

PERCEIVED RESOURCES AS A PREDICTOR OF SATISFACTION WITH FOOD-RELATED LIFE AMONG CHILEAN ELDERLY: AN APPROACH WITH GENERALIZED LINEAR MODELS

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Abstract: *Objective:* The main objective of this study is to show why perceived resources are a strong predictor of satisfaction with food-related life in Chilean older adults. *Design, sampling and participants:* A survey was conducted in rural and urban areas in 30 communes of the Maule Region with 785 participants over 60 years of age who live in their own homes. The Satisfaction with Food-related Life (SWFL) scale was used. Generalized linear models (GLM) were used for the regression analysis. *Results:* The results led to different considerations: First, older adults' perceived levels of resources are a good reflection of their actual levels of resources. Second, the individuals rated the sum of the perceived resources as 'highly important' to explain older adults' satisfaction with food-related life. Third, SWFL was predicted by satisfaction with economic situation, family importance, quantity of domestic household goods and a relative health indicator. Fourth, older adults who believe they have more resources compared to others are more satisfied with their food-related life. Finally, Poisson and binomial logistic models showed that the sum of perceived resources significantly increased the prediction of SWFL. *Conclusion:* The main conclusion is that perceived personal resources are a strong predictor of SWFL in Chilean older adults.

Key words: Older adults, family importance scale, health measures, poisson and binomial logistic model.

Introduction

The relationship between food and health is evident. Most people would agree that food is an essential part of living (1) and an essential component of quality of life (2). Traditionally, studies related to food have concentrated on the effects of nutrition on physical health, but few have looked at how diet affects subjective well-being (SWB) and satisfaction with life (SWL) (1, 3). This means that foods not only provided the energy resources needed to survive, but also contribute to hedonic well-being. Hausman in 2005 (4) suggests a duality of food consumption as food is both a utilitarian product to support the body and a hedonic product for the support and social construction of the soul. Sometimes foods are prepared with the expectation of being shared and enjoyed in the company of family or friends (5). Hargreaves et al. in 2002 (6) highlighted the emotional dimension of food associated with celebrations and social interaction. Other investigations have also shown that eating is an important source of happiness (7, 8, 9).

The idea behind this argument is that people have a set of food-related resources, and those with many assets are better able to fulfill their needs. An individual's resources can be seen as means that are at the individual's disposal, which can be used to work towards achieving the goals that make a person satisfied with his or her life (10). Some authors (11, 12) suggest that resources are material, social and personal characteristics that a person can call upon to achieve personal goals.

Some researchers have looked at the role of various resources in attaining life satisfaction (10, 11). Horstmann

et al. in 2012 (13) showed that satisfaction with income and perceived health are important predictors of SWL in Latvia and Sweden. In rural older Chinese adults SWL was significantly related to self-rated health, children's support, and being invited to dinner by neighbors (14). Other authors (15) argue that the impact of family resources on SWL is stronger for older people with fewer resources. Moreover, older adults consider contact with family members as very important for their SWB, in addition to having good health (16). Sok in 2010 (17) showed that the main factor that influences SWL among Korean older adults living with family was depression, perceived health status, self-esteem, monthly pocket money, and age. Social support and age are the major predictors of SWL in Angolan elderly (18). Yunong in 2012 (19) confirmed the importance of family relations in Chinese older people's lives. Oshio in 2012 (20) concluded that a larger number of friends and social activities enhance SWL for women but not for men among Japanese elderly. Several authors concluded that people in later life are more satisfied with their lives as they get older (15, 17, 21). For Chilean elderly SWL is associated with satisfaction with food (SWF) and better health and greater family interaction around meals (22). Finally, a high degree of SWL in a Mapuche group is associated with a larger quantity of goods in the home, higher education, and living with a partner (23).

Dean et al. in 2008 (10) investigated how actual resources, perceived levels of different types of resources and the objective relevance of these resources affect older people's satisfaction with food-related life (SWFL) in eight European countries. According to the authors the individuals who rated

high levels of different resources were also more satisfied with their SWFL. Furthermore, SWFL was predicted by income, health measures and living circumstances. However, the study also showed that perceived levels of other resources such as support of family and friends, food knowledge and storage facilities also added to the individuals' SWFL. Dean et al. in 2009 (24) indicated that the way older people perceived other resources is also important, such as their level of appetite, their food knowledge, and support from friends and neighbors.

