

Perceptions of Retirement Adequacy: Evidence From South Africa

Michelle Reyers^a

Concerns regarding the adequacy of retirement savings have contributed to the move to encourage better savings behavior. One area of research focuses on understanding the profile of individuals who believe they are preparing adequately for retirement. The current study uses data from a national survey of South Africans to determine how confident workers are about their future retirement income adequacy, and whether behavioral characteristics play a role in their perception of retirement readiness. This study highlights the role that behavioral factors play in perceptions of retirement income adequacy in an African developing market context. In particular, financial risk tolerance, future time perspective, good financial behavior, and self-assessed financial knowledge are all found to be positively related to respondents' retirement confidence.

Keywords: financial behavior, financial knowledge, retirement adequacy, retirement preparation

Worldwide, there is concern that individuals are not preparing adequately for retirement, and an aging population in many developed countries further exacerbates the problem. Whereas developing countries currently have less of a problem in terms of aging populations, it is estimated that by 2050, more than 80% of the worldwide population over the age of 60 years will reside in developing countries (United Nations, 2005). In Africa, the percentage of the population over the age of 60 years is expected to nearly double between now and 2050 (United Nations, 2015). This increase in the aging population is expected to escalate levels of old-age poverty unless measures are taken to improve income support for the elderly. It has been suggested that there is a window of opportunity to implement pension system reforms during the next few decades, while dependency ratios are falling, and before the impact of an aging population is felt (Abels & Guven, 2016; Stewart & Yermo, 2009). Therefore, it is important to investigate the current retirement landscape in African countries to better understand the potential impact of these changing demographic trends, and the implications for the design of effective pension reform.

Low savings rates in many countries, volatile financial markets, and the potential inability of government to provide

adequate social security to individuals beyond retirement, all contribute to the move to encourage better savings behavior and understand what drives such behavior. One area of research has focused on understanding the profile of individuals who believe they are preparing adequately for retirement and are thus confident about their retirement preparations to determine how that differs from those who are less confident. Whereas sociodemographic factors have been linked to retirement adequacy, there is an acknowledgement that financial knowledge and individual psychological characteristics related to behaviors and attitudes are also important.

Studies which have considered the association between these behavioral characteristics and perceived retirement adequacy have found that individuals with positive financial attitudes and behaviors are more likely to consider themselves to be adequately preparing for retirement (Joo & Pauwels, 2002). Furthermore, when considering willpower as it relates to future time perspective, those who are considered to be longer-term planners were also more confident about their retirement preparations (Malroux & Xiao, 1995). However, a study that compared American and Dutch respondents only found positive effects for Americans with respect to future time perspective, whereas for the

^aSenior Lecturer, Department of Financial Management, University of Pretoria, Private Bag X20, Hatfield, Pretoria, South Africa, 0028. E-mail: dr.michelle.reyers@gmail.com

Dutch respondents, this was not a statistically significant predictor of perceived retirement savings adequacy (Van Dalen, Henkens, & Hershey, 2010). Lastly, those with higher levels of financial risk tolerance also had higher levels of retirement confidence (Joo & Pauwels, 2002).

With respect to financial knowledge, studies have found that those who receive financial education and advice in the workplace are also more likely to be confident about their retirement preparations (Joo & Pauwels, 2002; Kim, Kwon, & Anderson, 2005). In addition, those who subjectively assess themselves as being financially knowledgeable are more likely to perceive themselves as preparing adequately for retirement (Segel-Karpas & Werner, 2014; Van Dalen et al., 2010). Although the above-mentioned studies have provided insights into the relationship between behavioral characteristics and retirement confidence, it is not clear whether these relationships also exist in an African developing market context.

Limited research regarding retirement adequacy exists in South Africa. In light of the current structure of the South African retirement system, where there is no public or national retirement scheme, it is important to obtain a clearer understanding of how confident individuals are about their retirement preparations and what factors are associated with whether individuals perceive themselves to be adequately preparing for retirement, as this may differ from countries where public pension plans are in place to provide an additional safety net during retirement.

Therefore, the objectives of this study were first to assess South African employed workers' perceptions of their retirement preparedness, and second, to explore what factors predict whether these individuals perceive themselves to be preparing adequately for retirement, with a particular focus on behavioral characteristics.

Retirement in South Africa

In line with trends in the rest of Africa, over the next few decades, South Africa is also expected to see rapid growth in the segment of the population who are over the age of 60 years (United Nations, 2015). Over the past decade, the South African government has been focused on retirement reform with a view to providing more comprehensive support for the elderly. One particular focus is to develop a mandatory national pension scheme. Currently, a key gap in

the South African retirement system is that, unlike in many other countries, there is no public or national retirement scheme. Instead, there is a state-sponsored noncontributory old-age grant, which is means tested. There is, however, a pension fund for government employees and an established private pension system (South Africa, National Treasury, 2004, 2007).

Therefore, in terms of the multi-pillar approach defined by the World Bank as the basis for a comprehensive retirement framework, South Africa has pillar 0 (the noncontributory old age grant for poverty alleviation), but there is no pillar 1 (mandated contributory public pension plan). In terms of pillar 2 (mandated occupational or personal pension plans) and pillar 3 (voluntary occupational or personal retirement savings), the South African occupational pension system is considered to be quasi-mandatory. Employers are not obligated to provide a retirement fund to employees; however, if a fund exists at a specific employer, it is usually compulsory for employees to become members of that fund. Despite the fact that provision is not mandatory, coverage rates are generally high in the formal sector, which employs half of the South African labor force, and it is estimated that 60% of individuals working in the formal sector are members of a retirement fund provided by their employer (Holzmann, Hinz, & Gersdorff, 2005; Statistics South Africa, 2016; Van der Merwe, 2004).

From the perspective of personal retirement savings, approximately 20% of the total labor force are members of private retirement savings funds; however, some of these individuals are also members of occupational funds. After accounting for those who may belong to more than one fund, it is estimated that between 66% and 84% of employees in the formal sector are covered by employer-sponsored and/or private retirement funds (South Africa, National Treasury, 2004, 2013).

