Revista Latinoamericana de Psicología

www.elsevier.es/rlp

ORIGINAL ARTICLE

Psychometric properties of the Life Orientation Test (LOT-R) and its relationship with psychological well-being and academic progress in college students

Josep Gustems-Carnicer [a],*, **Caterina Calderón** [b], **Maria Forn Santacana** [b]

[a] *Department of Social, Music, Corporal and Visual Didactics, Faculty of Education, University of Barcelona, Passeig de la Vall d'Hebron, 171, 08035 Barcelona, Spain*
[b] *Department of Personality, Assessment and Psychological Treatment, Faculty of Psychology, University of Barcelona, Passeig de la Vall d'Hebron, 171, 08035 Barcelona, Spain*

Abstract The aim of this study is to analyze the dimensionality of the Spanish version of the Revised Life Orientation Test (LOT-R), to examine the relationship between psychological well-being and dispositional optimism/pessimism in a sample of college students ($n = 291$), as well as to consider the effect of dispositional optimism/pessimism on academic progress. The results indicated that the properties of the Spanish version of the LOT-R ($\alpha = .72$) were very similar to the original. The questionnaire clearly presented two partially independent factors, and the items assessing optimism demonstrated greater discriminant validity than the items assessing pessimism. Optimism was positively linked to psychological well-being and negatively related to psychological-distress. In the male students, a certain degree of preoccupation about academic results was linked to progress in studies, while excessive worry about academic progress could obstruct the successful completion of studies in the female students. These results suggest that the LOT-R can be used as a reliable and valid tool for the analysis of optimism and its positive effects on health and academic progress.

* Corresponding author.
  E-mail address: jgustems@ub.edu (J. Gustems-Carnicer).

Propiedades psicométricas del Life Orientation Test (LOT-R) y su relación con el bienestar psicológico y el progreso académico en estudiantes universitarios

Resumen   Este estudio pretende analizar la dimensionalidad de la versión española del *Revised Life Orientation Test*, para examinar la relación entre el bienestar psicológico y el optimismo/pesimismo disposicional en una muestra de estudiantes universitarios (*n* = 291) y analizar la repercusión del optimismo/pesimismo disposicional en el progreso académico. Los resultados indican que las propiedades de la versión española del *Revised Life Orientation Test* (α = 0.72) son muy similares a los de la versión original. El test presenta una estructura clara con dos factores parcialmente independientes, los ítems del factor optimismo tienen un poder discriminatorio mayor que los del factor de pesimismo. El optimismo está relacionado positivamente con el bienestar psicológico y negativamente con el malestar psicológico. En hombres, cierto grado de preocupación por los resultados académicos estaría relacionado con el progreso académico en los estudios, mientras que en mujeres, una excesiva preocupación académica podría ser perjudicial para finalizar con éxito los estudios. Estos resultados sugieren que el *Revised Life Orientation Test* puede ser un instrumento fiable y válido para analizar el optimismo y su relación con la salud y progreso académico.

In recent years, educational psychologists have become increasingly interested in the theoretical conceptualization of such terms as optimism, well-being or positive thinking and in the use of these as constructs to predict college students' academic performance (Chemers, Hu, & Garcia, 2001; Haugen, Ommundsen, & Lund, 2004). There has been particular interest in the notion of dispositional optimism, which refers to the students' belief that the future holds more successes than failures (Scheier, Carver, & Bridges, 2001; Throndsen, 2010), and their expectation that they can control the results of their actions and achieve positive future outcomes. Dispositional optimism also involves a component of self-efficacy (Gillham, Shatte, Reivich, & Seligman, 2001).

Dispositional optimism has been closely linked to positive affectivity, well-being and self-confidence (Marshall, Wortman, Kusulas, Hervig, & Vickers, 1992), while pessimism has been linked to the presence of negative affectivity, physical symptoms (Chang, 1998) and to pessimistic attributions of both negative and positive accounts in undergraduate students (Ahrens & Haaga, 1993) and at advanced teacher students (Haugen & Lund, 2002). Many studies also indicate that optimism has a significant effect on performance and adjustment, both directly on academic performance and indirectly through expectations and coping perceptions on classroom performance, overall satisfaction and commitment to remain in university (Chemers et al., 2001). Optimistic strategy is related to better processing of ideas in databases than pessimistic strategy (Koivusaari, 2006).

This study uses the Life Orientation Test (LOT, Scheier & Carver, 1985), developed by Scheier and Carver and revised in 1994 as the Revised Life Orientation Test – LOT-R (Scheier, Carver, & Bridges, 1994). These authors use the model of the self-regulation of behavior to conceptualize optimism and they suggest that when difficulties arise, favorable expectations increase people's efforts to attain their objectives, while unfavorable expectations reduce these efforts. In this model, optimism and pessimism are considered as generalized outcome expectancies about the things that happen to a person during their life (Scheier & Carver, 1985). Since its beginnings, the evidence has demonstrated the LOT's psychometric properties and the questionnaire is currently one of the most widely used instruments for assessing dispositional optimism.