Little evidence exists about the relation between food-related sources and SWFL and the impact of these variables on SWB indicators (1, 10, 22-25). Also, the results obtained from the literature are not reliable. Thus, using the data of Chilean urban and rural elderly population we expect to contribute with new evidence about the relation between food-related resources and SWFL. Also, considering the relation between health and food (2), social interaction and food (6), and happiness and food (7, 8), this study is intended to demonstrate that the SWFL is related to food-related resources, and health and family-related variables. In future studies, the SWFL may serve as a useful dependent variable to analyze how other objective indicators may be associated with that variable (25).

Previous studies (10, 11) have looked at how a balance between people's goals and their resources affect their SWB. In this study, we examine whether resources are important life satisfaction predictors for older adults who live in rural and urban areas. Thus we can investigate the relationships between food-related goals, personal resources and SWFL (10, 22). Given that social policy needs objective indicators (3), the main objective of this study is to show why perceived resources are a strong predictor of SWFL in Chilean older adults. Thus, we expect to provide insights for policy makers to improve their perceptions and understanding of the lives of Chilean elderly. To achieve the objective of the study the following hypotheses were tested:

Hypothesis 1: Older people's perceived levels of resources are involved in their actual levels of resources. This means that the perceived resources are a good example of actual resources.

Hypothesis 2: A bivariate level each resource considered individually is not significant in predicting the different SWB measures. However, the sum of these resources is significant.

Hypothesis 3: A multivariate level of the satisfaction with the economic situation, family importance, a relative health indicator, quantity of domestic household goods, and the total number of resources are important predictors for older people's satisfaction with food-related life.

Material and Methods

Design, sampling and participants

A survey was conducted in 30 communes of the Maule Region in central Chile. Stratified random sampling with proportional affixation within each commune was conducted, based on rate of rurality, gender, age and living circumstances.

The questionnaire was personally administered by trained interviewers during the months of May 2013 and January 2104. The participants signed informed consent statements before responding. 785 older adults of both genders (518 women, 263 men), aged 60-92 and registered in Senior Centers, were interviewed. The execution of the study was approved by the Ethics Committee of the University of Talca.

Measures

Satisfaction with Food-related Life (SWFL): Proposed and tested by Grunert et al. in 2007 (1), this consists of five-Likert items grouped in a single dimension. The interviewee had to answer how much he or she agrees with each of the five-items scoring from 1 (strongly disagree) to 6 (strongly agree).

Satisfaction with Life Scale (SWLS): Developed by Diener et al. in 1985 (26), this consists of five-Likert items grouped into a single factor to evaluate overall cognitive judgments about a person's own life. For this scale a five-item scoring from 1 (strongly disagree) to 6 (strongly agree) was used.

Family Importance (FI) scale: This was adapted by Burroughs and Rindfleisch in 2002 (27) from the full Traditional Family Values scale (28) and the Family Values scale (29). The interviewee had to answer how much he or she agrees with each of the five-items, on a six-point Likert-type scale scoring from 1 (strongly disagree) to 6 (strongly agree).

Health-Related Quality of Life Index (HRQoL): Developed by Hennessy et al. in 1994 (30), this is a multi-dimensional concept that includes domains related to physical, mental, emotional, and social functioning. The first item measures perceived health in general based on a personal assessment of current health or disease resistance. We asked the following question: 'How would you say your health is in general?' with a total score from 1 (very poor) to 5 (excellent). The second item refers to the physical health state during the past 30 days and the third item explores the status of recent mental health. We calculated the discrepancy between physical and mental health by subtracting item 3 from item 2 to obtain the 'relative health' indicator. The fourth item refers to limitations for common activities during the past 30 days.

Index of Independence in Activities of Daily Living (known as Katz ADL): Developed by Katz et al. in 1963 (31), this assesses six basic functions (bathing, dressing, toileting, transferring, continence and feeding). The participants were asked to rate their ability to perform these basic functions on a six-item scale, a four-point Likert-type from 1 (I cannot do it), 2 (It is very difficult to do), 3 (I can do it with little difficulty), and 4 (I can do it with no difficulty). A cumulative score for each respondent was obtained by summing the scores of the six items. The functional limitation score ranged from 6 to 24, with a higher score indicating fewer functional limitations.

