



# The Relationships Among Aging Stereotypes, Aging Anxiety, Social Support, Religiosity, and Expected Health Among Colombians

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## Abstract

The population of older adults is rapidly increasing throughout the world, particularly in Latin American countries. This increase makes it imperative to examine psychosocial perceptions and expectations of aging among these populations, which to date have received little research attention. This study aims to test two models of the associations among psychosocial perceptions, expectations of aging, and religiosity among 544 individuals (52.4% female) whose age ranged from 18 to 59 years ( $M = 31.7$ ) living in Bogota, Colombia. The first model examines associations among psychosocial perceptions and psychosocial aging outcomes, while the second examines associations between these constructs and religiosity. The first model indicates that three major psychosocial predictors (social support, positive and negative aging stereotypes) are uniquely associated with three psychosocial aging outcomes (expected aging-related support, aging anxiety, expected health). The second model indicates that higher religiosity is associated with higher perceived current social support and expected aging-related support, greater endorsement of positive aging stereotypes, and lower reported aging anxiety. Results extend the literature on psychosocial perceptions and expectations of aging to Colombia and suggest that religiosity may play an important role in shaping psychosocial expectations and perceptions of aging in Colombia.

**Keywords** Ageism · Aging beliefs · Expectations of aging · Latin America · Perceptions

## Introduction

The population of older adults continues to increase around the world. The World Health Organization expects the population of adults 60 years or older to reach 2 billion by 2050 and outnumber children younger than 5 by 2020 (WHO 2015a). Although an increasing aging population has been a concern in some parts of the world for decades, a rapid demographic transformation is taking place in other parts of the world. In fact, newly industrialized or developing countries are experiencing the most rapid changes compared to more developed regions, where the population over 60 years of age already constitutes 25% or more of the population (Bloom et al. 2011).

As people are living longer on average than in previous generations, countries increasingly need to consider how to support their growing older population (National Institute of Aging 2011). At the same time, ageism (stereotyping and prejudice toward older adults) is increasing (Ng et al. 2015). As such, there is a need to address stereotypes about aging (e.g., older adults are sick, forgetful, lonely), especially in rapidly changing societies (e.g., developing nations). Most of the empirical research on the stereotypes older adults face and whether they receive support from their family and community has been concentrated in Western countries (Levy and MacDonald 2016; Nelson 2002; Palmore 1990). Thus, it is imperative to extend the study of stereotypes and expectations of aging to other regions, such as Latin America (Glaser et al. 2006; Levy and MacDonald 2016; Montero-López Lena and Rivera-Ledesma 2009). Exploring the role of beliefs about aging and expected aging-related social support from family, religious organizations, and the government is needed, as their association with aging stereotypes may vary from country to country and may be culturally bound.

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Few studies have examined aging stereotypes in Colombia, the third most populous Latin American country, with a population of 48 million people (WHO 2015b). One exception, a recent study by Ramírez and Palacios-Espinosa (2016), examined both positive and negative aging stereotypes, current social support, expected aging-related support, and aging anxiety (concerns about growing older). Ramírez and Palacios-Espinosa sampled 215 Colombian adults aged 44 and over ( $M=59$ ) and found that endorsing more negative stereotypes about older adults and greater expectations of aging-related support predicted more aging anxiety. Additionally, they found that endorsing more negative stereotypes about older adults and more aging anxiety predicted poorer expected mental health and marginally more expected aging-related social support. Findings from Ramírez and Palacios-Espinosa (2016) suggest that some of the same key variables (e.g., stereotyping, social support, aging anxiety) that have been examined in aging research in Western cultures are relevant to understanding aging and health outcomes in Colombia.

Ramírez and Palacios-Espinosa's (2016) study was one of the first to examine associations between psychosocial concerns and expectations of aging in Colombia. However, given its sample size and limited age range, numerous questions about the interrelationships among these factors in Colombia remain unexplored. In order to advance the literature and our understanding of aging issues, the current investigation includes a larger sample of Colombian adults with a wider age range than previous research to examine perceptions and expectations of aging across adulthood and to conduct detailed analyses investigating the interrelations among psychosocial perceptions (stereotypes about aging, social support) and expected outcomes (health expectations, aging anxiety, expected social support). The present investigation uniquely examines these psychosocial variables' associations with religiosity and expected aging-related support from one's religious organization, which may provide unique insight into psychosocial issues of aging in Latin America and Colombia specifically. Next, we review the relevant literature upon which the models tested in this study were developed.

## Aging Stereotypes

Stereotypes about older adults are pervasive and endorsed by adults of all ages in Western cultures (Nelson 2002; Palmore 1990). These stereotypes can be positive (e.g., calm, wise) or negative (e.g., cranky, sick), although negative stereotypes about older adults appear to be more prevalent than positive stereotypes, especially in Western cultures (Levy and Macdonald 2016; Nelson 2002; Palmore 1990), prompting research to primarily focus on the detrimental effects of

negative aging stereotypes. A body of research conducted in Western cultures and among individuals predominately of European descent illustrates the widespread negative cognitive and health consequences of endorsing negative aging stereotypes (Abrams et al. 2006; Chrisler et al. 2016; Levy et al. 2009). For example, studies demonstrate that individuals who reported positive perceptions of aging are less likely to experience a cardiovascular event (Levy et al. 2009) and live, on average, 7.5 years longer (Levy et al. 2002). Age stereotypes also affect cognition as indicated by a meta-analysis which found that the memory and cognitive performances of older adults are impacted by age-based stereotype threat (Lamont et al. 2015).