Despite high levels of retirement fund participation for those who are employed in the formal sector, approximately 20% of the labor force work outside of the formal sector, and 30% are unemployed; therefore, half of the labor force do not generally have access to retirement funds. Against this backdrop, it is estimated that potentially two-thirds of all South Africans may not have a funded pension benefit at retirement and will need to rely on social grants after retirement. There are also concerns that, due to inadequate

savings, many of those with pensions may have to live off much lower levels of income in retirement (South Africa, National Treasury, 2007; Statistics South Africa, 2016). South Africa, therefore, presents a unique opportunity to explore retirement confidence in a country with an established private pension system but without the safety net provided by a mandatory public pension plan.

Literature Review and Research Questions

Retirement Adequacy

In many countries, there are concerns regarding low levels of retirement savings leading to inadequate income in retirement. From a South African perspective, given the high levels of unemployment, many are unable to save for retirement, and these individuals will generally be reliant on old-age grants once they reach the age of 60 years. For the 70% of the labor force that is employed, there is, however, a well-established occupational and individual retirement fund industry that provides coverage rates of between 66% and 84% for those employed in the formal sector, which translates to between 46% and 59% coverage for the total employed population (South Africa, National Treasury, 2004; Statistics South Africa, 2016). In line with the trend in the rest of the world, there has been a move to defined contribution schemes in South Africa, and the majority of funds offered in the private sector are defined contribution funds, whereas those in the public sector still tend to be defined benefit funds (Stewart & Yermo, 2009).

Despite the high levels of retirement fund coverage for those who are employed in the formal sector, it is projected that over half of pensioners who reach retirement with a funded pension receive a retirement income that equates to less than 28% of preretirement income levels, mainly as a result of employees cashing out their retirement funds when they change jobs (South Africa, National Treasury, 2004, 2007). This is concerning in light of the fact that it has been suggested that, in a South African context, even a replacement rate of 75% may be inadequate to ensure a comfortable retirement as studies have found that in many instances, South African households' postretirement consumption levels do not decrease compared to preretirement levels. In addition, certain households face higher medical costs, therefore increasing postretirement consumption levels even further. Many individuals may, therefore, have to delay retirement to ensure they have adequate retirement savings (Butler & Van Zyl, 2012a, 2012b).

As the old age grant currently only provides income of South African Rand 1,510 a month (approximately US \$100) and is means tested, it is generally not seen as a substitute for retirement funding for those in middle to higher socioeconomic groups who have not saved sufficiently for retirement. However, it is considered to be a substantial sum of money for those in lower socioeconomic groups who have not accumulated retirement savings (Ambler, 2016; Department of Social Development, 2016).

There has been limited research regarding retirement savings in South Africa, and research that has been carried out generally focused on the state-sponsored old age grant (Ambler, 2016). As the old age grant is noncontributory, and more of a redistributive element of the system in South Africa, this research has not provided insights into the behavior and perceptions of workers who contribute to occupational and voluntary retirement savings products. The focus of this study is, therefore, on the employed population in South Africa, as those who are unemployed are expected to rely on the old-age grant as their primary source of income in retirement.

Perceptions of Retirement Adequacy. Understanding whether individuals perceive themselves to be properly preparing for retirement is a crucial piece of the retirement adequacy puzzle, as in many instances, perceptions drive actions. The basis for this approach is the theory of symbolic interaction, in terms of which behaviors are said to be based on what individuals believe, and not necessarily on what is objectively true (Andersen, Taylor, & Logio, 2015). Prior research on worker attitudes to retirement has found support for this theory, in that workers with a more positive attitude to retirement were more likely to engage in retirement planning and were more likely to use professional financial advice (Joo & Grable, 2001; Mutran, Reitzes, & Fernandez, 1997). It is, therefore, important to examine subjective factors in retirement planning as these are linked to individual's perceptions that in turn may influence savings behavior (Kemp, Rosenthal, & Denton, 2005).

The focus on perceptions of retirement adequacy has certain limitations as an individual's perceptions might not be in line with reality. However, studies have found that individuals generally seem to have a good understanding of what constitutes an adequate income in retirement (Binswanger & Schunk, 2012). In addition, individuals appear to be

aware of whether they are at risk of not being able to meet their retirement goals. Studies have found that the majority of individuals' self-assessments mirrored the objective reality of their retirement preparedness. However, one-third of individuals believed they were adequately preparing for retirement when from an objective standpoint they were not, which indicates that there are gaps between perception and reality that could lead to individuals not taking the required actions to prepare adequately for retirement (Kim & Hanna, 2015; Munnell, Golub-Sass, Soto, & Webb, 2008).

Despite the potential limitations of this measure, there is growing recognition that studies that consider subjective assessments of retirement readiness are as important as studies of actual savings because perceptions have the ability to drive decisions and behavior (Joo & Pauwels, 2002; Segel-Karpas & Werner, 2014; Van Dalen et al., 2010). For this reason, a clearer understanding of the factors linked to perceived financial preparedness for retirement is beneficial, as it may aid in understanding the individual as a financial decision maker.

Factors Related to Perceptions of Retirement Adequacy

Given the wide variety of pension systems in place around the world, perceptions of retirement adequacy, or retirement confidence, would be expected to vary by country depending on the coverage provided in terms of the specific retirement system. Therefore, individuals from countries with more comprehensive pension systems would generally be expected to display higher levels of retirement confidence, compared to those from countries with less robust systems. A study, which considered whether workers across Europe were worried that their income in retirement would be inadequate, reported low levels of worry in countries with highly developed pension systems such as in Scandinavia and the Netherlands, compared to high levels of worry in Eastern European countries where pension systems are less developed (Hershey, Henkens, & van Dalen, 2010).

Much of the research relating to retirement confidence has been carried out in the United States. The 2016 Retirement Confidence Survey, which surveys a nationally representative sample of U.S. workers, found that 63% of workers report that they are either very or somewhat confident that they would have enough money to live comfortably during their retirement (Helman, Copeland, & VanDerhei, 2016). Other studies of retirement confidence have made use of perceived

retirement adequacy scores and have found moderately high levels of retirement confidence among Dutch and U.S. workers, with lower levels of confidence observed in samples of Israeli and Hong Kong workers (Chou et al., 2015; Segel-Karpas & Werner, 2014; Van Dalen et al., 2010).

In addition to country-specific differences in pension systems, a number of variables related to the individual decision maker are expected to be associated with retirement confidence. They can broadly be categorized as sociodemographic factors and factors related to behavioral characteristics.

