conceptual groups based on their meaning and relevance to retirement confidence.

The panel of experts included individuals with experience in retirement well-being, retirement incomes policies, retirement planning and financial education. Each expert was sent a copy of the literature review and proposed components and then interviewed to collect their feedback. In response to comments, the components were grouped into 4 broad dimensions (see Table 1) and well-validated measures of the components were proposed. The 4 dimensions identified by the panel of experts were Financial Awareness and Skills, Health and Well-being, Social factors and Retirement Awareness and Planning.

The dimensions of Financial Awareness and Skills, Retirement Awareness and Planning, and Health and Well-Being are traditionally incorporated into research on retirement confidence, retirement preparedness, post-retirement satisfaction and retirement adjustment indices.[7,17] However, research on the importance of social factors is an emerging area of retirement confidence indices. We regard all these dimensions as independent and intercorrelated factors of retirement confidence.

It is worth noting that all experts considered all selected components (e.g. mental health and physical health) as equally important to the corresponding dimensions (e.g. health and well-being).

Validation of the Index

To validate the components our retirement confidence index, a survey was conducted with an Australian sample in 2017. The scales for measuring the underlying components of the proposed index were derived from the literature review and the expert panel's feedback. The survey also included some socio-demographic questions such as respondent age, gender, education level and retirement status, as well as a self-report direct measure of retirement confidence. The self-report measure of retirement confidence consisted of 4 items administered in the form of Likert-type statements with disagree/agree responses: (i) I am financially prepared for retirement at the intended retirement age; (ii) I am confident that I will be adequately healthy during my retirement; (iii) I am confident that I will maintain a good social life during my retirement; and (iv) I am confident that I will have a fulfilling life during my retirement.

The target population for the survey were older Australians who were either retired or approaching retirement (i.e. aged 50 years or older). The survey was distributed online via an online panel provider, who randomly sampled eligible

participants from their panel of members (representative on age, gender and location) and emailed an invitation to complete the survey. This research was approved by the author's University Human Research Ethics Committee (CF16/2201-2016001096). Participants consented to participate in this research by completing the study questionnaire; however, they could choose to withdraw from the study while they were completing the questionnaire.

Before distribution, the survey was piloted with a sample of 321 participants (mean age: 65.4; 53% female). In response to feedback from the pilot, minor changes were made to improve the clarity of some of the questions. In total, 1516 adults (n = 774 pre-retirees and n = 742 retirees) living in Australia, aged between 50 and 90 years old, were recruited to complete the final version of the survey. Participants' socio-demographic characteristics are displayed in Table 2. The inclusion criteria were defined as being older than 49 years old.

Table 3 presents an overview of the measures selected to assess each of the RCI components. All questionnaires represented pre-validated scales. Most of these scales were administered in the form of Likert-type statements with disagree/agree, never/always or not at all/all the time responses.

Table 1. Dimensions identified by the panel of experts.

Dimension	Component
Financial Awareness and Skills	Financial literacy
	Financial anxiety
	Financial behaviour and attitudes
	Financial control
Health and Well-Being	Mental health
	Physical health
Social Factors	Social connectedness
Retirement Awareness and Planning	Goal setting
	Future uncertainties

Table 2. Socio-demographic characteristics of participants.

	Pre-Retiree	Retiree
Age	57.69 (6.27)	68.33 (7.13)
Gender (male)	41%	54%
Education level		
Under year 12	26%	27%
High school degree	27%	30%
University degree	47%	43%
Australian born	25%	30%
Married or in a de facto relationship	68%	63%
Home owner	76%	79%
Household income	US$81,368	US$51,132

Note: Findings are presented as 'Mean (Standard deviation)' for scale variables and 'Column %' for categorical variables.

Weighting of the Proposed RCI Dimensions Using Experts' Judgement

In order to combine information from many underlying dimensions into 1 index, a key step is to assign a weight to each proposed dimension (e.g. Financial Awareness and Skills and Social Factors) identified by the consulted experts.[25] A commonly used method for obtaining dimension weights is *Budget allocation*. Based on this technique, a selected panel of experts is given a budget of points, to distribute over a number of dimensions of an index, paying more for those indicators whose importance they would like to stress.[23] The *Budget allocation* technique can be divided into 4 phases: (1) selection of experts with a wide spectrum of knowledge and experience for the valuation, (2) allocation of budget to the different dimensions of the index, (3) calculation of the weights and (4) iteration of the budget allocation until convergence is achieved.[23]

Based on the *Budget allocation* technique, 5 experts from different fields (retirement well-being, retirement incomes policies, retirement planning and financial education) were asked about the importance of each of the proposed dimensions (*Financial Awareness and Skills, Health and Well-Being, Social factors and Retirement Awareness and Planning*). Each of the experts had to distribute 100 points over the 4 proposed dimensions of the index, paying more for those dimensions whose importance they would like to stress. The final weights were obtained computing the median of the distribution of responses (standardised to sum to 100). Financial Awareness and Skills and Health and Well-Being received a weight of 30% each while Social Factors and Retirement Awareness and Planning received a weight of 20% each.