In contrast to the aforementioned body of literature regarding age stereotypes and health among European and European Americans, only a few studies have explored aging stereotypes in Latin America. One study examining aging concerns among older Colombians found that aging is associated with more negative traits (e.g., illness, dependency, physical deficits) than with positive traits (e.g., wisdom; Castellanos and López 2010). Recently, Ramírez and Palacios-Espinosa (2016) created a scale of aging stereotypes specific to Colombia that is similar in structure to the Image of Aging Scale developed by Levy et al. (2004). They found some of the same positive (wise, family-oriented) and negative stereotypes (lonely, grumpy) as Levy and colleagues (2004) and some unique positive (experienced, generous) and negative stereotypes (stubborn). This highlights that aging stereotypes vary to some extent from culture to culture. As such, we used the culturally specific aging stereotype measure developed by Ramírez and Palacios-Espinosa (2016) in the current study.

## Aging Anxiety

Given the prevalence of negative stereotypes about aging and older adults, it is not surprising that anxiety about aging is prevalent in Western cultures, with fear of losing independence, deteriorating health, and loneliness fueling aging anxiety (Bousfield and Hutchison 2010). Although less researched than aging stereotypes, aging anxiety also appears to have important implications for health (Brunton and Scott 2015). Aging anxiety can occur among adults of any age (Brunton and Scott 2015) and is prevalent among young adults (Cummings et al. 2000). Similar to research on aging stereotypes, these studies tend to be conducted in Western cultures and among samples of predominately European descent.

Aging anxiety has been examined in two studies conducted in Latin America. Among Mexicans, knowledge that someone will be available to provide care and support for oneself in old age was associated with reduced anxiety

toward aging (Montero-López Lena and Rivera-Ledesma 2009). Similarly, Ramírez and Palacios-Espinosa (2016) found that aging anxiety was predicted by a perceived lack of social support and negative stereotyping.

## Social Support—Family

Little research has examined the associations between social support and perceptions and expectations of aging. However, research does suggest a link between social support and attitudes toward aging, indicating that satisfaction with social support is associated with more positive attitudes toward aging (Park et al. 2015). Research from Mexico suggests aging-related social support, such as knowing that someone will be there to provide advice in the future, can reduce anxiety toward aging (Montero-López Lena and Rivera-Ledesma 2009). Similarly, perceived social support predicted less aging anxiety among Colombians (Ramírez and Palacios-Espinosa 2016). In Latin America, the family unit plays a crucial role as a mechanism for social support, with Latino culture emphasizing close, warm relationships with one's family (Campos et al. 2014). The importance of social support, especially aging-related support, appears to be critical for aging Latinos, underscoring the importance of continued exploration of social support and aging-related support among this population.

## Religion and Aging

Over the past few decades, a growing body of research examining the association between religion and aging has emerged (Levin et al. 2011). This literature suggests that religiosity is related to various positive mental and physical health outcomes among aging adults (Levin et al. 2006). Much of the empirical research on religion and aging has explored religion's association with health among older adults (Levin and Chatters 2008, 1998), which has been conducted primarily in Western countries (Koenig et al. 2001; Levin and Chatters 2008). Only a few studies have explored the influence of religion on health and aging in Latin America. One study found that higher religiosity was associated with better self-reported health among individuals 60 years or older in Latin America (Reyes-Ortíz et al. 2007), while another study conducted in Mexico, found no association between religiosity and perceptions of health (Rivera-Ledesma and Montero-López Lena 2014), suggesting mixed results.

Religion may be associated with better physical health via social support gained through involvement in a religious community and religious beliefs may aid in coping with stress, thereby reducing the detrimental effects of

stress on physical health (Ellison et al. 2001). Participation in a religious community is associated with higher reported social support (Merino 2014; Krause and Hayward 2014). In fact, religious communities can serve as a type of extended family and provide social and aging-related support (Grefe 2011). In addition, religious communities facilitate intergenerational contact (Grefe 2011; Seymour 2005), which is an essential ingredient for reducing ageism based on the tenets of intergroup contact theory (Pettigrew 1998).

Despite existing research on the associations between religion and health, no studies have examined the relationship between religion and aging perceptions and expected outcomes among Colombians. Colombia is a religious country with the vast majority of Colombians identifying as Christians (approximately 90%), whereas only about 4.7% of the population identify as Atheists or Agnostics (Beltrán 2012; CIA 2016). Given the association between religiosity, health, and aging in Western countries (Levin and Chatters 2008), it seems likely that, in a country as religious as Colombia, religiosity may play a role in Colombians' perceptions and expectations of aging. Of note, Christianity promotes respect for elders, and the Old Testament portrays older adults and aging positively (Knapp 1976). In addition, adults are often respected and valued in religious contexts (Grefe 2011). This suggests that religiosity may predict the endorsement of more positive aging stereotypes, less aging anxiety, and less negative aging stereotypes.

It is essential to study the potential buffering role of religiosity as older populations are at increased risk for negative social outcomes, such as poverty, disability, and abandonment, compared to other at risk populations in Colombia (Ocampo et al. 2006). Religious organizations may provide social and emotional support during the aging process, thus improving expectations for the future and helping to reduce uncertainty (Beltrán 2013; Reyes-Ortíz et al. 2007).

## Current Study

The first goal of this study was to investigate the interrelations among key psychosocial variables (i.e., stereotypes about older adults, aging anxiety, and social support) and expected health for the first time among a Latin American sample. Although Ramírez and Palacios-Espinosa's (2016) exploratory study provided a valuable and much-needed basis for future research to build on, analyses were limited by the small sample size and restricted age range of participants. These limitations prevented an in-depth exploration of the associations among aging stereotypes, expectations of health, aging-related support, aging anxiety, and social support. A second goal unique of this study was to explore the relationships between religiosity and these psychosocial variables, which may provide unique insight into psychosocial

issues of aging in Latin America and Colombia specifically. It should be noted that while the variables included in this study were selected based on the aforementioned literature review, the associations among this set of variables have not been examined simultaneously, using approaches like structural equation modeling. Therefore, findings from the current investigation have the potential to advance the broader literature on perceptions and expectations of aging, which has been mostly conducted in Western countries.