Sociodemographic Variables Related to Perceived Retirement Adequacy

Generally, it is expected that those who have a higher earning capacity, fewer expenses related to ill health and fewer dependents, may be in a better position to prepare adequately for retirement. In addition, if different ethnic groups are impacted by racial inequality in education and job opportunities, race would also be expected to play a role in retirement confidence. Gender is likewise thought to be significant as education, and employment inequalities could result in females being less confident about retirement than males (Joo & Pauwels, 2002). Research into perceived retirement adequacy has, however, not found unanimous support for these expected relationships (Joo & Pauwels, 2002; Kim et al., 2005; Malroux & Xiao, 1995; Segel-Karpas & Werner, 2014).

Behavioral Characteristics Associated With Perceived Retirement Adequacy

The impact of behavioral or psychological influences on savings decisions generally stems from either cognitive and computational limitations or are linked to individual psychological characteristics such as willpower and risk tolerance (Benartzi & Thaler, 2007; Howlett, Kees, & Kemp, 2008; Jacobs-Lawson & Hershey, 2005). Individual psychological characteristics manifest themselves in financial behaviors and attitudes to money and so also play an important role in individual financial decision making (Joo & Grable, 2000; Hayhoe et al., 2012). This has also been confirmed in samples of low to moderate income households (Hogarth & Angelov, 2003; Mauldin, Henager, Bowen, & Cheang, 2016).

Research regarding these behavioral characteristics generally focuses on the role of financial knowledge in overcoming computational limitations and understanding how

individual psychological characteristics relate to financial decision making (Bi, Finke, & Huston, 2017; Howlett, Kees, & Kemp, 2008; Jacobs-Lawson & Hershey, 2005). Generally, these studies have confirmed that behavioral characteristics are important determinants in savings decisions and financial planning. Therefore, these factors might also be linked to whether individuals perceive themselves to be adequately preparing for retirement, as their perception has the potential to impact on retirement preparation and confidence. While studies of perceived retirement adequacy have found support for the role played by both financial knowledge and individual psychological characteristics related to behaviors and attitudes (Joo & Pauwels, 2002; Kim et al., 2005; Malroux & Xiao, 1995; Segel-Karpas & Werner, 2014; Van Dalen et al., 2010), further research is required to determine whether these characteristics are also relevant in an African developing market context and specifically in a country where no national or public retirement scheme exists to provide individuals with an additional level of support in retirement.

Therefore, based on the theoretical foundation provided by the literature above, two research questions were proposed: (a) Do employed workers in South Africa perceive themselves to be preparing adequately for retirement? and (b) What factors predict whether individuals perceive themselves to be adequately preparing for retirement?

Method

Data and Sample

The study uses data from the South African Social Attitudes Survey (Human Sciences Research Council, 2011). The survey used questions developed by the International Network of Financial Education (INFE) to collect information about financial decision making and behavioral characteristics (OECD, 2011). A nationally representative sample of South Africans over the age of 16 years took part in the survey. As this study focused on preretiree's perceptions of retirement income adequacy, those who indicated that they were already retired were removed from the sample. In addition and in line with previous studies (Joo & Pauwels, 2002; Malroux & Xiao, 1995; Van Dalen et al., 2010), the sample was limited to working respondents (full time, part time, and self-employed workers). Respondents with data missing from any of the study variables were removed, resulting in a final sample of 696 respondents.

Measures

Outcome Variable. The outcome variable was based on the answer to the following question: "Taking all of the various sources of retirement income into account, how confident are you that your income will give you the standard of living you hope for throughout retirement?" Those who were confident they would have adequate income were coded 1, and those who were not confident were coded 0.

Behavioral Predictors. The study included variables that covered the two key components that have been identified as important considerations in financial decision making: financial knowledge and individual psychological characteristics.

Financial knowledge. This was measured using the "knowledge and understanding" domain of questions developed by the INFE (OECD, 2011). The percentage correct score of the eight questions was treated as a continuous variable in the model. These questions have been used in previous studies and are considered to be valid and reliable measures of financial knowledge (Atkinson & Messy, 2011). In addition, respondents provided a subjective assessment of financial knowledge by rating their level of financial knowledge on a 5-point scale. The reason for including both objective and subjective measures of financial knowledge is that there is an increasing recognition that both are important, yet distinct factors, in understanding the financial decision making of individuals (Babiarz & Robb, 2014).

Individual Psychological Characteristics. The following aspects were considered: financial behavior and financial attitude; money attitudes (which include measures of, among other aspects, future time perspective); and financial risk tolerance.

Financial Behaviors and Financial Attitudes. Variables were developed using seven attitude and behavior statements and a 5-point response scale. The statements were also developed by the INFE (OECD, 2011). In order to reduce these questions into specific components, principal component analysis was carried out. Two factors were identified, four questions related to financial behaviors loaded on factor 1, and the remaining three, which focussed on financial attitudes, loaded on factor 2. The factor scores were included as independent variables in the analysis. The vari-

TABLE 1. Rotated Component Matrix Financial Behavior and Financial Attitude

Item	Component	
	1 (Good Financial Behavior)	2 (Bad Financial Attitude)
I keep a close personal watch on my financial affairs	.839	-.059
I set long term financial goals and work hard to achieve them	.743	-.045
I pay my bills on time	.736	-.026
Before I buy something I carefully consider whether I can afford it	.524	-.071
I tend to live for today and let tomorrow take care of itself	-.043	.778
Money is there to be spent	-.006	.741
I find it more satisfying to spend money than to save it for the long term	-.125	.739
% of variance explained	31.85	22.44
Cumulative % of variance explained	31.85	54.29

Note. Factor loadings above .5 appear in boldface.

ables were coded so that high factor scores on the financial behavior component indicated good financial behavior, whereas high factor scores on the financial attitude component indicated bad financial attitudes. The results of the principal component analysis are presented in Table 1.

Money Attitudes. The questionnaire contained statements taken from the Money Attitude Scale (MAS) developed by Yamauchi and Templer (1982) as modified by Roberts and Sepulveda (1999). These statements were part of the supplementary questions suggested by the INFE (OECD, 2012). Only 10 of the 28 original statements were included in the survey, and these statements were expected to capture the following dimensions: power–prestige, retention time, distrust–consumer competency, anxiety, and bargain-conscious/compulsive.