Calculating the Index

Following the weighting of the proposed dimensions using experts' judgement, the dimension scores were linearly aggregated according to their corresponding relative weight into a composite index model.

Firstly, all the items used to measure each of the RCI components were combined to generate each normalised component score ($\bar{x}_c$) from the survey responses using equation (1).

$$\bar{x}_c = \frac{\left(\sum_{i=1}^{n_c} x_n - k_c\right) \times 100}{(k_c \times s_c) - k_c} \quad (1)$$

Where $\bar{x}_c$ = normalised component score, x_n = component score, n_c = last value of last item used to measure the component, k_c = number of questions used to measure the component and s_c = number of response options (measurement scale) for each of the questions used to measure the component.

The individual normalised component scores represent the indicators of retirement confidence associated with the dimension elements (e), including financial awareness and

Table 3. Overview of selected measures.

RCI Component	Sub-Component	Instrument	Measurement Scale	Items
Financial Awareness and Skills	Financial literacy	Lusardi (2019)[68] Tahir et al. (2021)[73]		"Suppose you had US$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money grow?"
				"Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account?"
				"Do you think that the following statement is true or false? 'Buying a single company share usually provides a safer return than an index fund".
				"Suppose you had US$100 in a savings account, the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have on this account in total?"
				"Assume a friend inherits US$10,000 today and his sibling inherits US$10,000 3 years from now. Who is richer because of the inheritance?"
				"Suppose that next year, your income has doubled and prices of all goods have doubled too. Next year, how much will you be able to buy with your income?"
	Financial attitude and behaviour	Financial attitudes and behaviours items from the Retirement Confidence Survey[67]	Seven-point Likert-type scale (1 = strongly disagree; 7 = strongly agree)"	"Just when I think I have a handle on my finances, something always happens that sets me back from my financial goals".
				"I am disciplined at saving".
				"I frequently spend money when I do not plan to buy anything".
				"I pay off my credit cards at the end of every months".
				"I always research and plan for a big purchase".
				"I enjoy financial planning".
	Financial control"	Short version of the Money Attitudes Questionnaire[38]	Five-point Likert-type scale (1 = strongly disagree; 5 = strongly agree)	"I have close control over the state of my money and savings".
				"I choose to save money, because you never know when a rainy day will come".
				"I am proud of my ability to save money".
				"I firmly stick to my budget".
				"I try to manage my money prudently and carefully".
				"I put aside money for the future".
	Financial anxiety	Financial Anxiety Scale[69]	Seven-point Likert-type scale (1 = never; 7 = always)	"I feel anxious about my financial situation".
				"I have difficulty sleeping because of my financial situation".
				"I have difficulty concentrating on my school or work because of my financial situation".
				"I am irritable because of my financial situation".
				"I have difficulty controlling worrying about my financial situation".
				"My muscles feel tense because of worries about my financial situation".
				"I feel fatigued because I worry about my financial situation".

(continued)

Table 3. (continued)

RCI Component	Sub-Component	Instrument	Measurement Scale	Items
Health and Well-Being	Physical health	Physical Health Questionnaire[70]	Seven-point Likert-type scale (not at all=1, all the time=7)	"Have you had difficulty getting to sleep at night?" "Have you woken up during the night?" "Have you had nightmares or disturbing dreams?" "Has your sleep been peaceful and undisturbed?" "Have you experienced headaches?" "Did you get a headache when there was a lot of pressure on you to get things done?" "Did you get a headache when you were frustrated because things were not going the way they should have or when you were annoyed at someone?" "Have you suffered from an upset stomach (indigestion)?" "Did you have to watch what you ate carefully to avoid stomach upsets?" "Did you feel nauseated ('sick to your stomach')?" "Were you constipated or did you suffer from diarrhoea?" "Had minor colds (that made you feel uncomfortable but did not keep you sick in bed or make you miss work)?" "Had respiratory infections more severe than minor colds that 'laid you low' (such as bronchitis, and sinusitis)?" "When you had a bad cold or flu, how long did it typically last?"
	Mental health	Mental Health Continuum-Short Form[71]	Six-point Likert-type scale (never =0; almost every day, or every day=5)	"Happy" "Interested in life" "Satisfied with life" "That you had something important to contribute to society" "That you belonged to a community (like a social group, or your neighbourhood)" "That our society is a good place, or is becoming a better place, for all people" "That people are basically good" "That the way our society works makes sense to you" "That you liked most parts of your personality" "That you are good at managing the responsibilities of your daily life" "That you had warm and trusting relationships with others" "That you had experiences that challenged you to grow and become a better person" "That you were confident to think or express your own ideas and opinions" "That your life has a sense of direction or meaning to it"