## Hypotheses

Since this study focuses on an understudied population and most of the literature has not focused on the role of religiosity, we examined two models—a model built on the established literature and a second model including religiosity in which we tested some exploratory links. The first model (see Fig. 1) focused on the expected associations between three predictors (current social support, negative, and positive aging stereotypes) and three expectations about aging (aging anxiety, expected aging-related support from family, and expected health in old age). Based on the aforementioned literature, we expected that higher current social support, more positive aging stereotypes, and less negative aging stereotypes will predict more expected aging-related support, less aging anxiety, and better expected health. We also expected that aging anxiety and expected health will be positively correlated with one another.

The second set of analyses examined the direct and indirect effects of religiosity on stereotypes about aging, current social support, and perceptions and expectations of aging (aging anxiety, expected aging-related support from family, and expected health in old age). We expected that

religiosity would be associated with more current social support, positive aging stereotypes, expected aging-related support; less negative aging stereotypes, aging anxiety; and better expected health. We also expected that religiosity would predict aging anxiety, expected aging-related support, and expected health via our predictors from the first model (current social support, negative and positive aging stereotypes). Specifically, we hypothesized that religiosity would predict more current social support and endorsement of positive aging stereotypes and less endorsement of negative stereotypes. More current social support and endorsement of positive aging stereotypes and less endorsement of negative aging stereotypes, in turn, are expected to predict greater expected aging-related support, less aging anxiety, and better expected health.

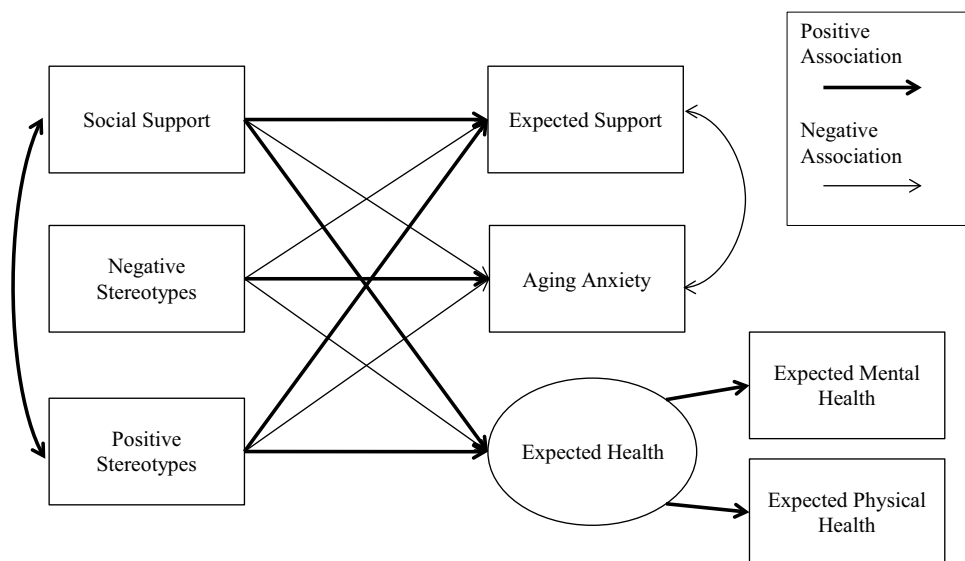
Finally, we explored differences in the hypothesized models across two age groups: younger (18–35 years old) and middle-aged (36–59 years old), using invariance testing. Age groups were based on classifications used by Kite et al. (2005) in their meta-analysis on ageism. Given the lack of research on these constructs in Colombia, we did not make hypotheses regarding differences between models across age groups.

## Method

### Participants

Participants included 544 individuals (52.4% female) whose age ranged from 18 to 59 years ( $M = 31.7$  and  $SD = 11.7$ ) living in Bogotá, Colombia. These numbers are representative of the greater Colombian population. According to the United Nations (2014), males represent 49% of the

**Fig. 1** Hypothesized model of association among current social support, positive and negative stereotypes about older adults, expectations about aging, and aging anxiety. We also hypothesized that aging anxiety and expected health would be positively correlated but do not include that correlation for figure clarity



population, while females represent 51% of the population. The median age for males is 28.7 and 30.6 years for females (CIA 2016). Participants were recruited from the community using a convenience sampling method described below. Most participants were not married (65.8%), were currently working (68.9%), and reported a medium socioeconomic status (50.4%; low .6%, low to medium 9.0%, medium to high, 32.2%, high 7.9%). The majority of our sample reported some university education (33.6%) or a university degree (27.8%), with a sizeable minority reporting high school education or less (15.8%), graduate education (13.9%), or technical school education (9.0%).

## Procedure

Four research assistants approached participants in public parks, malls, and bus terminals, asked for consent, and then provided a survey packet. Participants were given enough space to answer privately; however, research assistants remained nearby in case participants needed help. The survey took on average 30 min to complete. The university's institutional review board (IRB) approved the current study prior to any data collection.

## Measures

All measures were translated and back-translated from English to Spanish by two bilingual translators with the exception of the stereotype measure which was already established in Spanish.

### Stereotyping Measure (Ramírez and Palacios-Espinosa 2016)

Participants rated to what extent they endorsed eight positive: loving, wise, enjoys life moments, experienced, patient, calm, family-oriented, generous ( $\alpha = .79$ ) and eight negative: sick, forgetful, stubborn, lonely, grumpy, sad, tired, and dying ( $\alpha = .84$ ) traits that described a 65-year-old person on a seven point scale: 1 (*not at all characteristic*) to 7 (*very characteristic*).