The items used to represent each of these five constructs are shown in Table 1. We also used the 11 food-related goals (Table 2) and 22 resources (Table 3) proposed by Dean et al. in 2008 (10). We phrased the question on a resource level as

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Table 1
 Subjective Well-Being component score measures

SWB measures	Importance	α^a	KMO ^b	Percent of variance accounted
SWFL items ^c	Mean S.D.	0.86	0.80	56.27
Food and meals are very positive elements in my life	4.75 0.88			
I am very pleased with my food	4.58 1.00			
My life in relation to food and meals is close to ideal	4.51 1.00			
With regard to food the conditions of my life are excellent	4.51 0.95			
Food and meals give me a lot of satisfaction in daily life	4.74 0.88			
SWLS items ^c		0.84	0.84	55.01
In most ways my life is close to my ideal	4.32 1.05			
The conditions of my life are excellent	4.18 0.98			
I am satisfied with my life	4.67 1.03			
So far I have gotten the important things I want in life	4.59 1.00			
If I could live my life again, I would change almost nothing	4.20 1.34			
FI items ^c		0.86	0.85	58.84
I can't imagine having a fully satisfying life without my family	4.61 1.38			
The rewards of raising a family are more important to me than anything else	4.88 1.13			
The needs of other family members are more important than my own needs	4.60 1.18			
My really important relationships are in my home	4.95 1.11			
The family evening meal is one of the most important activities of my day	4.78 1.15			
SWES ^d	4.19 1.00			
Perceived health ^e	2.70 0.80			
Katz ADL ^f	17.32 2.01			

a. Cronbach's alpha; b. KMO index (Kaiser-Mayer-Olkin); c. Scale: 1-6, 1: strongly disagree; 6: strongly agree; d. Scale: 1-6, 1: extremely dissatisfied; 6: extremely satisfied; e. Scale: 1-5, 1: poor, 2: fair, 3: good, 4: very good, 5: excellent; f. Range: 4 to 24

follows: In order to achieve your food and meal-related goals, how important is (resource name) to you? The resources were rated on a five-point Likert-type scale scoring from 1 (strongly disagree) to 5 (strongly agree) and goals were rated on a five-point Likert-type scale scoring from 1 (not important) to 5 (extremely important).

We also asked about the satisfaction with the economic situation (SWES) using a one-item, six-point Likert-type scale scoring from 1 (extremely dissatisfied) to 6 (extremely satisfied). We recoded this scale into three categories: 1 (less than adequate), 2 (adequate) and 3 (more than adequate).

Other measures included are quantity of domestic household goods (QGoods), age, gender, living circumstances, children living at home, education, rurality, and socioeconomic level (SLevel). We crossed the QGoods and education variables to classify respondents according to their socioeconomic status: Level 1 (ABC1 is high and upper middle), 2 (C2 is middle-middle), 3 (C3 is middle-low), 4 (D is low), and 5 (E is very low).

Statistical analysis

A descriptive analysis was conducted to compute means with standard deviation (SD) for quantitative variables and frequencies (%) for qualitative variables (32). Several analyses were performed to investigate if the perceived levels of resources of older adults affect SWFL (10, 11). In order to check whether the available resources that an individual has is a predictor of SWFL, a correlation coefficient between each level of resources and their SWFL score were calculated. We added the score of the 22 perceived resources and calculated a new variable (range: 25-110), which we called 'sum of 22 resources'. The correlation between perceived mean level of resources and SWFL was computed and transformed into z-scores (mean=0; SD =1). These correlations were computed across the 22 resources for satisfaction with food-related life.

We estimated Poisson and binomial logistic models using generalized linear models (GLM) (33, 34). We measured the overdispersion (Ov) as the mean deviance [Ov=D ((β)/df)], where df is the degree of freedom and df=n-p, with p being

Table 2
 Mean and standard deviation of goal importance

Food-related goals	Importance	
	Mean	SD
Choose food products and dishes that you enjoy eating	3.31	0.90
Eat a healthy diet	3.63	0.83
Vary your menu and have a wide range of foods and dishes	3.34	0.90
Eat your daily meals in nice surroundings	3.63	0.84
Arrange shopping and preparation of meals so that you do not need help from others	3.43	1.00
Keep your expenditures on food as low as possible	3.71	1.03
Eat your meals in the company of other people	3.59	0.94
Maintain the cultural traditions of your country or region in relation to food and meals	3.29	1.03
Control your weight through your choice of food	3.44	1.00
Be able to cook meals for others	3.14	1.16
Choose food products and dishes that are quick and easy to prepare	3.04	1.11