Principal component analysis was conducted, and all questions loaded on the five factors in line with the MAS as adapted by Roberts and Sepulveda (1999). Factor scores were included as independent variables in the analysis. The coding of responses resulted in high scores, indicating that an individual displayed the characteristics of the specific component of the MAS. The results of the analysis are presented in Table 2.

Financial Risk Tolerance. The measure for financial risk tolerance was based on a 5-point scale response to the question “When thinking about making a financial investment, how willing are you to take risks?” Answers ranged from not at all willing to very willing.

Sociodemographic Predictors. Age, gender, marital status, child dependents, race, household income, level of education, health status, and employment status were included as independent variables in the model.

Analysis

As the outcome variable was dichotomous, binary logistic regression was used to determine what variables were significant predictors of perceived adequacy of retirement income, as part of a multivariate model. IBM SPSS Statistics Version 23 was used for data analysis, and two multivariate models were constructed. Model 1 contained only sociodemographic variables as predictors. Model 2 included behavioral factors in addition to the sociodemographic variables. The purpose of Model 1 was to create a baseline, so that it was possible to ascertain whether the inclusion of behavioral predictors (in Model 2) improved the model fit and predictive ability.

Results

Descriptive Statistics and Bivariate Analysis

Table 3 provides an overview of the characteristics of the sample. In addition, the results of a bivariate analysis of each variable as a standalone predictor of retirement confidence are also included in Table 3. The bivariate analysis made use of the Wald test statistic to determine statistical significance.

In this sample, 65.8% of respondents were confident that their retirement income would give them the standard of living they hoped for throughout retirement. The bivariate analysis indicated that when each predictor was considered in isolation and no controls were added, those who were married, White, earning high incomes, in full-time employment, educated, or healthy were more likely to be confident about the adequacy of

TABLE 2. Rotated Component Matrix Money Attitude Scale

Item	Component				
	Retention Time	Bargain-Conscious/ Compulsive	Anxiety	Power–Prestige	Distrust
I do financial planning for the future	.939	.081	.039	.072	.088
I put money aside on a regular basis for the future	.937	.017	.031	.132	.076
It's hard for me to pass up a bargain	.086	.894	.165	.144	.178
I am bothered when I have to pass up a sale	.021	.891	.211	.183	.108
I show signs of nervousness when I don't have enough money	.004	.214	.895	.112	.114
I show worrisome behavior when it comes to money	.088	.194	.767	.068	.403
I purchase things because I know they will impress others	.040	.163	.072	.886	.050
People I know tell me that I place too much emphasis on money as sign of success	.176	.134	.105	.844	.148
I argue or complain about the cost of things I buy	.135	.212	.117	.071	.865
I hesitate to spend money, even on necessities	.039	.062	.413	.163	.699
% of variance explained	37.51	17.10	12.64	9.88	6.72
Cumulative % of variance explained	37.51	54.61	67.25	77.13	83.85

Note. Factor loadings above .5 appear in boldface.

their retirement income. In addition, those with higher levels of self-assessed financial knowledge, higher levels of financial risk tolerance, good financial behavior, or who had a high retention-time measure on the MAS (indicating a future time perspective) were more likely to be confident about their retirement income adequacy.

Multivariate Analysis Results

Table 4 presents the results of the multivariate analysis using the two models. The multivariate analysis used the Wald test statistic to assess statistical significance of each predictor. The results are interpreted by considering the impact of each variable while holding all other variables constant. For categorical variables, the results are interpreted with respect to the reference category. Tests confirmed that multicollinearity was not a concern as no tolerance values were below 0.2, and Variance Inflation Factor (VIF) values ranged from 1.04 to 2.27, with the average VIF being 1.3.

A comparison of model fit and predictive ability between the model that included behavioral variables (Model 2) and the model with only sociodemographic variables (Model 1)

indicate that Model 2 is superior. From a model fit perspective, the Cox and Snell R^2 and Nagelkerke R^2 , where both higher for Model 2 than for Model 1, indicating that Model 2 has a stronger relationship between the predictors and outcome variable. In terms of predictive ability, for Model 1, the area under the receiver operating characteristic (ROC) curve was .789 (standard error [SE] = .018), which provides an acceptable discrimination between groups. Whereas, for Model 2 the area under the ROC curve was .838 (SE = .016), which provides an excellent discrimination between groups (Hosmer & Lemeshow, 2000).

In Model 1, the statistically significant predictors of perceived adequacy of retirement income in a multivariate context were respondents who had a high income and more years of education. In addition, Black respondents were more likely to report confidence in retirement income adequacy than White respondents.

Once behavioral variables were added in Model 2, the statistically significant predictors from Model 1 remained significant. In addition, those with higher levels of financial

TABLE 3. Descriptive Statistics and Bivariate Analysis of Relationship Between the Study Variables and Retirement Confidence (n = 696)

Characteristic	Frequency (%)	Mean (SD)	Bivariate Analysis Beta (SE)
Retirement confidence			
Confident	65.8		
Not confident	34.2		
Sociodemographic variables			
Age (years)		39.05 (10.86)	0.009 (0.007)
Gender			
Female	42.8		-0.107 (0.161)
Male ^a	57.2		N/A
Marital status			
Not married	52.0		-0.523 (0.162)**
Married ^a	48.0		N/A
Number of dependents		1.01 (1.24)	-0.090 (0.063)
Race of respondent			
Black/African	58.5		-0.656 (0.264)*
Mixed ethnic origin	12.2		-1.109 (0.326)**
Indian or Asian	15.4		-0.237 (0.326)
White ^a	13.9		N/A
Household monthly salary			
Less than ZAR2,000	17.5		-2.547 (0.326)***
ZAR2,001–ZAR5,000	22.3		-1.753 (0.307)***
ZAR5,001–ZAR10,000	23.7		-0.811 (0.315)*
ZAR10,001–ZAR20,000	19.4		0.146 (0.369)
More than ZAR20,000 ^a	17.1		N/A
Employment status			
Self employed	31.3		-0.058 (0.180)
Employed part time	12.9		-0.521 (0.238)*
Employed full time ^a	55.7		N/A
Education (years) ^b		11.55 (2.92)	0.314 (0.036)***
Health (rating on scale of 1–11)		7.45 (1.96)	0.091 (0.040)*
Financial knowledge			
Financial knowledge test score (%)		69.50 (20.19)	0.007 (0.004)
Self-reported financial knowledge (scale of 1–5)		3.49 (1.13)	0.752 (0.082)***
Individual psychological characteristics			
Good financial behavior (average rating on scale of 1–5)		4.05 (0.76)	0.629 (0.089)***
Bad financial attitude (average rating on scale of 1–5)		2.67 (0.88)	-0.056 (0.082)
MAS: time (average rating on scale of 1–7)		4.51 (1.95)	0.940 (0.094)***
MAS: bargain (average rating on scale of 1–7)		3.40 (1.80)	-0.021 (0.081)
MAS: anxiety (average rating on scale of 1–7)		4.27 (1.75)	-0.140 (0.081)
MAS: power (average rating on scale of 1–7)		2.73 (1.66)	0.161 (0.082)
MAS: distrust (average rating on scale of 1–7)		4.05 (1.58)	-0.065 (0.081)
Financial risk tolerance (rating on scale of 1–5)		3.18 (1.3)	0.504 (0.066)***