### Perceived Social Support (Ramírez and Palacios-Espinosa 2016; Macdonald and Levy 2016)

Participants answered eight items designed to assess social support using a scale of 1 (*never*) to 7 (*always*). Participants indicated perceived social support with co-workers, church members, friends, and family ( $\alpha = .70$ ). "How often are your X willing to listen to your problems" and "How often do you get help and support from your X."

### Expected Aging-Related Support from Family (Ramírez and Palacios-Espinosa 2016; Macdonald and Levy 2016)

Participants answered a single item designed to assess expected aging-related support from family ("I expect that my family will take care of me when I get older") using a scale of 1 (*strongly disagree*) to 7 (*strongly agree*).

### Aging Anxiety (Bousfield and Hutchinson 2010)

Participants completed a 3-item measure designed to measure their anxiety about aging ( $\alpha = .60$ ) using a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. Items include "I do not want to get old because it means that I am closer to death," "I am relaxed about getting old," "I am worried that I will lost lose my independence when I am old," and "I am concerned that my abilities will suffer when I am old."

### Expected Health (Ramírez and Palacios-Espinosa 2016)

Participants answered two items to assess their expected future physical and mental health. Participants reported their evaluations on a 1 (*poor*) to 5 (*excellent*) scale. Items include "In general, how do you expect your physical [mental] health to be when you are old?" These items were treated as indicators of an expected health latent variable.

## Religiosity

Similar to Levin et al. (1996, 1998), we used a 1-item measure designed to assess participants' religiosity. Participants responded on a 7-point scale from 1 (*not at all*) to 7 (*extremely*) to the question "How religious do you consider yourself?" Religious affiliation was not assessed in light of past research indicating little variability in religious affiliation (e.g., 90% of Colombians identifying as Christian; Beltrán 2012; CIA 2016).

## Statistical Analyses

Analyses were conducted using Mplus Version 7 (Muthén and Muthén 2012). Structural equation modeling was used to test the proposed models. Robust maximum likelihood estimation was used for both models. Model fit was assessed by the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root-mean-square error (RMSEA), with acceptable model fit indicated by a CFI and TLI  $> .90$  and an RMSEA  $< .06$  (Bentler and Bonett 1980; Browne and Cudeck 1993; Kline 2005). We conducted Chi-square tests of model fit, but we evaluated



them with the caveat that this test can be overpowered in moderately sized samples, and thus reject even good fitting models.

Invariance testing across groups was conducted using changes in three parameters between models: Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Satorra–Bentler chi-squared difference test. Lower AIC and BIC values indicate a more parsimonious and better fitting model. A difference of ten points between two BIC values is associated with 150 to 1 odds that the model with the lower BIC value is superior (150:1 odds are associated with a  $p$  value of  $<.001$ ), while a difference of six points between two BIC values is associated with 20–1 odds that the model with the lower BIC value is superior (20:1 odds are associated with a  $p$  value of  $<.05$ ), and a difference of 2 or less indicates little difference between the two models (Raftery 1995). Similarly, a difference of ten points between two AIC values indicates that the model with the lower AIC value is substantially superior, while a difference of 4–7 points indicates the model with the lower AIC is considerably superior, and a difference of two points or less indicating little difference between the two models (Burnham and Anderson 2002). A significant modification index, in which the predicted change in chi-squared associated with releasing a constrained path is significant, indicates this path should be released (Byrne et al. 1989).

## Results

There was less than 1% missing data, which was handled using full information maximum likelihood estimation (Muthén and Muthén 2012). Table 1 includes means, standard deviations, and correlations among major study variables. Age, gender, socio-economic status, marital status, and working status were controlled for in both models. Given a high correlation ( $r = .70$ ,  $p < .001$ ) between

expected physical and mental health in old age, expected health was modeled as a latent variable indicated by expected physical and mental health.

## Model of Social Support, Stereotypes, and Aging

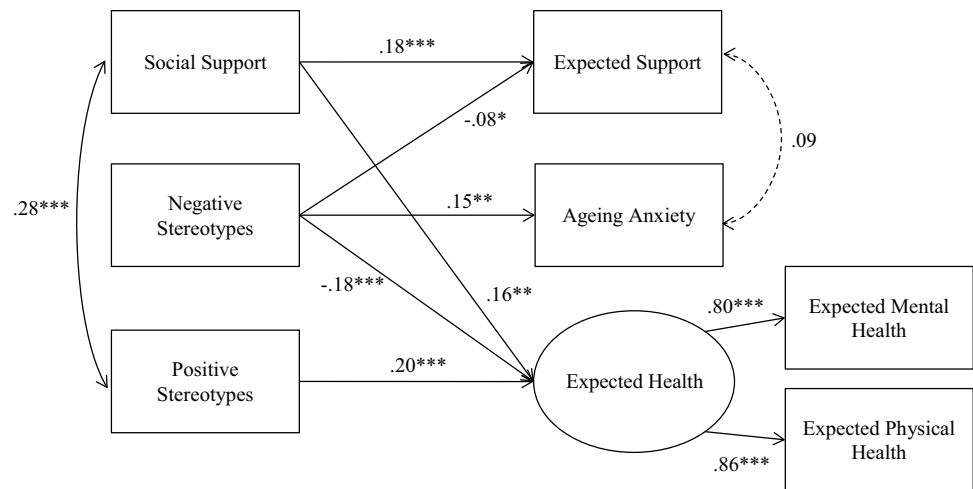
We tested our first hypothesized model using structural equation modeling. In this model, there are three predictors (current social support, positive stereotypes, and negative stereotypes) each predicting three outcomes (expected aging-related support, aging anxiety, and expected health). Age, marital status, SES, gender, and employment status were controlled for in all model paths. Given significant correlations between current social support and positive stereotypes (predictors), between expected aging-related support and aging anxiety (outcomes), and between expected health and aging anxiety (outcomes), the residual variances of these variables were allowed to covary in the model. The hypothesized model fit the data well ( $\chi^2[11] = 10.53$ ,  $p = .48$ ; CFI = 1.00; TLI = 1.00; RMSEA  $<.001$ ); however, three of our hypothesized paths were non-significant, including the paths from positive stereotypes to expected aging-related support ( $\beta = -.01$ ,  $p = .87$ ) and from social support and positive stereotypes to aging anxiety ( $\beta = -.06$ ,  $p = .20$ ;  $\beta = .04$ ,  $p = .42$ , respectively). These paths were trimmed from the model. The trimmed final model (see Fig. 2; Table 2) also fit the data well ( $\chi^2(14) = 12.48$ ,  $p = .57$ ; CFI = 1.00; TLI = 1.01; RMSEA  $<.001$ ). As hypothesized, higher current social support predicted higher expected aging-related support from family and better expected health. Additionally, more endorsement of negative stereotypes predicted more aging anxiety, less expected aging-related support from family, poorer expected health. More endorsement of positive stereotypes predicted better expected health.