Scale: 1–5; 1: low importance; 5: high importance.

the number of parameters. To evaluate the goodness-of-fit of the models, different statistical tests were applied: adjusted-R², Pearson χ^2 , and likelihood-ratio χ^2 . Binomial logistic regression analysis was used to determine the odds of having the highest satisfaction with food associated with the sum of 22 resources, controlling for SWES, family importance, relative health, and QGoods. The highest satisfaction was defined as an SWFL above the cutoff point of the fifth decile, or the median (SWFL \geq 24). The global predictive power for the binomial model was evaluated using a Receiver Operating Characteristic (ROC) curve analysis. The sensitivity was calculated as the ratio of true positives to true positives plus false negatives; the specificity was calculated as the ratio of true negatives to true negatives plus false positives (32). The reference variable was the SWFL, which ranges from 5 to 30; the cutoff point of 24 selected to differentiate satisfied and non-satisfied with food-related life was proposed by Lobos et al. (35) for this purpose. Finally, $p < 0.01$ was considered significant. The data were analyzed using Statistical Package for Social Science (SPSS for Windows, v. 22).

Results

A principal component analysis (PCA) of the five items measuring SWFL revealed one factor accounting for 56% of the variance. A composite score was computed for each individual using the mean value of all five items (Cronbach's $\alpha = 0.86$). With respect to the SWLS, the PCA confirms the existence of one factor for all items with 55% explained variance. Evidence of internal consistency for SWLS is strong (Cronbach's $\alpha = 0.84$). Finally the FI scale revealed one factor accounting for 59% of the variance and presented strong evidence of internal consistency (Cronbach's $\alpha = 0.86$). See Table 1 for the mean

values of the items used. The scales showed their reliability ($\alpha > 0.7$) and validity (Kaiser-Mayer-Olkin –KMO index > 0.5) in all cases.

As for personal goals, Chilean older adults rated 'keep your expenditures on food as low as possible' as their most important goal and 'choosing food products and dishes that are quick and easy to prepare' as their least important goal (Table 2). The means and standard deviations for each of the 22 resources and their goal relevance are shown in Table 3. Respondents viewed themselves as well resources when it comes to being in good health, good dental health, and having adequate income. Also, they believe they have access to food at low prices, can get around on foot and have family members willing to help them when needed. However, they viewed themselves as being low resourced in terms of access to new and different types of food products and organic food (Table 3).

Hypothesis 1

Correlations between actual and perceived resources showed that living circumstances are associated with SWES: those who live with a partner are more satisfied with their actual economic situation than those who live alone. Rurality was also found to be associated with SWES: those who live in rural areas are more satisfied with their actual economic situation than those who live in urban areas. People with better perceived health declared fewer emotionally and physically unhealthy days. In addition, functionality correlated highly with perceived health and highly negatively with physical health, such that those who were in better physical health were independent and vice versa. Socioeconomic level was also found to be negatively associated with SWES: those who belong to a lower socioeconomic level are less satisfied with their economic situation (Table 4).

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Table 3
 Mean and standard deviation of resources and the correlation with Subjective Well-Being (SWB) measures