(continued)

Table 3. (continued)

RCI Component	Sub-Component	Instrument	Measurement Scale	Items
Social Factors	Social connectedness	The Social Connectedness Scale[72]	Six-point Likert-type scale (1 = strongly disagree; 6 = strongly agree)	"I feel disconnected from the world around me". "Even around people I know, I don't feel that I really belong". "Even around people I know, I don't feel that I really belong". "I have no sense of togetherness with my peers". "I don't feel related to anyone". "I catch myself losing all sense of connectedness with society". "Even among my friends, there is no sense of brother/sisterhood". "I don't feel I participate with anyone or any group".
Retirement Awareness and Planning	Goal setting for retirement	Goal Clarity Scale[58]	Seven-point Likert-type scale (1 = strongly disagree; 7 = strongly agree)	"I set specific goals for how much I need to save for retirement". "I think a great deal about quality of life in retirement". "I have a clear vision of how life can be in retirement". "I set clear goals for gaining information about retirement". "I discussed retirement plans with my spouse, friend or financial advisor".
	Future uncertainties	Clarify of Future Self Scale[62]	Six-point Likert-type scale (1 = not true at all for me; 6 = completely true for me)	"Images of myself in the future are very hazy and not clear at all". "My future seems vague and uncertain to me". "When I picture myself in the future, I see clear and vivid images". "I really find it hard to predict what I might be like in the future". "My future is too uncertain for me to plan very far ahead".

skills (x_{fa}), health and well-being (x_{hwb}), social factors (x_{sf}) and retirement awareness and planning (x_{rap}).

The dimensions scores (x_{dm}) can be computed each as a function of normalised individual component $(\overline{x}_c)$ scores as shown below

$$x_{dm} = \frac{\sum_{i=1}^{k_{dm}} \overline{x}_c}{w_{dm}} \qquad (2)$$

Where x_{dm} = dimension score, k_{dm} = last value of last component used to measure the dimension and w_{dm} = number of components associated with dimension.

Further, the Retirement Confidence Index (RCI) is computed by aggregating dimension variables (Equation (2)) with the corresponding domain relative importance weight (co-efficient) using Equation (3)

$$RCI = \sum \left(X_{fa} \times 0.3 + X_{hwb} \times 0.3 + X_{sf} \times 0.2 + X_{rap} \times 0.2 \right) \qquad (3)$$

Where RCI = Overall retirement confidence index score, x_{fa} = score for the financial awareness and skills dimension,

x_{hwb} = score for the health and well-being dimension, x_{sf} = score for the social factors dimension and x_{rap} = score for the retirement awareness and planning dimension.

After calculating the index, we conducted t-test analyses to assess the statistical significance of any differences between means of pre-retirees and retirees as well as female and males on the 9 RCI components and the overall RCI score. Further, we performed correlation analysis between the overall RCI score and the corresponding self-report measures of retirement confidence. Pearson correlations were used to explore these associations in SPSS, with a significant threshold of P < .001.

Results

Table 4 shows the means and standard deviations of female and male pre-retirees and retirees on each of the 9 RCI components as well as the overall retirement confidence index score on a scale of 1–100.

Results suggest that retirees are significantly more confident about retirement than pre-retirees ($t = 6.04$, $p = <.001$).

The superior performance of retirees can be observed in the 4 dimensions of the index (Social Factors, Financial Awareness and Skills, Health and Well-Being, and Retirement Awareness and Planning).

There was a significant difference between female and male pre-retirees, with male pre-retirees performing significantly better overall ($t = 2.81$, P = <.005), on financial literacy ($t = 7.37$, P = <.001), financial anxiety ($t = 2.23$, P = .02), financial attitudes and behaviours ($t = 1.97$, P = .04), physical health ($t = 4.61$, P = <.001), goal setting ($t = 2.66$, P = .007) and future uncertainties ($t = 2.06$, P = .03). There was also a significant difference between female and male pre-retirees, with male pre-retirees performing significantly better on financial literacy ($t = 5.98$, $p = $ <.001), financial anxiety ($t = 2.00$, P = .04), financial attitudes and behaviours ($t = 2.03$, P = .04) and physical health ($t = 3.01$, P = .002).