**Table 1** Correlations among major study variables

Variable	1	2	3	4	5	6	7	8	9
Age	–	.16**	–.14**	.13**	–.01	–.05	–.06	–.02	–.07
Religiosity		–	.30**	.15**	–.02	.11*	–.11**	–.03	–.04
Current social support			–	.26**	.003	.18**	–.03	.18**	.19**
Positive stereotyping				–	–.03	.04	.01	.22**	.17**
Negative stereotyping					–	–.08	.14**	–.15**	–.15**
Expected support—family						–	.19**	.02	–.01
Aging anxiety							–	.05	.02
Expected physical health								–	.69**
Expected mental health									–
M	31.67	3.47	3.79	4.41	3.17	3.54	3.91	2.72	2.89
SD	11.75	1.58	.89	.75	1.05	1.98	1.23	.86	.85

\* $p < .05$ , \*\* $p < .01$

**Fig. 2** Expectations and anxiety about aging predicted by current social support and positive and negative stereotypes about older adults. A correlation between the residuals of aging anxiety and expected health was also included but not depicted for figure clarity ( $r = .20, p < .001$ ). Age, gender, socio-economic status, marital status, and working status controlled for. Model fit:  $\chi^2(14) = 12.48$ ,  $p = .57$ ; CFI = 1.00; TLI = 1.01; RMSEA < .001



**Table 2** Paths in structural equation model

Outcome	Predictor	$\beta$	SE	$z$	$p$
Expected health	Positive stereotypes	.20	.05	4.23	<.001
	Negative stereotypes	-.18	.04	-3.98	<.001
	Current social support	.16	.05	3.30	.001
	Age	-.12	.05	-2.29	.02
	SES	-.04	.05	-.77	.44
	Gender	.03	.05	.74	.46
	Marital status	.07	.05	1.38	.17
Expected support	Employment status	.11	.05	2.33	.02
	Negative stereotypes	-.08	.04	-2.00	.04
	Current social support	.18	.04	4.27	<.001
	Age	-.01	.05	-.25	.80
	SES	.02	.04	.45	.65
	Gender	.07	.04	1.71	.09
	Marital status	-.02	.05	-.23	.75
Aging anxiety	Employment status	-.02	.04	-.55	.58
	Negative stereotypes	.15	.04	3.46	.001
	Age	-.03	.05	-.64	.52
	SES	.03	.04	.74	.46
	Gender	.07	.04	1.71	.09
	Marital status	-.03	.05	-.59	.55
	Employment status	-.05	.04	-1.19	.24

### Invariance Testing

Given that the above model may fit differently for different age groups, invariance of the model across two age groups was examined: younger (18–35 years old) and middle-aged (36–59 years old) participants. Non-significant paths trimmed from the model tested on the full sample were retained in the multigroup model to test whether these

paths were similar for the two groups. The steps taken to test model invariance are presented in Table 3. In addition to examining changes in AIC and BIC and Satorra–Bentler chi-squared tests to determine variance or invariance across models, modification indices for constrained models were also examined. Parameters that were not invariant across groups are presented in Table 4. Invariance testing indicated that while several variable means and paths from control variables to major variables of interest varied across groups, all but one of the major model paths (factor loadings, regression paths, and correlations among variables of interest) were invariant across the younger and middle-aged groups. Of note, higher perceived support significantly predicted better expected health among the younger subsample, but did not predict expected health in the middle-aged sample.

Minor variations in model parameters across groups are described next. Significantly more variance in expected physical health was captured by the expected health latent variable in the middle-aged group compared to the younger group. This indicates differences in the residual variance for expected physical health (variance in expected physical health not explained by the model) across groups. In other words, there was a significantly larger proportion of variance in expected physical health that was not explained by the model in the younger age group compared to the middle-aged group. Among middle-aged participants, being younger predicted better expected physical health, while age did not predict expected health among the younger sample. Associations between marital status and expected health/expected support varied significantly between groups, but these paths were significant in neither group. Finally, in the context of the model, the middle-aged sample was more likely to be married and employed, but reported slightly lower SES compared to the younger sample. The middle-aged group also reported lower positive stereotypes and perceived support compared to the younger sample in the context of the model.