Resources	Level of agreement ^a		Pearson correlation coefficient ^b			
	Mean	S.D.	SWFL	SWLS	FI	Perceived health
Being able to taste and smell well	4.16	0.75	0.20**	0.14**	0.14**	-0.03
Access to food that is quick and easy to prepare	3.72	0.89	0.07	0.06	-0.00	0.05
Access to convenient means of public or private transportation	4.03	0.75	0.11**	0.05	0.16**	-0.09**
Access to good food service providers, for example a day center or meals on wheels	4.02	0.66	0.12**	0.05	0.15**	-0.02
Access to high quality food products and brands	3.57	0.94	0.12**	0.13**	0.09*	0.06
Access to new and different types of food products	3.41	0.93	-0.02	0.05	-0.01	0.10**
Access to organic food	3.45	0.94	0.13**	0.16**	0.10**	0.05
A good general knowledge about food and nutrition	3.90	0.82	0.21**	0.20**	0.21**	0.01
Being able to receive support from authorities or private organizations	3.83	0.90	0.17**	0.09*	0.11**	-0.06
A good appetite	4.06	0.82	0.14**	0.04	0.14**	-0.06
Good cooking skills	4.03	0.9	0.20**	0.16**	0.20**	-0.04
Good dental health	4.28	0.86	0.29**	0.28**	0.24**	-0.06
Good food storage facilities, for example a freezer, refrigerator or cupboards	4.12	0.70	0.33**	0.28**	0.25**	-0.12**
Being in good health	4.48	0.66	0.26**	0.16**	0.23**	-0.09*
Adequate income	4.42	0.67	0.14**	0.09*	0.18**	-0.07*
Appropriate kitchen appliances and equipment to make cooking easier	4.10	0.68	0.21**	0.17**	0.21**	-0.11**
Access to food at low prices	4.22	0.83	0.04	-0.05	0.11**	-0.02
Being able to get around on foot	4.21	0.75	0.20**	0.06	0.16**	-0.11**
Sharing your meals with other people (including your partner or spouse)	4.03	0.79	0.24**	0.27**	0.28**	-0.05
A short distance to your normal food shops	4.07	0.72	0.13**	0.03	0.11**	-0.11**
Having family members who will help you when needed	4.19	0.71	0.19**	0.16**	0.28**	-0.13**
Having a neighbor or close friend who will help you when needed	4.05	0.78	0.18**	0.15**	0.15**	-0.12**
Sum of resources	88.12	8.91	0.31**	0.18**	0.30**	-0.09**

a. Level was measured on a five-point scale (1: strongly disagree; 5: strongly agree) b. Significance at *p<0.05 and **p<0.01, two-tailed

Hypothesis 2

Table 3 shows the correlations between each resource and different SWB measures. In most cases, resources such as a good appetite and access to food at low prices are highly correlated with SWFL. Also, resources such as access to organic food and good cooking skills are highly correlated with SWLS and FI. In some cases, resources showed modest correlations with SWB measures. In other cases, no significant correlation were observed between resources and SWB measures such as access to food that is quick and easy to prepare and perceived health. The correlation between the total of all the resources and SWB measures are shown at the bottom of Table 3. All SWB measures, however, showed the strongest correlation with the combined resources. For example, the sum of all the resources are most highly correlated with the SWFL, SWLS, FI, and perceived health. Thus, on a bivariate level we should see higher levels of SWFL and SWLS in elderly people with a higher sum of perceived resources. The mean within subject correlation was 0.17, where 95% of the

correlations were positive and only 5% were negative. Also, the correlation between the sum of the 22 resources and the SWFL was positive and significant.

Hypothesis 3

Table 4 presents the definitions and descriptive statistics for the variables included in the models. The first step in the Poisson model (Table 5 and 6) to explain older adults' SWFL by their actual resources revealed significant effects for SWES, family importance, relative health, and QGoods. In the logistic regression, the odd ratios and 95% confidence intervals (CI) are presented for SWES, family importance, relative health, and QGoods. The area under the ROC curve was 73%. The sensitivity was 95.4 and the specificity was 24.7%. This implies that those who assigned greater importance to family are in good physical health relative to their mental health, have a more than adequate perceived SWES and have a higher QGoods, are more satisfied with their food-related life than those who have an adequate or less than adequate perceived SWES, assigned

Table 4

Definitions and descriptive statistics for some variables used in the regression models of Chilean older adults^a