In line with the theory proposed by Scheier and Carver, the optimism–pessimism construct is unidimensional and bipolar, i.e. a single trait with two poles. However, practically all factor analyses of the LOT-R (including Scheier & Carver, 1985) obtain two factors with one formed by items assessing optimism and the other formed by items assessing pessimism (Robinson-Whelen, Kim, MacCallum, & Kiecolt-Glaser, 1997). This could be due to two reasons: (a) the item format produces a bias (the wording of items assessing optimism is positive while the wording of items assessing pessimism is negative); or (b) the scale measures two partially independent constructs. This is relevant for the significant link between the scale and variables like depression (Haugen & Lund, 2002), self-regulation and/or psychological well-being (Haugen et al., 2004), social support (Hatchett & Park, 2004) and performance and academic adjustment (Chemers et al., 2001).

Gender-specific difference is a central and also controversial subject in research on psychology and is studied in a variety of areas, from cognitive style and prosocial behavior to psychological well-being and optimism (Chrisler & McCreary, 2010; Fine, 2010). In a sample of young university students from Santiago of Chile, they did not find significant differences between men and women in dispositional optimism (Vera-Villarroel, Córdova-Rubio, & Celis-Atenas, 2009). Women generally score higher in the dimensions Positive relationships with others, Purpose in life, and Autonomy (Ryff, Keyes, & Hughes, 2003), and also adjust better than

men to academic environments (Boman & Yates, 2001). On the other hand, men score higher in Self-acceptance and Self-confidence (Visani, Albieri, Offidani, Ottolini, Tomba, & Ruini 2011). Optimism was negatively related to anxiety, stress and depression (Brydon, Walker, Wawrzyniak, Chart, & Steptoc, 2009; Vera-Villarroel, Zych, Celis-Atenas, Córdova-Rubio, & Buela-Casal, 2011), while it has a positive interaction in the opposite direction with factors such as life satisfaction and self-esteem (Caprara et al., 2009) and psychological wellbeing (Lyubomirsky, 2008). The dispositional optimism has been researched widely in different cultures, proving its utility as a related variable and as a predictor of important psychological variables and states of health (Pavez, Mena, & Vera-Villarroel, 2012). Another area of study that requires further attention is gender-specific differences in dispositional optimism/pessimism in college students' academic progress.

This study aimed to analyze the dimensionality of the Revised Life Orientation Test (LOT-R), the predictive capacity of psychological well-being in college students and the influence of the optimism–pessimism construct in academic progress. First, the descriptive data of the LOT-R were analyzed and the dimensionality of this tool was reviewed in the reference group. Secondly, the relationship between psychological well-being and dispositional optimism/pessimism was analyzed using two scales: (a) the Brief Symptom Inventory-18 (BSI-18), we expected to see a negative relation with optimism and a positive relation with pessimism; and (b) Ryff's Psychological Well-Being (PWB) Scales, and we expected to see a positive relation with optimism and a negative relation with pessimism. Third, to consider the effect of dispositional optimism/pessimism on academic progress. We expected the pessimism to explain part of the variance in student staying power in the completion of studies.

Method

Participants

Participants were 357 undergraduate college students at a Spanish university. These students were enrolled in a bachelor's degree course in early childhood education, or in primary education. Students were approached in their classroom. Two hundred ninety-one students (81.5%) completed questionnaires. The mean age of the university sample was 23 years ($SD = 4.9$, range 18–43 yrs.). There were 88.3% women and 11.7% men in the sample. The percentage of women studying early childhood education or primary education is 87.5% at the University of Barcelona; there are no significant differences with our sample ($t = 1.455$ and $p = .147$). With regard to the grade, there were 56.7% ($n = 165$) students of Early Childhood Education and 42.6% ($n = 124$) were students of Primary Education, the 0.7% ($n = 2$) did not provide their Bachelor's degree. The large majority was born in Spain (95.2%), 1.4% being Central American, South-American (0.7%), and African (0.3%); 2.4% of the respondents did not provide their country of birth (see Table 1).

Based on Hollingshead four factor index (Hollingshead, 1975), the participants' families corresponded to the following categories: 13.7% low Familiar Socioeconomic-Status

Table 1 Descriptive Statistics of Relevant Variables ($n = 291$).