Evidence Based on the Association With Self-Report Measures

Table 5 presents correlational analysis between the 4 dimensions of the Retirement Confidence Index (Social factors, Financial Awareness and Skills, Health and Well-Being, Retirement Awareness and Planning) and the corresponding self-reported measures of social, financial, health and fulfilment aspects of retirement.

Correlations for the RCI dimensions and the 4 facets of self-reported retirement confidence ranged between .553 and .616. In addition to health, the health and well-being dimension of the Retirement Confidence Index was strongly correlated with the social and fulfilment facets of the self-reported retirement confidence measure. In addition to fulfilment, the retirement awareness and planning of the Retirement Confidence Index was strongly correlated with the financial facet of the self-reported retirement confidence measure. The RCI overall score was strongly correlated with the self-reported retirement confidence measure.

Discussion

This study devised the first unified multidimensional measure of retirement confidence, which is an under-represented area in the retirement literature. The purpose of the Retirement Confidence Index (RCI) is to offer a comprehensive and quantified expression for a complex composition of several components underlying retirement confidence. In such a manner, the RCI provides the foundation for future research to measure retirement confidence across individuals over time, with the aim to identify deficient RCI dimensions among segments of the population and direct efforts to targeted policies to ensure older workers are fully confident as they move towards retirement and, subsequently, throughout the retirement years.

Our study selected the components proposed to comprise retirement confidence from the existing literature. As

recommended by OECD,[24] a panel of experts was consulted to ensure the selected components represented key aspects of retirement confidence. Next, a panel of experts combined the proposed components into dimensions according to their meaning. Based on the budget allocation technique, the 4 proposed broad dimensions were weighted using experts' judgement. The index was validated through an online survey distributed to a large random sample of Australian older workers and retirees (representative on age, gender and location).

Importantly, studies capturing all 4 dimensions underlying retirement confidence (Social, Financial Awareness and Skills, Health and Well-Being, and Retirement Awareness and Planning) have not been systematically assessed within a single sample. Our findings reveal the utility of the RCI in providing a comprehensive and valid measurement of the components underlying retirement confidence among older workers as well as retirees. Performance on all index components significantly differs between pre-retirees and retirees, with retirees demonstrating higher retirement confidence. The current results support previous research, which has shown that people feel more confident as they transition to retirement.[20] Our findings are also in agreement with past literature showing that working men have higher levels of retirement confidence than women.[67] Further, the 4 dimensions of the RCI showed significant association with the scores of self-reported measures of the same thematic network. Correlations between the social, financial awareness and skills, health and well-being, and retirement awareness and planning dimensions of the RCI and the corresponding self-reported measures were as high as r = .555, r = .603, r = .591 and r = .569, reflecting 30.8%, 36.3%, 34.9% and 32.3% shared variance with the corresponding self-reported indices, respectively. This pattern of correlations was mostly consistent with original assumptions, as the social and the financial awareness and skills dimensions of the RCI were most strongly correlated with the social and financial facets of the self-reported measure. However, the Health and Well-Being dimension of the RCI was strongly correlated not only with the self-reported health measure but also with the social and fulfilment facets of self-reported retirement confidence. This is consistent with previous studies showing that health problems may raise concerns about an individual's capacity to fulfil tasks of daily living and restrict the possibilities of taking up new social activities during the retirement years.[47] Further, the Retirement Awareness and Planning dimension of the RCI was strongly correlated with the self-reported financial aspect of retirement confidence in addition to the fulfilment measure. This is in agreement with previous studies demonstrating that retirement planning is associated with financial confidence, with poor retirement planning being related to a lack of financial knowledge and financial preparation for retirement.[7] Thus, our findings support the intercorrelation between the 4 dimensions of retirement confidence. Further, we showed that the correlation between the overall RCI score and the self-reported measure of retirement confidence was as high as r = .753, reflecting 56.7% shared variance, which supports the construct

Table 4. Means and standard deviations of female and male pre-retirees and retirees on each of the 9 RCI components and the overall retirement confidence index score.