Variable	Definition	Mean or %	SD
Age	In years (range: 60–92)	71.33	6.45
Male	Dummy variable (1 = male, 0 = female)	33.7	–
Living alone	Dummy variable (1 = yes, 0 = no)	44.7	–
Children	Number (range: 0–7)	0.46	0.87
Education	Education attainment in 8 levels		
	1 = no formal education	7.9	
	2 = primary incomplete	35.2	
	3 = primary complete	19.2	
	4 = secondary incomplete	12.7	
	5 = secondary complete	14.1	
	6 = technical incomplete	1.9	
	7 = technical complete or college incomplete	4.7	
	8 = college or more	4.1	
Rurality	Dummy variable (1 = rural, 0 = urban)	49.6	–
SLevel			
ABC1	1 = high and upper middle	5.7	–
C2	2 = middle-middle	12.2	–
C3	3 = middle-low	27.6	–
D	4 = low	47.6	–
E	5 = very low	6.9	–
SWES	Economic situation attainment in 6 levels		
Less than adequate	(1 = extremely dissatisfied, 2 = somewhat dissatisfied)	5.38	–
Adequate	(3 = slightly dissatisfied, 4 = slightly satisfied)	55.83	–
More than adequate	(5 = somewhat satisfied, 6 = extremely satisfied)	38.80	–
Family importance	Number (range: 6–36) Family are 6 items attainment in 6 levels (1 = strongly disagree, ..., 6 = strongly agree)	26.64	4.31
Perceived health	Perceived health attainment in 5 levels		
	1 = poor	3.7	–
	2 = fair	38.4	–
	3 = good	43.6	–
	4 = very good	12.4	–
	5 = excellent	1.8	–
Emotionally unhealthy days	Number (range: 0 to +30)	2.87	7.12
Physically unhealthy days	Number (range: 0 to +30)	4.22	8.19
Relative health	Number (range: –30 to +30)	1.35	8.64
Katz ADL(functionality)	Number (range: 6–24)	17.32	2.01
QGoods	Number (range: 0–10)	6.58	2.00
Sum of 22 resources	Number (range: 22–110) Resources are 22 items attainment in 5 levels (1 = strongly disagree, ..., 5 = strongly agree)	88.12	8.91
N		785	–

a. Some correlations among study variables: Living alone with SWES ($r=0.15, p<0.01$), rurality with SWES ($r=0.16, p<0.01$), perceived health with emotionally unhealthy days ($r=-0.19, p<0.01$), perceived health with physically unhealthy days ($r=-0.31, p<0.01$), functionality with perceived health ($r=0.13, p<0.01$), functionality with physical health ($r=-0.22, p<0.01$), socioeconomic level with SWES ($r=-0.09, p<0.05$).

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Table 5
 Regression coefficients from linear, Poisson and binomial logistic models

	Poisson		Binomial logistic		
	β^a	S.D.	β^a	SD	OR (95%CI) ^b
Step 1					
Constant	15.91 ***	1.19	-2.59 ***	0.64	-
SWES					
1: less than adequate	-2.61***	0.79	-1.39***	0.41	0.25 (0.11-0.54)
2: adequate	-2.05***	0.37	-1.44***	0.23	0.24 (0.15-0.36)
3: more than adequate	Ref.	.	Ref.	.	1.00
Family importance	0.25***	0.40	0.14***	0.22	1.15 (1.10-1.20)
Relative health	0.06**	0.20	0.03**	0.01	1.03 (1.01-1.05)
QGoods	0.25 ***	0.09	0.15 ***	0.05	1.16 (1.06-1.27)
Step 2					
Constant	9.05 ***	1.87	-5.02***	1.02	-
SWES					
1: less than adequate	-2.65***	0.79	-1.42 ***	0.41	0.24 (0.11-0.54)
2: adequate	-1.92 ***	0.37	-1.40 ***	0.23	0.25 (0.16-0.39)
3: more than adequate	Ref.	.	Ref.	.	1.00
Family importance	0.20***	0.04	0.13 ***	0.02	1.14 (1.09-1.19)
Relative health	0.06***	0.02	0.03 ***	0.01	1.03 (1.01-1.06)
QGoods	0.22**	0.09	0.13 ***	0.05	1.14 (1.04-1.26)
Sum of resources	0.09***	0.02	0.03 ***	0.01	1.03 (1.01-1.06)

a. Significant variables at **p<0.05, at ***p<0.01 based on Wald statistics; b. OR: odds ratio, 95%CI: 95% confidence interval.

less importance to family, are in poor physical health relative to their mental health and have a lower QGoods.

In the second step the Poisson model of SWFL was extended to the sum of perceived resources. It revealed significant independent effects for SWES, family importance, relative health, QGoods, and the sum of perceived resources. The increase in explained variance for the Poisson model from the first to the second step revealed a significant increase (4%). This showed that in the Poisson model the sum of perceived resources significantly increased the prediction of SWFL. In the logistic regression the odd ratios and 95% CI were presented for SWES, family importance, relative health, QGoods, and the sum of perceived resources. Then the area under the ROC curve was 74%, the sensitivity was 94.7%, and the specificity was 33%. The increase in explained variance for the logistic model from the first to second stage revealed it was significant for SWFL (1%). In both models no major problems of overdispersion were observed.