Variables	n (%)
Age, M (SD)	23.3 (4.9)
Gender	
Girls n (%)	257 (88.3)
Academic year, n (%)	
2nd year	83 (28.5)
3rd year	150 (51.5)
4th year	56 (19.4)
Not provide information	2 (.7)
Bachelor degree, n (%)	
Early childhood education	165 (56.7)
Primary education	124 (42.6)
Not provide information	2 (.7)
Country of birth	
Spain	277 (95.2)
Central American	4 (1.4)
South-American	2 (.7)
African	1 (.3)
Not provide information	7 (2.4)
FSS family, n (%)	
FSS low	40 (13.7)
FSS low-medium	51 (17.5)
FSSE medium	54 (18.6)
FSS medium-high	97 (33.3)
FSS high	37 (12.7)
Not provide information	12 (4.1)
FSS family, M (SD)	37.4 (14.9)

(FSS), 17.5% FSS low-medium, 18.6% FSS medium, 33.3% FSS medium-high, 12.7% FSS high, and the 4.1% did not provide information.

Measures

The following questionnaires were administered:

The socio-demographic data sheet. It provided information about several characteristics of the group: age, gender, year of study, degree being studied, country of birth, and parental educational level and occupational field. These last two factors were introduced in the Hollingshead Occupational Scale (Hollingshead, 1975) to obtain family socioeconomic status. The students specified their high school grade-point average and the number of academic credits they had successfully completed. This last variable was considered as an indicator of academic progress.

The Revised Life Orientation Test – LOT-R (Scheier et al., 1994) in its Spanish version (Otero, Luengo, Romero, Gómez-Fraguela, & Castro, 1998). The LOT-R consists of Optimism and Pessimism scales, with 10 items (three items assess optimism, three assess pessimism, and four of them are fillers). The respondents indicated the extent to which they agreed with each item on a 5-point Likert scale that ranged from *strongly agree* to *strongly disagree*. The internal consistency (Cronbach's alpha) ranged between .74 and .78 (Schou, Ekeberg, Ruland, Sandvik, & Karesen, 2004).

Brief Symptom Inventory. The BSI-18 (Derogatis, 2001) was used to measure participants' psychological distress (PD). This inventory includes 18 symptoms to assess the degree of distress on a Likert-type five-point scale ranging from 1 (*total absence of symptom*) to 5 (*full presence of symptom*). The scale provides three groups of symptoms: somatization disorder, depression, and anxiety. A global severity index (GSI) and a positive symptom distress index (PSDI) were calculated. The test-retest reliability ranged from .78 to .90. Cronbach's alpha ranged from .81 to .90 (Derogatis, 2001). In the present research, Cronbach's alpha for BSI-18 were: somatization ($\alpha = .663$), depression ($\alpha = .821$) and anxiety ($\alpha = .736$).

Ryff Scales of Psychological Well-Being. The scale PWB (Ryff, 1989) is a self-report scale designed to measure psychological well-being. The instrument consists of six subscales: Self-acceptance, Positive-relationships with others, Personal-growth, Purpose in life, Autonomy, and Environmental-mastery. Each subscale consists of 14 items divided approximately equally between positive and negative items. The self-acceptance dimension assesses positive attitudes held toward the self. The positive-relationships with others dimension assesses the ability to love, trust, and establish deep relationships with others. The personal growth dimension measures one's needs to actualize and realize one's potentials. The purpose in life item seeks to measure one's sense of directedness and goals. Autonomy assesses self-determination, independence, and an internal locus of control. Finally, the environmental mastery measures one's ability to manipulate and control complex environments. Participants respond on a 6-point Likert scale that ranges from *strongly disagree* (1) to *strongly agree* (6). Certain items are reverse coded. The total score is the sum of the 84 items. Ryff and Keyes (1995) reported the following internal consistency reliability coefficients ranged from .81 to .85. In the present research, Cronbach's alpha for PWB were: self-acceptance ($\alpha = .848$), positive-relationships ($\alpha = .809$), personal-growth ($\alpha = .778$), purpose in life ($\alpha = .846$), autonomy ($\alpha = .751$), and environmental-mastery ($\alpha = .731$).

Procedures

This study was approved by Ethics Committee of the University of Barcelona (Spain) and was conducted in line with the guidelines of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1978). Subsequent to a full explanation of the study procedures to students in their classrooms, students were invited to participate. A consent form to be signed by students was requested the day of the data collection. The participation of study was voluntary and anonymous. Students that declined to participate did not differ in age, socioeconomic status, or grade level from those who did participate.

The questionnaires were applied collectively in groups of 15–30 students over an 1-hour session in their classrooms. Students were informed that there were no good or bad answers, and that the answer should be chosen according to their own experiences. Special attention was paid in order to ensure privacy and confidentiality of the data, and to avoid random answers. Two members of the research team were present in the classroom to clarify doubts and help if necessary.