Retirement Confidence Index (RCI) Components	Pre-retiree				Retiree				
	Overall Mean (SD)	Male Mean (SD)	Female Mean (SD)	Female vs Male Pre-Retirees t (p)	Overall Mean (SD)	Male Mean (SD)	Female Mean (SD)	Female vs Male Retirees t (p)	Pre-Retirees vs Retirees t (p)
Overall score	62.58 (14.79)	64.52 (15.15)	61.18 (14.40)	2.81 (**.005**)	67.47 (13.79)	67.80 (13.36)	67.06 (14.34)	.65 (.51)	−6.04 (**<.001**)
Financial literacy	61.42 (27.18)	69.85 (26.05)	55.72 (26.24)	7.37 (**.001**)	65.15 (27.97)	70.72 (25.36)	58.62 (29.48)	5.98 (**<.001**)	−2.62 (**.008**)
Financial anxiety	66.63 (26.99)	69.19 (26.34)	64.75 (27.39)	2.23 (**.02**)	78.20 (22.99)	79.81 (21.74)	76.38 (24.33)	2.00 (**.04**)	−8.89 (**<.001**)
Financial control	66.68 (20.01)	66.44 (20.55)	66.76 (19.64)	−.21 (.82)	71.02 (17.72)	70.32 (17.07)	71.88 (18.48)	−1.17 (.23)	−4.42 (**<.001**)
Financial attitudes and behaviour	60.23 (19.03)	61.81 (19.16)	59.03 (18.83)	1.97 (**.04**)	64.81 (17.88)	66.05 (17.24)	63.32 (18.52)	2.03 (**.04**)	−4.74 (**<.001**)
Mental health	60.26 (21.74)	61.42 (21.81)	59.41 (21.73)	1.23 (.21)	62.87 (20.32)	62.02 (20.60)	63.96 (19.89)	−1.26 (.20)	−2.35 (**.01**)
Physical health	67.98 (18.00)	71.70 (16.77)	65.43 (18.41)	4.61 (**<.001**)	71.73 (15.20)	73.29 (13.97)	69.80 (16.27)	3.01 (**.002**)	−4.19 (**<.001**)
Social connectedness	70.75 (24.76)	70.48 (24.19)	70.90 (25.24)	−.23 (.81)	73.64 (23.67)	71.96 (23.27)	75.38 (24.03)	−1.93 (.05)	−2.29 (**.02**)
Goal setting	46.76 (25.97)	49.69 (26.23)	44.58 (25.56)	2.66 (**.007**)	56.92 (25.03)	58.64 (23.94)	55.14 (26.11)	1.87 (.06)	−7.63 (**<.001**)
Future uncertainties	53.56 (19.41)	55.28 (19.16)	52.35 (19.56)	2.06 (**.03**)	57.24 (18.78)	56.62(18.48)	57.89 (19.19)	−.90 (.36)	−3.71 (**<.001**)

Note: SD, Standard deviation. Significant P values (<.05) are bolded. All RCI scores were calculated such that a higher score is desirable.

Table 5. Bivariate relationships between RCI dimensions and self-reported measures of retirement confidence.

RCI dimensions	Self-report measures				
	Social	Financial	Health	Fulfilment	Retirement confidence
Social Factors	.555**	.281**	.429**	.451**	.502**
Financial Awareness and Skills	.506**	.603**	.454**	.554**	.626**
Health and Well-Being	.620**	.444**	.591**	.606**	.662**
Retirement Awareness and Planning	.544**	.622**	.501**	.569**	.661**
RCI overall score	.689**	.592**	.605**	.673**	.753**

Note: **P < .001.

validity of the RCI. Altogether, our findings demonstrate that the RCI provides a valid framework and assessment tool to measure retirement confidence.

The present research was subject to potential limitations. Validity of the RCI was demonstrated through associations with related self-report measures. Our validation study was cross-sectional and, therefore, provides initial understanding regarding associations between the RCI components and corresponding self-report measures. Future studies should use longitudinal designs to determine whether the RCI can detect changes in retirement confidence as people transition to retirement or encounter other major life events, such as a divorce or a financial crisis. On a related note, given the proposed predictive role of retirement confidence, future studies should examine whether the RCI is a valid predictor of key retirement outcomes, such as retirement adjustment and satisfaction.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

Ethics approval

This research was approved by the author's University Human Research Ethics Committee (CF16/2201-2016001096).

Data Transparency

All data related to this project can be provided upon request.

Consent to Participate

Participants consented to participate of this research by completing the study questionnaire; however, they could choose to withdraw from the study while they were completing the questionnaire.

Consent for Publication

All authors listed on this manuscript have consented to the publication of this article.

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