**Table 3** Invariance testing

Model	AIC	BIC	SB $\chi^2$ (df)	Com- parison to model	$\Delta$ AIC	$\Delta$ BIC	SB $\chi^2$ difference test (df)
1. Unconstrained	17175.41	17871.84	(18) 15.30				
2. Factor loadings constrained	17174.47	17862.3	(20) 17.90	1	-.94	-9.54	(2) 2.42, $p = .30$
3. Indicator and factor intercepts constrained	17180.23	17859.46	(22) 27.78	2	5.76	-2.84	(2) 9.83, $p = .007$
3a. Invariant intercepts unconstrained	17174.26	17857.8	(21) 19.79	2	-.21	-4.50	(1) 1.96, $p = .16$
4. Residuals of indicators and factor constrained	17180.15	17855.08	(23) 27.57	3a	5.89	-2.72	(2) 5.16, $p = .07$
4a. Invariance residuals unconstrained	17173.57	17852.8	(22) 20.39	3a	-0.69	-5.00	(1) .74, $p = .39$
5. Model paths constrained	17166.71	17807.25	(31) 31.55	4a	-6.86	-45.55	(9) 11.21, $p = .26$
5a. Invariant paths unconstrained	17162.97	17807.81	(30) 25.72	4a	-10.60	-44.99	(8) 5.58, $p = .69$
6. Correlations constrained	17156.37	17784.01	(34) 26.71	5a	-6.60	-23.80	(4) .03, $p = .999$
7. Control paths constrained	17157.97	17721.14	(49) 57.81	6	1.60	-62.87	(15) 31.47, $p = .008$
7a. Invariant paths unconstrained	17148.27	17724.33	(46) 42.37	6	-8.10	-59.68	(12) 15.76, $p = .20$
8. Means constrained	17274.16	17811.53	(55) 181.51	7a	125.89	87.20	(9) 135.24, $p < .001$
8a. Invariance means unconstrained	17143.59	17702.45	(50) 45.65	7a	-4.68	-21.88	(4) 3.27, $p = .51$

The constraints listed under “Model” indicate the constraints added or released compared to the previous model. Factor means and variances were constrained at 1 and 0, respectively, to allow for model convergence. The factor mean for the middle-aged group was allowed to vary starting in Model 3a based on a significant modification index

SB Satorra–Bentler; AIC Akaike Information Criterion; BIC Bayesian Information Criterion

**Table 4** Variant parameters

Parameter	MI	Younger group				Middle-aged group			
		Parameter	SE	$z$	$p$	Parameter	SE	$z$	$p$
Expected health mean	7.75	.00	—	—	—	3.21	1.14	2.82	.01
Expected physical health residual	7.07	.21	.09	2.24	.02	.08	.09	.85	.39
Expected health on perceived support	5.54	.23	.05	4.32	< .001	.02	.07	.29	.77
Expected health on age	7.96	.05	.07	.74	.47	-.24	.07	-3.32	.00
Expected health on marital status	4.43	.09	.07	1.32	.19	-.07	.07	-.89	.37
Expected support on marital status	4.21	-.10	.06	-1.81	.07	.10	.07	1.38	.17
Mean of marital status	60.46	.20	.02	—	—	.65	.04	—	—
Mean of employment status	10.86	.63	.02	—	—	.82	.03	—	—
Mean of positive stereotypes	5.95	4.35	.04	—	—	4.56	.06	—	—
Mean of perceived support	5.45	3.87	.04	—	—	3.63	.07	—	—
Mean of SES	3.84	3.45	.04	—	—	3.24	.06	—	—

MI modification index; values represent chi-squared value on 1 degree of freedom. Standardized regression coefficients and correlations are presented

## Religiosity and Aging

Next, we examined the direct associations between religiosity and other variables of interest in a structural equation model, controlling for the effects of age, marital status, SES, gender, and employment status. Results indicate that higher religiosity predicted higher perceived current social support and expected aging-related support, more endorsement of positive aging stereotypes, and less aging anxiety. Religiosity did not significantly predict endorsement of negative stereotypes or expected health. See Table 5.

Given that religiosity did not significantly predict endorsement of negative aging stereotypes, indirect effects of religiosity through negative aging stereotypes were not examined. However, despite the non-significant association between religiosity and expected health, the indirect effects of religiosity through current social support and endorsement of positive stereotypes were examined. The examination of indirect effects in the absence of a significant direct effect is considered appropriate (see Hayes 2009, 2013; Shrout and Bolger 2002).



**Table 5** Religiosity predicting aging-related variables

Outcome	Predictor	$\beta$	SE	$z$	$p$
Current social support	Religiosity	.33	.04	8.37	<.001
	Age	-.20	.05	-4.18	<.001
	SES	.09	.04	2.17	.03
	Gender	.04	.04	.92	.36
	Marital status	-.01	.05	-.26	.80
	Employment status	.07	.04	1.75	.08
Negative aging stereotypes	Religiosity	-.03	.04	-.69	.49
	Age	.01	.05	.13	.90
	SES	-.14	.04	-3.25	.001
	Gender	.002	.04	.05	.96
	Marital status	-.04	.05	-.75	.46
	Employment status	-.03	.04	-.78	.43
Positive aging stereotypes	Religiosity	.13	.04	3.10	.002
	Age	.10	.05	2.04	.04
	SES	.12	.04	2.86	.004
	Gender	.03	.04	.71	.47
	Marital status	.02	.05	.38	.70
	Employment status	.05	.04	1.24	.22
Expected aging-related support	Religiosity	.10	.04	2.38	.02
	Age	-.06	.05	-1.09	.27
	SES	.05	.04	1.15	.25
	Gender	.07	.04	1.58	.11
	Marital status	-.01	.05	-.27	.29
	Employment status	-.01	.04	-.18	.85
Aging anxiety	Religiosity	-.13	.04	-2.94	.003
	Age	-.01	.05	-.16	.87
	SES	.002	.04	.05	.96
	Gender	.10	.04	2.27	.02
	Marital status	-.04	.05	-.78	.44
	Employment status	-.06	.04	-1.27	.20
Expected health	Religiosity	-.04	.05	-.80	.43
	Age	-.09	.06	-1.32	.19
	SES	.03	.04	.70	.48
	Gender	.08	.04	1.75	.08
	Marital status	.09	.05	1.81	.07
	Employment status	.12	.06	2.10	.04