Data analyses

Descriptive analyses were conducted for each of the LOT-R items and their discriminatory power was calculated by item-total correlation which measures the relationship between a given item and the rest of the scale. For empirical evidence of the internal structure of the scale an exploratory factor analysis was conducted using the principal axis technique and Oblimin rotation. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was used to test whether the application was relevant to factor analysis. Two factorial solutions were confirmed: unidimensionality and bifactoriality. The loadings of the items to the factors were established at .30. The two-factor solution was accepted. Reliability analysis was conducted based on the analysis of internal consistency by calculating Cronbach's alpha. The minimum acceptable value for Cronbach's alpha coefficient is .60 and the expected maximum value is .90. No redundancy or duplication of items are thought to occur above this value. Criterion validity was examined using non-parametric Kendall's tau correlations between LOT-R and BSI (both total and scales scores) and PWB scales. Two analyses of linear regression were conducted to study the link between optimism and academic progress both in men and women. Control variables were age, socioeconomic status and the grade-point average in the student's academic transcript. The study used a stepwise selection method and Version 16.0 of the Statistical Package for the Social Sciences (SPSS) for the statistical analysis. For all the tests carried out, bilateral statistical significance was set at p equal to or less than .05.

Results

Descriptive data of the LOT-R

Table 2 describes the means, standard deviations and response frequencies for the items in the LOT-R, as well as the item-total correlation and the estimation of the questionnaire's internal consistency. The absolute value of most of the correlations between the six items and the four filler items were found to be below .20. These results suggest that the filler items really operated as such, and these items were therefore not considered in subsequent analyses. The mean score for all the scale was 14.23 ($SD = 4.0$, 2–23) excluding the filler items. The mean for the items assessing optimism was 7.46 ($SD = 2.6$) and the mean for the items assessing pessimism was 5.22 ($SD = 2.1$). The inter-item correlations matrix was analyzed using exploratory factor analysis. The estimation of internal consistency with Cronbach's alpha for LOT-R was .724.

Dimensionality assessment

To analyze the test's factorial structure in the target population we used the maximum likelihood method with direct Oblimin rotation. The Kaiser–Meyer–Olkin (KMO) = .752 and

Table 2 Mean, standard deviation, frequencies in 291 students, analysis of the Cronbach's alpha on standardized items, and item-total correlation of LOT-R.

	Questions[a]		Frequency (n), percentage (%)						
		M (SD)	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	α	$r_{i\text{-}t}$
O1	In uncertain times, I usually expect the best	2.2 (1.1)	16 (5.5)	66 (22.7)	91 (31.3)	74 (25.4)	44 (15.1)	.695	.443
R	It's easy for me to relax	1.87 (1.0)	28 (9.68)	77 (26.5)	106 (36.4)	66 (22.7)	14 (4.8)		
P1	If something can go wrong for me, it will	1.97 (1.1)	24 (8.2)	79 (27.1)	100 (34.4)	58 (19.9)	30 (10.3)	.733	.315
O2	I'm always optimistic about my future	2.31 (1.0)	11 (3.8)	51 (17.5)	100 (34.4)	94 (32.3)	35 (12)	.641	.615
R	I enjoy my friends a lot	1.91 (1.0)	20 (6.9)	90 (30.9)	101 (34.7)	56 (19.2)	24 (8.2)		
R	It's important for me to keep busy	1.92 (1.0)	17 (5.8)	98 (33.7)	94 (32.3)	55 (18.9)	27 (9.3)		
P2	I hardly ever expect things to go my way	1.74 (.8)	16 (5.5)	91 (31.3)	142 (48.8)	37 (12.7)	5 (1.7)	.734	.273
R	I don't get upset too easily	1.92 (1.1)	17 (5.8)	98 (33.7)	94 (32.3)	55 (18.9)	27 (9.3)		
P3	I rarely count on good things happening to me	1.52 (1.0)	56 (19.2)	89 (30.6)	93 (32)	45 (15.5)	8 (2.7)	.672	.514
O3	Overall, I expect more good things to happen to me than bad	2.93 (1.0)	3 (1)	28 (9.6)	62 (21.3)	92 (31.6)	106 (36.4)	.639	.622

Note. M: mean; SD: standard deviation. α = Cronbach's alpha if item deleted; $r_{i\text{-}t}$ = corrected item-total correlation.

a Score range from 0 (*strongly-disagree*) to 4 (*strongly-agree*). Sum items 1, 3, 4, 7, 9 and 10 to obtain an overall score. Reverse code items 3, 7 and 9 prior to scoring (0 = 4) (1 = 3) (2 = 2) (3 = 1) (4 = 0).
O1, O2, and O3 are optimistic items. P1, p2, and p3 are pessimistic items. 'R' are filler items.
Cronbach's alpha based on standardized items for LOT-R was .724.

Bartlett's Test of Sphericity (χ^2 = 393.372, $p < .001$) indicate the goodness-of-fit of the correlations matrix required for this analysis. The results of the factoring by PCA and Oblimin rotation are described in Table 3.

The factorial structure shows a bidimensional solution which explains 62.3% of the variance. The first factor, which explains 43.5% of the variance, gathers the items assessing optimism, with factor loadings between .689 and .874, and reaches α = .75.