Note. US \$1 = approximately ZAR7.00 at time of survey data collection in 2011. MAS = Money Attitude Scale; N/A = not applicable; SE = standard error; ZAR = South African Rand. Wald test statistic: * $p < .05$. ** $p < .01$. *** $p < .001$.

^aReference category.

^bEducation level was converted to number of years to avoid possible collinearity with income categories.

TABLE 4. Logistic Regression Analysis of Perceived Adequacy of Retirement Income (n = 696)

Predictor Variable	Model 1		Model 2	
	Beta	SE	Beta	SE
Sociodemographic predictors				
Age	0.009	0.009	0.010	0.010
Female (vs male)	-0.169	0.193	-0.127	0.210
Unmarried (vs married)	-0.137	0.205	-0.019	0.227
Number of dependents	-0.103	0.075	-0.031	0.082
Race of respondent (vs White)				
Black/African	1.124**	0.353	0.836*	0.397
Mixed ethnic origin	0.258	0.395	0.176	0.429
Indian or Asian	0.361	0.366	0.259	0.403
Household monthly salary (vs more than ZAR20,000)				
Less than ZAR2,000	-2.357***	0.432	-1.634**	0.477
ZAR2,001–ZAR5,000	-1.811***	0.389	-1.177**	0.425
ZAR5,001–ZAR10,000	-0.886*	0.362	-0.422	0.389
ZAR10,001–ZAR20,000	0.026	0.386	0.286	0.408
Employment status (vs. employed full time)				
Self-employed	-0.076	0.213	-0.088	0.234
Employed part time	-0.082	0.283	-0.141	0.312
Education	0.180***	0.043	0.125**	0.047
Health	-0.021	0.049	-0.044	0.054
Financial knowledge				
Financial knowledge test score			-0.007	0.005
Self-reported financial knowledge			0.333**	0.102
Individual psychological characteristics				
Good financial behavior			0.330**	0.114
Bad financial attitude			0.043	0.110
MAS:time			0.442***	0.118
MAS: bargain			-0.059	0.107
MAS: anxiety			-0.028	0.104
MAS: power			0.055	0.107
MAS: distrust			-0.055	0.105
Financial risk tolerance			0.246**	0.085
Constant	-0.880	0.950	-1.937	1.084

Note. Reference category in parentheses. Model 1: $R^2 = .219$ (Cox and Snell); .303 (Nagelkerke). Model $\chi^2(15) = 172.046$, $p < .001$. Model 2: $R^2 = .306$ (Cox and Snell); .423 (Nagelkerke). Model $\chi^2(25) = 253.435$, $p < .001$. MAS = Money Attitude Scale; SE = standard error; ZAR = South African Rand. Wald test statistic: * $p < .05$. ** $p < .01$. *** $p < .001$.

risk tolerance, those who scored highly in terms of good financial behavior, and those with a future time perspective (as measured by the time-retention construct of the MAS) were more likely to report that they were confident about their retirement income adequacy. In addition, those with a high self-reported level of financial knowledge were also

more likely to be confident about their retirement income adequacy.

When comparing the above results with the original bivariate analysis, a number of variables were no longer significant in a multivariate context; these include marital status,

employment status, and health. One variable that remained significant, but reversed in terms of the direction of the relationship, was race. In the bivariate analysis, Black respondents were less confident than White respondents in terms of their perceived adequacy of retirement income; however, when all other demographic and behavioral variables were controlled for, Black respondents were more confident regarding the adequacy of retirement income than their White counterparts.

Discussion

With respect to the first objective of this study, South African workers appear to have fairly high levels of confidence with 65.8% reporting that they are confident they will have an adequate retirement income. The high reported levels of confidence do not appear to match reports in South Africa that caution that the majority of workers are inadequately prepared for retirement (South Africa, National Treasury, 2007). A potential explanation is that those without adequate funds may believe that the old-age grant, or assistance from family, will be sufficient to maintain their living standards after retirement. Alternatively, given the high coverage of workers in the formal sector by occupational funds, this level of confidence may reflect that individuals believe that if they are contributing to a retirement fund, they will have a comfortable retirement, without realizing that their accumulated funds may be insufficient.

If levels of confidence are not based on reality, then more needs to be done to educate and inform workers regarding what savings they need to accumulate for retirement and the detrimental consequences of accessing funds prior to retirement. In this regard, as part of the retirement reform process in South Africa, draft regulations, which propose retirement benefits counselling to assist employees to make better decisions regarding their retirement savings, may be beneficial for individuals with unrealistic expectations regarding their retirement prospects (South Africa, National Treasury, 2016).

From a comparative perspective, this level of confidence is in line with that reported by U.S. workers (Helman et al., 2016) despite the fact that in South Africa, there is no national pension system. This may provide an indication that workers in South Africa are not necessarily concerned about the lack of a safety net or alternatively that they consider the government old age grant as an alternative source

of funding. However, this would only be applicable to those in the lower socioeconomic brackets. In addition, the high level of confidence may be reflective of the expectation of postretirement support from family as a result of the collective culture in South Africa, which differs from the individualistic culture of the United States (Ferreira, 2000).

Despite these alternative explanations, the results may indicate that workers are overly optimistic about their retirement prospects. It is not clear whether the impact of this would be positive or negative. Overoptimism may encourage individuals to take actions, which align with this confidence, by making decisions to save in the future. Alternatively overoptimism might lead to inaction, as individuals believe they have already made adequate provision for retirement. Further research is required to establish the gap between perception and reality in South Africa and the potential implications of overconfidence on retirement savings decisions.