Furthermore, whether or not older people are male or female, live alone or together, live with or without children or grandchildren at home, have higher or lower education, live in rural or urban areas, have a high or low socioeconomic status, or are more or less independent does not appear to affect their satisfaction with food-related quality of life.

Discussion

With respect to the first hypothesis, our results show that older people’s perceived levels of resources are a good reflection of their actual levels of resources, as suggested by the literature (10). Results showed that the more resources the individual has, the higher the SWFL experienced. One can also infer that among those most satisfied with their food-related life you can find a greater number of perceived resources. This implies that older adults who believed they had relatively more resources were more satisfied with their food-related life. Those who have relatively fewer resources have lower satisfaction with their food-related life. Therefore, regarding the second hypothesis, as concluded by Hobfoll in 2001 (36), our results also show that there is a strong relationship between SWFL and total resources; however, when considering the resources individually, in many cases the relations were quite modest. This inference is also valid for all other welfare measures included in the analysis (i.e., the relation between combined resources and SWLS, FI and perceived health). It is likely that the large number of resources involved with low covariance between them makes each resource individually insignificant for predicting the level of welfare. However, the sum of the resources does contribute to the explanation of a significant

Table 6
 Selected goodness-of-fit statistics for model based on Poisson and binomial logistic distributions

	Poisson			Binomial			
	df	Value	Value/df	df	Value	Value/df	
Step 1							
Deviance full model	758	406.16	0.54	698	702.13	1.01	
Deviance null model	763	512.54	0.67	703	834.23	1.19	
adjusted-R ^{2a}	-	0.21	-	-	0.16	-	
Pearson χ^2	758	391.64	0.52	698	729.82	1.05	
Likelihood-ratio χ^{2b}	5	106.38***	-	5	132.10***	-	
ROC analysis	-	-	-	Area	S.D.	Sig.	Upper and lower limit
				0.73	0.03	p<0.01	[0.67-0.79]
Step 2							
Deviance full model	757	384.21	0.51	697	692.09	0.99	
Deviance null model	763	512.54	0.67	703	834.23	1.19	
adjusted-R ^{2a}	-	0.25	-	-	0.17	-	
Pearson χ^2	757	369.01	0.49	697	717.50	1.03	
Likelihood-ratio χ^{2b}	6	128.33***	-	6	142.14***	-	
ROC analysis	-	-	-	Area	S.D.	Sig.	Upper and lower limit
				0.74	0.03	p<0.01	[0.69-0.80]

Note: N=785. The models include the explanatory variable shown in Table 4; a. Significant at ***p<0.01; b. adjusted-R²=(Deviance_null-Deviance_full)/Deviance_null

proportion of the variance in SWB. Therefore, we agree with the literature (11) in that ‘the resources taken together are moderately strong predictors of SWB’.

To prove the third hypothesis, we show that older adults who believed they had relatively more resources are more satisfied with their food-related life, as Dean et al. suggested in 2008 (10). Finally, the fourth hypothesis allowed us to show that indeed the most important predictors of older people’s SWFL were the SWES, family importance, a relative health indicator, quantity of domestic household goods, and total resources. This also showed that in the binomial logistic model the sum of perceived resources significantly increased the prediction of SWFL more than the actual resources do.

In general, the results show that the main goals of Chilean urban older adults are to keep their expenditures on food as low as possible, in addition to eating a healthy diet, eating their daily meals in nice surroundings, and eating their meals in the company of other people. The goal related to ‘taking care of spending’ of Chilean older adults differs significantly from the results of Dean et al. in 2008 (10). A relevant factor to explain this discrepancy is the lower standard of living in Chile compared to any of the eight European countries included in that work. According to FMI figures for 2014, the average gross domestic product (GDP) per capita in the eight countries is 1.7 times the GDP per capita in Chile, which imposes a hard budget constraint on food consumption for elderly Chileans. To achieve these main goals mentioned above, older adults

consider it relevant to be in good health, have an adequate income and good dental health. They also find it relevant to have access to food at low prices, be able to get around on foot, have family members to help them when needed, be able to taste and smell well, have good food storage facilities, appropriate kitchen appliances and equipment, a short distance to their normal food shops and have a neighbor or close friend who will help them when they need it. This shows not only that for this group of people the perceived resources are related to functional mobility, health and income, but also that family-related aspects, the enjoyment of food and social contacts are important. Therefore, the set of older adults’ self-perceived available resources may affect their eating habits, as suggested in the literature (37, 38).