The second dimension explains 18.8%, and gathers the items assessing pessimism, with saturations between .645 and .822, and α = .49. The correlation between the dimensions was highly significant (r = .46, $p < .001$).

Given the low number of items comprising each factor, reliability would be substantially increased if the number of items was doubled (Spearman–Brown prediction formula: α = .86 for Factor 1, and α = 66 for Factor 2).

Reliability analysis

Table 4 describes the Kendall's tau correlations between the dimensions of the LOT-R and the global score of the

Table 3 Exploratory analysis of LOT-R with the values of the two factors (Oblimin rotation) and percentage of the variance explained by each factor and a sampling adequacy index (KMO).

	Variables	Factor 1	Factor 2
1O	In uncertain times, I usually expect the best	.831	
3P	If something can go wrong for me, it will		.645
4O	I'm always optimistic about my future	.874	
7P	I hardly ever expect things to go my way		.822
9P	I rarely count on good things happening to me		.537
10O	Overall, I expect more good things to happen to me than bad	.689	
Variance explained (%) for the factors		43.5%	18.8%
Cronbach's Alpha Based on Standardized Items		.754	.489

Note. Extraction method: principal component analysis.
Rotation method: Oblimin with Kaiser normalization.
KMO (Kaiser–Meyer–Olkin measure of sampling adequacy) = .752.
Bartlett's Test of Sphericity (χ^2) = 393.372, p = .0001.

Table 4   Kendall's Tau correlations between scores of LOT-R and BSI (scales and total) and PWB (scales).

Scales		LOT-R[a]	
	M (SD)	Optimism	Pessimism
1. BSI[b]. Somatization.	0.6 (0.4)	−.194[**]	.184[*]
2. BSI. Anxiety.	1.0 (0.6)	−.401[**]	.309[**]
3. BSI. Depression.	0.7 (0.6)	−.460[**]	.358[**]
4. BSI. GSI. Emotional distress.	2.5 (3.3)	−.201[**]	.147[**]
5. PWB[c]. Self-acceptance.	17.6 (3.8)	.620[**]	−.468[**]
6. PWB. Positive-relations.	24.5 (4.4)	.263[**]	−.265[**]
7.PWB. Personal-growth.	19.9 (3.5)	.434[**]	−.349[**]
8. PWB. Purpose in life.	27.9 (5.1)	.554[**]	−.389[**]
9. PWB. Autonomy.	24.6 (4.9)	.287[**]	−.294[**]
PWB. Environmental-mastery.	21.8 (4.1)	.589[**]	−.442[**]
Mean (SD)		7.46 (2.5)	5.22 (2.1)

M: mean; SD: standard deviation.
 [a] LOT-R, Revised Life Orientation Test-Revised. Pessimism: raw score.
 [b] BSI, Brief symptom Inventory, Raw score.
 [c] PWB, Psychological Well-being, Raw score.
 [*] Significant values p < .05.
 [**] Highly significant values p < .01.

scale with regard to the Brief Symptom Inventory (BSI) and the Psychological Well-Being (PWB) Scales. If we take into consideration two factors, optimism correlates negatively with the BSI, especially in Depression (r = −.460, p < .001) and Anxiety (r = −.401, p < .001) and correlates positively with the PWB Scales, especially in Self-acceptance (r = .620, p < .001), Environmental-mastery, (r = .589, p < .001), Purpose in life (r = .554, p < .001) and Personal-growth (r = .434, p < .001).

The pessimism factor (LOT-R) correlates positively with the BSI, especially in Depression (r = .358, p < .001) and Anxiety (r = .309, p < .001) and correlates negatively with the PWB Scales, especially in Self-acceptance (r = −.468, p < .001), Environmental-mastery (r = −.442, p < .001), and Purpose in life (r = −.389, p < .001).

Effect of dispositional optimism/pessimism on academic progress

We were interested in studying the link between dispositional optimism/pessimism and academic progress in both men and women. Three control variables were considered in the analyses of linear regression: age, socioeconomic status and the grade point average in the student's academic transcript. Two linear regression models were carried out – one for each gender. The average age of the men was 25.1 (SD = 5.9) and the average age of the women was 23.1 (SD = 4.7) and there were no differences between the two groups (t = 1.895, p = .065). Average socioeconomic status in men was 42.5 (SD = 16.3) while in the women this was 36.8 (SD = 14.6), with differences between the two groups (t = 2.063, p = .040). The grade-point average in the male students' academic transcripts was 7.5 (SD = .4) while in the women's this was 7.6 (SD = .5) and there were no differences between the two groups (t = −1.409, p = .160).