The second research objective considered which factors were predictors of perceived retirement income adequacy, and focused on determining the role played by behavioral characteristics. Considering sociodemographic variables, the key predictors were in line with previous studies in terms of income and education level, where those with higher income and more years of education were more likely to report having confidence in their retirement income adequacy (Joo & Pauwels, 2002; Kim et al., 2005). It is generally accepted that those with more disposable income have more opportunities to save for retirement. Additionally, in a South African context, those with higher income and education levels are also more likely to be in formal employment and, therefore, probably members of occupational retirement schemes, which could also explain higher levels of retirement confidence.

When considering race, this study had similar findings to previous studies in that in a multivariate context and when controlling for a variety of socioeconomic, demographic, and behavioral variables, Black respondents were more confident than White respondents regarding the adequacy of their retirement savings (Kim, Kwon, & Anderson, 2005; Malroux & Xiao, 1995). Although the finding in the bivariate analysis reflected the opposite of this, given the socioeconomic context of South Africa, where poverty is highly concentrated among the Black population group due to past

racial inequalities, it is important to control for factors such as income and education prior to drawing conclusions regarding race (Gradín, 2013). The multivariate analysis, therefore, provides a more accurate assessment of the association between race and retirement confidence as other sociodemographic variables are controlled for in this analysis. In the multivariate analysis, the confidence expressed by Black respondents compared to White respondents may relate to cultural differences. Studies in South Africa have found that Black respondents display more of the traits and characteristics of collectivism compared to the individualistic traits displayed by their White counterparts (Valchev, van de Vijver, Nel, Rothmann, & Meiring, 2013). Therefore, the expectation of family support postretirement might increase retirement confidence among these respondents. In addition, as the old age grant is means tested, and given the concentration of poverty in the Black population in South Africa, the recipients of grants are predominantly from the Black population (Ambler, 2016). The expectation of receiving this grant may, therefore, increase retirement confidence levels among Black respondents as, for those who qualify, the grant represents a substantial amount of money.

From a model comparison perspective, the inclusion of behavioral variables enhanced the model and improved both model fit and predictive ability. With respect to the specific behavioral variables, in line with previous studies, those with higher levels of financial risk tolerance were more likely to be confident about retirement (Joo & Pauwels, 2002). From the perspective of financial behaviors and attitudes, it was found that good financial behaviors predicted retirement confidence, and this confirmed the findings of Joo and Pauwels (2002); financial attitude was, however, not a statistically significant predictor. This study also confirmed that time perspective is an important predictor of retirement confidence as those who scored higher on the retention-time component of the MAS (which relates to a future time perspective) were more likely to be confident about their retirement income adequacy. This supports the results of prior studies (Malroux & Xiao, 1995; Van Dalen et al., 2010). These findings confirm that behavioral factors are also relevant in a South African retirement confidence context.

With regards to financial knowledge, when objective financial knowledge was used as a predictor in the multivariate model, it was not found to be a statistically significant predictor of retirement confidence. Conversely, subjectively

assessed financial knowledge was found to be a predictor of retirement confidence supporting what has been found in prior research (Segel-Karpas & Werner, 2014; Van Dalen et al., 2010). This finding highlights the importance of distinguishing between subjective and objective financial knowledge and understanding the potential links between subjective knowledge and behavior. Establishing how effective subjective financial knowledge is, as a predictor of positive financial behaviors, has been the focus of a number of studies. Findings indicate that subjective financial knowledge can be as important, if not more important, than objective financial knowledge in relation to financial behavior (Allgood & Walstad, 2016; Hadar, Sood, & Fox, 2013; Henager & Cude, 2016; Robb & Woodyard, 2011; Xiao, Tang, Serido, & Shim, 2011). In addition, there is a significant association between subjective financial knowledge and self-esteem, which in turn is related to financial behavior (Tang & Baker, 2016). This may in part explain the mechanism through which subjective financial knowledge is associated with retirement confidence; however, further research is required to better understand these relationships in this specific context.

The findings with regard to model fit and prediction, along with the statistical significance of a number of behavioral predictors, confirm that behavioral variables provide additional insight into the profile of workers who are more confident about their retirement income adequacy. This supports the growing body of research that confirms the importance of behavioral considerations in consumer finance research and confirms the significance of these characteristics in a developing market economy in Africa.

This study has limitations that need to be taken into consideration. First, the study makes use of an individual's perception of their retirement income adequacy and, as noted in the literature review, perceptions do not necessarily reflect reality. Nevertheless, there is research that supports that individuals have a fairly good understanding of their preparedness for retirement. Second, the study does not establish causation, and endogeneity might be an issue with some variables, as the direction of the relationship may not flow from the predictor to the outcome but rather in the reverse.

Conclusions and Implications

This study is the first to consider retirement confidence in a broad sample of employed individuals in South Africa. The

study adds to the existing literature regarding perceptions of retirement income adequacy and provides new insights from the perspective of an African developing market economy. In addition, the study considers a broad range of behavioral factors as predictors of retirement confidence and confirms the importance of behavioral characteristics in the context of individual perceptions of retirement income adequacy. Participants who reported good financial behaviors and a future time perspective were more likely to be confident of the adequacy of their retirement income, which may provide useful insights for policymakers. The finding that subjective rather than objectively measured financial knowledge is a significant predictor of perceived retirement income adequacy highlights the potential importance of subjectively measured constructs and requires further investigation.

Findings indicate that retirement confidence levels among South African workers are high, which do not correspond with the general view that South African workers are inadequately prepared for retirement. Despite the absence of the additional safety net provided by a mandatory public pension, retirement confidence levels among South African workers are in line with that of U.S. workers. Although there are potential explanations for this, it would appear that overconfidence may be an issue with respect to perceptions of retirement income adequacy in South Africa. Therefore, further research needs to be carried out to ascertain whether perceptions mirror reality in terms of retirement income adequacy. If individuals are overly optimistic about their ability to retire comfortably, there is a risk that they may not take the necessary action to save adequately for retirement.

As general industry concerns regarding low levels of retirement savings do not appear to be mirrored by individual perceptions, financial planners and counsellors may need to do more to ensure that individuals have a proper understanding of whether or not they are adequately preparing for retirement. The current draft regulations in South Africa that require retirement benefits counselling may be one way of providing relevant information to individuals which could assist in narrowing the potential gap between perception and reality with respect to the adequacy of retirement savings.