Next a series of three indirect effects models were examined. In each model, religiosity predicts the mediators (current social support and endorsement of positive aging stereotypes), and religiosity and the mediators predict the outcome variable (aging anxiety, expected health, expected aging-related support). Bootstrapped (5000 resamples) confidence intervals for the indirect effects were used to determine the significance of indirect effects. Age, marital status, SES, gender, and employment status were controlled for in all model paths. Results indicate that religiosity had a significant indirect effect on expected aging-related support through current social support. Higher religiosity predicted higher current social support, which in turn predicted higher

expected aging-related support. Additionally, religiosity had a significant indirect effect on expected health through current social support and positive stereotypes. In this model, higher religiosity predicted higher current social support and endorsement of positive stereotypes, which in turn predicted better expected health. Religiosity did not have an indirect effect on aging anxiety through either current social support or endorsement of positive stereotypes or on expected aging-related anxiety through endorsement of positive stereotypes. Path coefficients and indirect effects are presented in Table 6.

To determine whether tests of moderated mediation by age were necessary, a number of analyses examining

**Table 6** Indirect effects of religiosity

Outcome	Mediator	Path	$\beta$	$z$	$p$	Indirect effect (95% CI)
Expected aging-related support	Current social support	Religiosity to current social support	.33	7.36	< .001	.019 to .105
		Current social support to expected support	.15	3.15	.002	
	Positive stereotypes	Religiosity to positive stereotypes	.13	3.02	.003	– .017 to .014
		Positive stereotypes to expected support	– .01	– .02	.85	
Aging anxiety	Current social support	Religiosity to expected support	.06	1.15	.25	
		Religiosity to current social support	.33	7.36	< .001	– .030 to .022
	Positive stereotypes	Current social support to aging anxiety	– .02	– .33	.74	
		Religiosity to positive stereotypes	.13	3.02	.003	– .007 to .015
		Positive stereotypes to aging anxiety	.04	.85	.39	
Expected health	Current Social Support	Religiosity to aging anxiety	– .13	–2.50	.01	
		Religiosity to current social support	.33	7.36	< .001	.013 to .071
	Positive stereotypes	Current social support to expected health	.19	3.25	.001	
		Religiosity to positive stereotypes	.13	3.02	.003	.003 to .034
		Positive stereotypes to expected health	.21	4.12	< .001	
		Religiosity to expected health	– .14	–2.33	.02	

interactions between age and religiosity predicting mediators and outcomes from the indirect effects models were examined. Interactions between mediators and age predicting outcomes from the indirect effects models were also examined. As none of these interactions were significant, we did not pursue moderated mediation models examining age as a moderator of the above tested mediations. Given that these interactions were all non-significant, they are not reported in detail.

## Discussion

Ageism and the rapid aging of the world's population are increasing simultaneously (Ng et al. 2015; WHO 2015b), resulting in an urgent need for understanding the roles of and associations between psychosocial perceptions and expectations of aging worldwide. The present investigation examined these pressing issues in Colombia, the third most populous Latin American country. The study considered the interrelations among a set of key variables identified by prior research—social support, positive and negative aging stereotypes, religiosity, expected aging-related support, and aging anxiety (Bousfield and Hutchison 2010; Castellanos and López 2010; Merino 2014; Ramírez and Palacios-Espinosa 2016).

The hypothesized models were largely supported, indicating a set of interrelationships among key psychosocial variables. The first model indicated that three major psychosocial predictors (social support and positive and negative aging stereotypes) uniquely predicted three psychosocial aging outcomes (expected aging-related support, aging anxiety, and expected health). Expected aging-related support was

only predicted by current social support and not by positive and negative stereotypes. Although the lack of association between expected aging-related support and stereotypes about older adults were contrary to our hypotheses, these findings are in line with the only other study of these variables conducted in Colombia (Ramírez and Palacios-Espinosa 2016). This indicates that the extent of one's current social support network predicts the perceived availability of a future support network for aging-related needs, while stereotype endorsement does not.

Aging anxiety was only predicted by negative stereotypes, not positive stereotypes or social support. Although the lack of an association between positive stereotype endorsement and aging anxiety was contrary to our hypothesis, it was also in line with past research (Ramírez and Palacios-Espinosa 2016). This is also consistent with findings that negative attitudes toward aging can prime aging anxiety (Allen and Johnson 2009; Chonody et al. 2014). Social support may not have functioned as a predictor of aging anxiety because it may instead function as a moderator of the association between negative stereotype endorsement and aging anxiety instead of as a direct predictor. Additionally, expected aging-related support was positively associated with aging anxiety, which matches the findings of Ramírez and Palacios-Espinosa (2016). We propose that this association indicates that individuals with higher aging anxiety expect to need more aging-related support, although future research should explore more detailed variables to capture the nuances of expected aging-related social support. For example, future research might ask participants about the availability of an individual or network to provide aging-related support in addition to the extent to which one expects to need aging-related support.