The mean score for optimism (LOT-R) was 8.0 (SD = 2.1) in men and 7.3 (SD = 2.6) in women and there were no statistically significant differences between the two groups (t = 1.435, p = .152). The mean score for pessimism (LOT-R) was 4.9 (SD = 2.2) in men and 5.2 (SD = 2.1) and there were no statistically significant differences in women between the two groups (t = 1.417, p = .158). Academic progress was determined by calculating the average number of credits successfully completed by the students, and in the men this was 142.1 (SD = 48.1) while in the women it was 122.3 (SD = 51.3), with no differences between the two groups (t = 2.121, p = .035).

In the men, the results of the linear regression indicated that age, socioeconomic status and the pessimism scores (LOT-R) explained 58% of the variance of the successfully completed credits (F = 8.987, p < .0001). In the women, 9.6% of the variance of the successfully completed credits could be explained by age, the grade-point average and the LOT-R scores (F = 6.206, p < .001), see Table 5.

Discussion

The results of this study suggest that the Spanish version of the LOT-R applied to students of teaching has acceptable psychometric properties. The global internal consistency is moderate (α = .72) and matches the results obtained in the original test (Scheier et al., 1994) and those obtained by Schou et al. (2004).

The test has a clear structure with two related factors; optimism and pessimism, which together explain 62.3% of the variance. The factors found show adequate psychometric properties for optimism (α = .75) and moderate properties for pessimism (α = .49) if we bear in mind the length of the instrument. Reliability of the scale would substantially increase by doubling the number of items (from six to twelve items: optimism [α = .86]; pessimism [α = .66]). The emergence of the two factors could be explained by the wording

Table 5 Two models of regression models to study the link between optimism–pessimism and academic progress based on gender.

Independent variable	Dependent variable	Adjusted R square	Unstandardized coefficients		Standardized coefficients	F	Sig.
			B	Std. error	Beta		
Constant	Academic progress in men[b]	.580	−22.72	136.46		8.98	.0001
Age			6.62	1.426	.81		
FSS			1.64	.44	.55		
Pessimism (LOT-R)[a]			6.15	2.83	.29		
Constant	Academic progress in women[c]	.096	−27.65	48.12		6.20	.0001
Age			2.11	.77	.18		
Grade-point average			13.54	6.31	.14		
Pessimism (LOT-R)			−3.20	1.54	−.13		

Note. Control variables: age, familiar Socioeconomic-Status and grade-point average in the student's academic transcript.
[a] Optimism–Pessimism scales, Raw score.
[b] Selecting only cases for which gender = man. Number of academic credit successfully completed in men: 142.1 (SD = 48.1).
[c] Selecting only cases for which gender = woman. Number of academic credit successfully completed in women: 122.3 (SD = 51.3).

of the items (the wording of items assessing optimism is positive while the wording of items assessing pessimism is negative), without affecting the questionnaire's underlying construct (McPherson & Mohr, 2005). The bidimensional model found matches the proposal made by various studies (Herzberg, Glaesmer, & Hoyer, 2006; Schou et al., 2004; Vera-Villarroel et al., 2009) indicating that the LOT-R is a measure with two separate constructs (optimism and pessimism) and that these two constructs should be considered separately. This is at odds with the results of the validation made with college students in Brazil, which found a single dimension explaining 39.78% of the variance (Bandeir et al., 2002).

The reliability coefficients are moderately high with regard to the Brief Symptom Inventory (BSI) and the Psychological Well-Being (PWB) Scales. As expected, the factor of optimism related positively with the PWB Scales (especially in self-acceptance, environmental-mastery, and purpose in life) and negatively with the BSI (especially in depression and anxiety), while the factor pessimism related negatively with the PWB Scales (especially in self-acceptance and environmental-mastery) and positively with the BSI (especially in depression and anxiety). These results agree with a number of studies that show that depressive symptoms (Mosher, Prelow, Chen, & Yackel, 2006; Vickers & Vogeltanz, 2000), somatization (Scheier & Carver, 1985) and psychological distress (Chang, Rand, & Strunk, 2000; Creed, Patton, & Bartrum, 2002) relate negatively with optimism and positively with academic adjustment at university (Schaufeli & Salanova, 2007), la professional efficacy, work engagement (Caprara, Vecchione, Alessandri, Gerbino, & Barbarenelli, 2011; Mauno, Kinnunen, & Ruokolainen, 2007) and psychological well-being (Chico & Ferrando, 2008; Haugen et al., 2004; Kivimaki et al., 2005). One explanation may be that subjective well-being and optimism are closely linked. The assessment made by college students of their subjective well-being depends to some degree on an affective component (the presence of positive and negative emotions) and on a cognitive component (the belief that the future will be

better than the present), the second of these being related to dispositional optimism.

Another interesting aspect is the relationship between optimism and academic progress on the basis of gender. Our results indicate that pessimism, age and socioeconomic status in male students explained more than half the variance of the successfully completed credits, i.e., older men with a more privileged socioeconomic status and a lower sense of self-efficacy had more staying power in their studies, while the same staying power in studies was related to age, the grade-point average in the student transcript and the respondent's sense of self-efficacy in female students. Note that these variables only explain one tenth of the staying power in studies, and that other variables intervene in the explanatory model in female students. Moreover, because of the lower number of men in the sample, the results for men should be considered with caution.