From the perspective of financial educators, this study has confirmed the importance of subjective perceptions of financial knowledge and highlighted the need to distinguish

between subjective and objective financial knowledge. Therefore, as much as educators need to ensure that individuals improve their levels of objectively measured financial knowledge, building individual confidence and self-esteem related to financial knowledge also needs to be considered as part of a holistic approach to improve consumer financial decision making.

References

- Abels, M., & Guven, M. U. (2016). *Pension systems in sub-Saharan Africa: Brief review of design parameters and key performance indicators*. Washington, DC: World Bank.
- Allgood, S., & Walstad, W. B. (2016). The effects of perceived and actual financial literacy on financial behaviors. *Economic Inquiry*, 54(1), 675–697. <http://dx.doi.org/10.1111/ecin.12255>
- Ambler, K. (2016). Bargaining with grandma. *The Journal of Human Resources*, 51(4), 900–932.
- Andersen, M. L., Taylor, H. F., & Logio, K. A. (2015). *Sociology: The essentials* (8th ed.). Stamford, CT: Cengage Learning.
- Atkinson, A., & Messy, F. -A. (2011). Assessing financial literacy in 12 countries: An OECD/INFE international pilot exercise. *Journal of Pension Economics and Finance*, 10(04), 657–665. <http://dx.doi.org/10.1017/S1474747211000539>
- Babiarz, P., & Robb, C. A. (2014). Financial literacy and emergency saving. *Journal of Family and Economic Issues*, 35(1), 40–50. <http://dx.doi.org/10.1007/s10834-013-9369-9>
- Benartzi, S., & Thaler, R. H. (2007). Heuristics and biases in retirement savings behavior. *Journal of Economic Perspectives*, 21(3), 81–104. <http://dx.doi.org/10.1257/jep.21.3.81>
- Bi, Q., Finke, M., & Huston, S. (2017). Financial software use and retirement savings. *Journal of Financial Counseling and Planning*, 28(1), 107–128. <http://dx.doi.org/10.1891/1052-3073.28.1.107>
- Binswanger, J., & Schunk, D. (2012). What is an adequate standard of living during retirement? *Journal of Pension Economics and Finance*, 11(02), 203–222. <http://dx.doi.org/10.1017/S1474747211000618>
- Butler, M. B. J., & Van Zyl, C. J. (2012a). Consumption changes on retirement for South African households. *South African Actuarial Journal*, 12(1), 1–29. <http://dx.doi.org/10.4314/saaj.v12i1.1>

- Butler, M. B. J., & Van Zyl, C. J. (2012b). Retirement adequacy goals for South African households. *South African Actuarial Journal*, 12(1), 31–64. <http://dx.doi.org/10.4314/saaj.v12i1.2>
- Chou, K. L., Yu, K. M., Chan, W. S., Wu, A. M., Zhu, A. Y. F., & Lou, V. W. Q. (2015). Perceived retirement savings adequacy in Hong Kong: an interdisciplinary financial planning model. *Ageing and Society*, 35(08), 1565–1586. <http://dx.doi.org/10.1017/S0144686X14000373>
- Department of Social Development. (2016). Government notice R. 1210: Increase in respect of social grants. Retrieved from http://www.gpwonline.co.za/Gazettes/Gazettes/40323_3-10_SocialDevelopment.pdf
- Ferreira, M. (2000). Growing old in the new South Africa. *Ageing International*, 25(4), 32–46. <http://dx.doi.org/10.1007/s12126-000-1009-7>
- Gradín, C. (2013). Race, poverty and deprivation in South Africa. *Journal of African Economies*, 22(2), 187–238. <http://dx.doi.org/10.1093/jae/ejs019>
- Hadar, L., Sood, S., & Fox, C. R. (2013). Subjective knowledge in consumer financial decisions. *Journal of Marketing Research*, 50(3), 303–316. <http://dx.doi.org/10.1509/jmr.10.0518>
- Hayhoe, C. R., Cho, S. H., DeVaney, S. A., Worthy, S. L., Kim, J., & Gorham, E. (2012). How do distrust and anxiety affect saving behavior? *Family and Consumer Sciences Research Journal*, 41(1), 69–85. <http://dx.doi.org/10.1111/j.1552-3934.2012.02129.x>
- Helman, R., Copeland, C., & VanDerhei, J. (2016). *The 2016 retirement confidence survey: Worker confidence stable, retiree confidence continues to increase* (EBRI Issue Brief No. 422). Retrieved from https://www.ebri.org/pdf/briefspdf/EBRI_IB_422.Mar16.RCS.pdf
- Henager, R., & Cude, B. (2016). Financial literacy and long- and short-term financial behavior in different age groups. *Journal of Financial Counseling and Planning*, 27(1), 3–19. <http://dx.doi.org/10.1891/1052-3073.27.1.3>
- Hershey, D. A., Henkens, K., & van Dalen, H. P. (2010). What drives retirement income worries in Europe? A multilevel analysis. *European Journal of Ageing*, 7(4), 301–311. <http://dx.doi.org/10.1007/s10433-010-0167-z>
- Hogarth, J. M., & Anguelov, C. E. (2003). Can the poor save? *Journal of Financial Counseling and Planning*, 14(1), 1–18.
- Holzmann, R., Hinz, R. P., & Gersdorff, H. (2005). *Old-age income support in the 21st century: An international perspective on pension systems and reform*. Washington, DC: World Bank.
- Hosmer, D. W., & Lemeshow, S. (2000). *Applied logistic regression* (2nd ed). New York, NY: John Wiley.
- Howlett, E., Kees, J., & Kemp, E. (2008). The role of self-regulation, future orientation, and financial knowledge in long-term financial decisions. *Journal of Consumer Affairs*, 42(2), 223–242. <http://dx.doi.org/10.1111/j.1745-6606.2008.00106.x>
- Human Sciences Research Council. (2011). *South African social attitudes survey (SASAS) 2011. [Data set]. SASAS 2011 FSB Version 1.0*. Pretoria, South Africa: Human Sciences Research Council.
- Jacobs-Lawson, J. M., & Hershey, D. A. (2005). Influence of future time perspective, financial knowledge, and financial risk tolerance on retirement saving behaviors. *Financial Services Review*, 14(4), 331–344.
- Joo, S. H., & Grable, J. E. (2000). A retirement investment and savings decision model: Influencing factors and outcomes. *Consumer Interests Annual*, 46, 43–48.
- Joo, S. H., & Grable, J. E. (2001). Factors associated with seeking and using professional retirement-planning help. *Family and Consumer Sciences Research Journal*, 30(1), 37–63. <http://dx.doi.org/10.1177/1077727X01301002>
- Joo, S. H., & Pauwels, V. W. (2002). Factors affecting workers' retirement confidence: A gender perspective. *Journal of Financial Counseling and Planning*, 13(2), 1–10.
- Kemp, C. L., Rosenthal, C. J., & Denton, M. (2005). Financial planning for later life: Subjective understandings of catalysts and constraints. *Journal of Aging Studies*, 19(3), 273–290. <http://dx.doi.org/10.1016/j.jaging.2004.08.004>
- Kim, K., & Hanna, S. D. (2015). Do U. S. households perceive their retirement preparedness realistically? *Financial Services Review*, 24, 139–155.
- Kim, J., Kwon, J., & Anderson, E. A. (2005). Factors related to retirement confidence: Retirement preparation and workplace financial education. *Journal of Financial Counseling and Planning*, 16(2), 77–89.
- Malroutu, Y. L., & Xiao, J. J. (1995). Perceived adequacy of retirement income. *Journal of Financial Counseling and Planning*, 6, 17–24.