Finally, better expected health was predicted by perceptions of more current social support and the endorsement of positive aging stereotypes and less negative stereotype endorsement. The associations revealed by these models are largely consistent with those of previous research examining these variables among Colombians and in Western cultures (Levy et al. 2009, 2002; Ramírez and Palacios-Espinosa 2016).

Of note, the first hypothesized model was similar across younger and middle-aged age groups. Only one major model path differed across age groups. Higher perceived support significantly predicted better expected health among the younger subsample, but did not predict expected health in the middle-aged sample. The overall similarity of fit for the model across younger and middle-aged samples indicates that associations between the psychosocial predictors (social support and positive and negative aging stereotypes) and psychosocial aging outcomes (expected aging-related support, aging anxiety, and expected health) are similar for younger and middle-aged samples. Similarly, age did not moderate the associations between religiosity, psychosocial predictors, and psychosocial outcomes, suggesting that these associations may be similar across the age range examined in this sample. We did not examine adults 60 or over in the current sample, so future research should examine whether these associations differ for older adults.

The second set of analyses indicates that religiosity may play an important role in psychosocial expectations and perceptions of aging in Colombia. Higher religiosity predicted higher perceived current social support and expected aging-related support, more endorsement of positive aging stereotypes, and less aging anxiety. These findings are consistent with previous research in this area (Bousfield and Hutchinson 2010; Ramírez and Palacios-Espinosa 2016). Results also indicate that a significant proportion of the association between religiosity and higher expected aging-related support is explained by higher current social support. Similarly, there was a significant indirect effect of religiosity on expected health through current social support and positive stereotypes. These findings support theory indicating that religiosity may confer social and potentially health benefits through increased social support (Grefe 2011; Merino 2014; Krause and Hayward 2014). The significant indirect effect of religiosity on expected health through increased positive stereotypes suggests that religion may increase the endorsement of positive stereotypes about aging. Contrary to hypotheses, religiosity was not associated with negative stereotypes about aging. As this is the first known study examining the associations between religiosity and stereotypes about aging, future research should replicate these findings and continue to examine mechanisms through which religion and religious contexts may impact positive and negative stereotypes about aging.

## Limitations and Future Directions

The results of the current study should be considered in light of several study limitations. First, although our sample was age-diverse, we only included participants between the ages of 18 and 59. It is likely that the associations examined in the current model may differ for older adults. Future research with larger samples should investigate potential differences between young, middle-aged, and older adults in the associations among expectations and perceptions of aging. Our sample was also composed exclusively of Colombians, making the generalizability of our findings to other Latin American countries unknown.

Of note, our study was the first known to examine the association between religiosity and expectations and perceptions of aging among Colombians. This study represents an important step forward as future research helps us understand the role of religiosity. However, our examination of religiosity was limited in two ways. First, we did not measure religious denomination, and although it is highly likely that the vast majority of our sample did self-identify as Christians, given the prevalence of Christianity in Colombia, it is possible that a small minority of our sample may have identified with other religions. Future research could explore whether the association between religiosity and perceptions and expectations of aging are similar or different by religion. Second, while our findings suggest potential mechanisms through which religiosity predicts expectations of aging, we were unable to determine why religiosity is associated with these mechanisms (higher current social support and more positive stereotypes about aging). Future research could explore the mediators and moderators of the relationship between religiosity and psychosocial outcomes. One promising area of future research may be the relationship between religiosity and aging anxiety. Does belief in a higher power reduce anxiety about aging and ultimately death? Is it the support of an additional community that drives these effects? Is it something about religion in general? Something specific to Christianity? Another promising area would be to examine the perceived importance that religion plays in one's life. If religion provides a sense of agency and importance, does this influence psychosocial outcomes?

Given that our study examined cross-sectional data, future longitudinal research could help provide a better understanding of the relationship between psychosocial predictors (e.g., stereotypes of aging) and psychosocial outcomes (e.g., aging anxiety and health). For example, longitudinal research could examine the temporal order of religiosity and psychosocial outcomes of interest.

Another relevant fruitful direction for future research is the impact of intergenerational contact on attitudes toward older adults (Christian et al. 2014; Levy 2016). An extensive body of research demonstrates that intergroup contact

is associated with reduced prejudice (Pettigrew and Tropp 2006). Some research indicates that contact, especially high-quality contact, with older adults is related to more positive attitudes toward older adults (Caspi 1984; Schwartz and Simmons 2001). Positive intergenerational contact seems to benefit older adults as well given that older adults with positive contact with younger adults have exhibited less stereotypical behavior and performed better on cognitive tasks than older adults without such contact (Abrams et al. 2006). More research is needed that examines how intergenerational contact could impact attitudes among younger persons (see Christian et al. 2014; Levy 2016 for discussion). Familial relationships, such as the grandparent–grandchild relationship, and relationships with older adults in religious contexts, where aging and older adults may be more positively portrayed, may represent promising mechanisms for improving attitudes toward older adults (Harwood et al. 2005; Grefe 2011). As an extension, such positive contact and exposure to positive portrayals of older adults and aging may also impact expectations of aging, aging anxiety, and stereotypes and perceptions of older adults (Levy 2016; Lytle and Levy 2017). We look forward to future research examining these possibilities.

## Conclusion

The current study advances the small literature on the associations among perceptions and expectations of aging in Colombia by demonstrating the associations among several important psychosocial variables. The findings draw attention to positive stereotypes about aging and social support predicting more positive expectations of aging and negative stereotypes about aging and aging anxiety predicting more negative expectations. Moreover, findings from this study highlight an understudied and possibly critical variable in the broader aging literature as well as the literature in Latin America: religiosity. These findings point to the potential buffering role that religiosity may play in these associations by increasing the endorsement of positive stereotypes about aging and decreasing aging anxiety.

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