The results of our study explain the differences between men and women in academic progress, and it appears that excessive self-confidence in men is linked to less academic progress, while a certain degree of optimism is necessary in women for academic progress. The expectancy-value model of achievement performance and choice proposed by Eccles (2005) establishes the importance of confidence in self-efficacy, motivation and academic performance in the choice of educational and professional options based on gender over and above the capacities and abilities demonstrated. Some of the gender-specific differences could be explained in this model by the fact that women tend to cultivate more realistic expectations about their abilities while men over-estimate their abilities.

In light of the above, men's excessive self-confidence can lead to a lower level of academic performance, whereas the presence of greater self-confidence in women increases chances of success (Watt, 2005). The explanatory value that pessimism has in men in our study – in relation to the number of successfully completed credits suggests that men are more realistic and practical when addressing academic tasks.

To conclude, the evidence convincingly demonstrates the LOT-R questionnaire's psychometric properties and its potential as a reliable and valid instrument in studies addressing the importance of optimism in physical and psychological well-being. In men, a certain degree of pre-occupation about academic results – together with age and socioeconomic status – is linked to progress in studies, while excessive worry about academic matters in women could obstruct their successful completion of studies. The assessment of optimism/pessimism would allow researchers to quickly and efficiently identify the expectations college students will require if they are to address academic challenges, and describe the particular effort they will need to do this successfully. It would also be particularly useful for institutions wishing to implement measures to minimize student drop-out.

Future lines of research might use broader male samples to corroborate the results of this study and introduce other variables in the explanatory model, such as coping strategies, the perception of control and dispositional optimism/pessimism.

The results of this study are qualified by certain limitations. First, because the group comprised mainly female college students from a single school, the results cannot be generalized to other groups, even though the results are consistent with previous studies that suggest that the LOT-R can provide a robust measurement of dispositional optimism/pessimism, the bifactorial structure of the scale and its relationship with psychological well-being or distress. Secondly, the results for men should be approached with caution given the lower number of men in the sample. Finally, self-reported data is limited by the fact that it can rarely be verified independently, in addition to the fact that it contains potential sources of bias, such as answers that may be exaggerated, selective memory, or a desirability bias.

Acknowledgement

References

Ahrens, A. H., & Haaga, D. A. (1993). The specificity of attributional style and expectations to positive and negative affectivity, depression, and anxiety. *Cognitive Therapy and Research, 17*, 93–98.

Bandeira, M., Bekou, V., Silva Lott, K., Teixeira, M., & Silva Rocha, S. (2002). Validação transcultural do Teste de Orientação da Vida (TOV-R). *Estudos de Psicologia, 7*, 251–258.

Boman, P., & Yates, G. C. R. (2001). Optimism, hostility and adjustment in the first year of high school. *British Journal of Education Psychology, 71*(3), 401–411. http://dx.doi.org/10.1348/000709901158587

Brydon, L., Walker, C., Wawrzyniak, A. J., Chart, H., & Syeptoc, A. (2009). Dispositional optimism and stress-induced changes in immunity and negative mood. *Brain, Behavior and Immunity, 6*, 810–816. http://dx.doi.org/10.1016/j.bbi.2009.02.018

Caprara, G. V., Fagnani, C., Alessandri, G., Steca, P., Gigantesco, A., Cavalli Sforza, L. L., et al. (2009). Human optimal functioning: The genetics of positive orientation towards self, life, and the future. *Behavior Genetics, 39*, 277–284. http://dx.doi.org/10.1007/s10519-009-9267-y

Caprara, G. V., Vecchione, M., Alessandri, G., Gerbino, M., & Barbarenelli, C. (2011). The contribution of personality traits and self-efficacy beliefs to academic achievement: A longitudinal study. *British Journal of Education Psychology, 81*(1), 78–96. http://dx.doi.org/10.1348/2044-8279.002004

Chang, E. C. (1998). Dispositional optimism and primary and secondary appraisal of a stressor: Controlling for confounding influences and relations to coping and psychological and physical adjustment. *Journal of Personality and Social Psychology, 74*, 1109–1120. http://dx.doi.org/10.1037/0022-3514.74.4.1109

Chang, E. C., Rand, K. L., & Strunk, D. R. (2000). Optimism and risk for job burnout among working college students: Stress as a mediator. *Personality and Individual Differences, 29*, 255–264. http://dx.doi.org/10.1016/S0191-8869(99)00191-9

Chemers, M., Hu, L., & Garcia, B. F. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal of Educational Psychology, 93*, 55–64. http://dx.doi.org/10.1037/0022-0663.93.1.55

Chico, E., & Ferrando, P. (2008). Variables cognitivas y afectivas como predictoras de satisfacción en la vida. *Psicothema, 20*, 408–412.