The results of Dean et al. in 2008 (10) differ from the results of this study in that the SWFL was predicted by income, health measures and living circumstances. In this study, SWFL was predicted by SWES, family importance, a relative health indicator and quantity of domestic household goods. But similarly to Dean et al. in 2008 (10), Chilean older adults also considered that other resources such as support of family and friends, food knowledge, storage facilities added to the individual’s satisfaction with food-related life. In addition, for Chilean older adults having access to food at low prices and being able to get around on foot seem to be relevant. On the other hand, one of the main similarities between the study by Dean et al. in 2008 (10) and our study is that the participant’s

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level of resources was measured as perceived by the participant him or herself. The relationship between the participant's perceived level on some of the resources and actual resources showed that they were highly correlated, thereby demonstrating that people's perception was closely linked to their actual living circumstances. Although in the study by Diener and Fujita in 1995 (11) the individual's level of resources was assessed by people close to the participants, the conclusion was exactly the same.

In accordance with other studies (1, 22) the results of this study confirm the relationship between food and SWB. Eating in pleasant surroundings and in the company of other people clearly reflects the contribution of foods to hedonic well-being and social construction, as suggested by several authors (4-6, 22). We can also conclude that the relationship between resources and perceived level of SWB is indirect for three reasons. First, the resource affects satisfaction with food-related life, as also reported by the literature (1, 10, 24). Second, in accordance with previous studies (1, 10, 22-25), SWFL is a strong predictor of SWL. Third, SWL is the SWB's cognitive component, which is influenced by several predictors related to various domains of life of older adults, as various authors have shown (13-20).

Finally, the findings in this work can be an input for policymakers to design and implement policies that contribute effectively to increasing urban older adults' satisfaction with food-related quality of life. For example, to improve the movement of seniors within cities the condition of streets and the state of the sidewalks can be improved, and barriers on public roads can be reduced. This would shorten the time needed to look for products, the access to better food prices, and it would increase the variety of products they can buy. It is also important to strengthen policies aimed at maintaining the family with older adults. For example, policies for families to strengthen elderly care systems, including social care and health care. Additionally, campaigns could be developed to provide information on the risks and benefits of eating certain foods, in addition to encouraging the use of good food storage facilities such as freezers, refrigerators or cupboards. The latter could be done through conditional transfers related to relative health, where every adult receives a redeemable coupon in exchange for check-up tests of physical and emotional health performed in a public office. The conditional transfer mechanism would also be useful for improving the quantity of domestic household goods. A transfer, even in coupons, contributes not only to improving SWES, but also increases the real income of this demographic group. Therefore, all these measures would improve the SWFL of Chilean urban older adults.

This study has some methodological limitations related to the use of cross-sectional data, in addition to the bias and representativeness of the sample. This suggests that the results must be interpreted with caution. First, since this study only reports information on the cross-sectional patterns in the different dimensions of SWB of Chilean older adults, we cannot

make deductions with respect to trends in recent years. Second, in this study independent older adults were interviewed; they were not institutionalized and were registered in a Senior Center. Therefore, the sample could have a significant selection bias. Third, the selected sample is a population that represents approximately one-fifth of the total population of older adults, which suggests that the methodology should be validated with a larger sample.

Conclusion

The main conclusion is that perceived personal resources are a strong predictor of SWFL in Chilean older adults. There are different reasons to explain why this is so. First, in this study we show that perceived resources are a good reflection of the current level of resources; this means that the subjective measurement is consistent with the real resources available. Secondly, although the perceived resources are not as relevant when considered individually, the total resources are strongly associated with SWFL. Third, the total resources, together with the availability of goods in the home and the health and family-related factors are powerful predictors of SWFL. This implies that the factors mentioned contribute to SWB in Chilean older adults. This finding can seem very simple and evident, but it has remarkable implications for the design of public policy. This means that the conditional transfer of resources, the improvement in health insurance and the policies that contribute to making a "better family" are important for a better quality of life for the elderly.

Conflict of interest: GL, BS, KGG and CA have no conflicts of interest to declare.

Ethical Standards: The interviews in this study comply with the current laws of the country in which they were performed.

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