- Mauldin, T., Henager, R., Bowen, C. F., & Cheang, M. (2016). Barriers and facilitators to saving behavior in low- to moderate-income households. *Journal of Financial Counseling and Planning*, 27(2), 231–251. <http://dx.doi.org/10.1891/1052-3073.27.2.231>
- Munnell, A. H., Golub-Sass, F., Soto, M., & Webb, A. (2008). *Do households have a good sense of their retirement preparedness? (No. 8–11)*. Chestnut Hill, MA: Center for Retirement Research at Boston College.
- Mutran, E. J., Reitzes, D. C., & Fernandez, M. E. (1997). Factors that influence attitudes toward retirement. *Research on Aging*, 19(3), 251–273. <http://dx.doi.org/10.1177/0164027597193001>
- OECD. (2011). Measuring financial literacy: Core questionnaire. In *Measuring financial literacy: Questionnaire and guidance notes for conducting an internationally comparable survey of financial literacy*. Paris, France: OECD, Author.
- OECD. (2012). *Supplementary questions: Optional survey questions for the OECD INFE financial literacy core questionnaire (No.1)*. Paris, France: Author.
- Robb, C. A., & Woodyard, A. (2011). Financial knowledge and best practice behavior. *Journal of Financial Counseling and Planning*, 22(1), 60–70.
- Roberts, J. A., & Sepulveda M, C. J. (1999). Demographics and money attitudes: A test of Yamauchi and Templers (1982) money attitude scale in Mexico. *Personality and Individual Differences*, 27(1), 19–35. [http://dx.doi.org/10.1016/S0191-8869\(98\)00241-4](http://dx.doi.org/10.1016/S0191-8869(98)00241-4)
- Segel-Karpas, D., & Werner, P. (2014). Perceived financial retirement preparedness and its correlates: A national study in Israel. *International Journal of Aging & Human Development*, 79(4), 279–301. <http://dx.doi.org/10.1177/0091415015574177>
- South Africa, National Treasury. (2004). *Retirement fund reform: A discussion paper*. Pretoria, South Africa. Retrieved from www.treasury.gov.za
- South Africa, National Treasury. (2007). *Social security and retirement reform: Second discussion paper*. Pretoria, South Africa. Retrieved from www.treasury.gov.za
- South Africa, National Treasury. (2013). *Charges in South African retirement funds*. Pretoria, South Africa. Retrieved from www.treasury.gov.za
- South Africa, National Treasury. (2016). *Draft amendments to the regulations issued in terms of section 36 of the Pension Funds Act, 1956*. Pretoria, South Africa. Retrieved from www.treasury.gov.za
- Statistics South Africa. (2016). *Quarterly labour force survey: Quarter 3: 2016* (Statistical release No. P0211). Pretoria, South Africa. Retrieved from <http://www.statssa.gov.za/publications/P0211/P02113rdQuarter2016.pdf>
- Stewart, F., & Yermo, J. (2009). *Pensions in Africa (OECD Working Papers on Insurance and Private Pensions No. 30)*. Paris, France: OECD.
- Tang, N., & Baker, A. (2016). Self-esteem, financial knowledge and financial behavior. *Journal of Economic Psychology*, 54, 164–176. <http://dx.doi.org/10.1016/j.joep.2016.04.005>
- United Nations. (2005). *World population prospects: The 2004 revision*. New York, NY. Retrieved from http://www.un.org/esa/population/publications/WPP2004/2004Highlights_finalrevised.pdf
- United Nations. (2015). *World population prospects: The 2015 revision*. New York, NY. Retrieved from https://esa.un.org/unpd/wpp/publications/files/key_findings_wpp_2015.pdf
- Valchev, V. H., van de Vijver, F. J., Nel, J. A., Rothmann, S., & Meiring, D. (2013). The use of traits and contextual information in free personality descriptions across ethnocultural groups in South Africa. *Journal of Personality and Social Psychology*, 104(6), 1077–1091. <http://dx.doi.org/10.1037/a0032276>
- Van Dalen, H. P., Henkens, K., & Hershey, D. A. (2010). Perceptions and expectations of pension savings adequacy: A comparative study of Dutch and American workers. *Ageing and Society*, 30(05), 731–754. <http://dx.doi.org/10.1017/S0144686X09990651>
- Van der Merwe, T. (2004). The occupational pillar of the South African pension system. *Development Southern Africa*, 21(2), 303–327. <http://dx.doi.org/10.1080/0376835042000219569>
- Xiao, J. J., Tang, C., Serido, J., & Shim, S. (2011). Antecedents and consequences of risky credit behavior among college students: Application and extension of the theory of planned behavior. *Journal of Public Policy & Marketing*, 30(2), 239–245. <http://dx.doi.org/10.1509/jppm.30.2.239>
- Yamauchi, K. T., & Templer, D. J. (1982). The development of a money attitude scale. *Journal of Personality Assessment*, 46(5), 522–528. http://dx.doi.org/10.1207/s15327752jpa4605_14