Chrisler, J. C., & McCreary, D. R. (2010). *Handbook of gender research in psychology*. New York, NY: Springer.

Creed, P. A., Patton, W., & Bartrum, D. (2002). Multidimensional properties of the LOT-R: Effects of optimism and pessimism on career and well-being related variables in adolescents. *Journal of Career Assessment, 10*, 42–61. http://dx.doi.org/10.1177/1069072702010001003

Derogatis, L. R. (2001). *Brief Symptom Inventory (BSI-18). Administration, scoring and procedures manual*. Minneapolis, MN: NCS Pearson, Inc.

Eccles, J. (2005). Studying the development of learning and task motivation. *Learning and Instruction, 15*(2), 161–171.

Fine, C. (2010). *Delusions of gender: How our minds, society, and neurosexism create difference*. New York, NY: W. W. Norton & Company.

Gillham, J. E., Shatte, A. J., Reivich, K. J., & Seligman, M. E. P. (2001). Optimism, pessimism and explanatory style. In E. C. Chang (Ed.), *Optimism and pessimism. Implications for theory, research and practice* (pp. 53–75). Washington, DC: American Psychological Association.

Hatchett, G., & Park, H. L. (2004). Relationships among optimism, coping styles, psychopathology, and counseling outcome. *Personality and Individual Differences, 36*, 1755–1769. http://dx.doi.org/10.1016/j.paid.2003.07.014

Haugen, R., & Lund, T. (2002). Self-concept, attributional style and depression. *Educational Psychology, 223*, 305–315. http://dx.doi.org/10.1080/01443410220138539

Haugen, R., Ommundsen, Y., & Lund, T. (2004). The concept of expectancy: A central factor in various personality dispositions. *Educational Psychology, 24*, 43–55. http://dx.doi.org/10.1080/0144341032000146430

Herzberg, P. Y., Glaesmer, H., & Hyer, J. (2006). Separating optimism and pessimism: A robust psychometric analysis of the revised life orientation test (LOT-R). *Psychological Assessment, 18*(4), 433–438. http://dx.doi.org/10.1037/1040-3590.18.4.433

Hollingshead, A. B. (1975). *Four factor index of social status*. Unpublished manuscript, Yale University, New Haven, CT.

Kivimaki, M., Elovainio, M., Singh-Manoux, A., Vahtera, J., Helenius, H., & Pentti, J. (2005). Optimism and pessimism as predictors of change in health after death or onset of severe illness in family. *Health Psychology, 24*, 413–421.

Koivusaari, R. (2006). Cognitive strategies and computer-supported learning environments. *Educational Psychology, 19*(3), 309–322. http://dx.doi.org/10.1080/0144341990190305

Lyubomirsky, S. (2008). *La ciencia de la felicidad*. Barcelona, Spain: Uranos.

Marshall, G. N., Wortman, C. B., Kusulas, J. W., Hervig, L. K., & Vickers, R. R., Jr. (1992). Distinguishing optimism from pessimism: Relations to fundamental dimensions of mood and personality. *Journal of Personality and Social Psychology*, *62*, 1067–1074. http://dx.doi.org/10.1037/0022-3514.62.6.1067

Mauno, S., Kinnunen, U., & Ruokolainen, M. (2007). Job demands and resources as antecedents of work engagement: A longitudinal study. *Journal of Vocational Behavior*, *70*, 149–171. http://dx.doi.org/10.1016/j.jvb.2006.09.002

McPherson, J., & Mohr, P. (2005). The role of item extremity in the emergence of keying-related factors: An exploration with Life Orientation Test. *Psychological methods, 10*, 120–131. http://dx.doi.org/10.1037/1082-989X.10.1.120

Mosher, C. E., Prelow, H. M., Chen, W. W., & Yackel, M. E. (2006). Coping and social support as mediators of the relation of optimism to depressive symptoms among black college students. *Journal of Black Psychology*, *32*, 72–86. http://dx.doi.org/10.1177/0095798405282110

National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. (1978). *The Belmont report: Ethical principles and guidelines for the protection of human subjects of research.*. Retrieved from www.bioeticayderecho.ub.es

Otero, J. M., Luengo, A., Romero, E., Gómez-Fraguela, J. A., & Castro, C. (1998). *Psicología de la personalidad. Manual de prácticas*. Barcelona, Spain: Ariel Practicum.

Pavez, P., Mena, L., & Vera-Villarroel, P. (2012). El rol de la felicidad y el optimismo como factor de protector de la ansiedad. *Universitas Psychologica, 11*(29), 369–380.

Robinson-Whelen, S., Kim, C., MacCallum, R., & Keicolt-Glaser, J. K. (1997). Distinguishing optimism from pessimism in older adults: Is it more important to be optimism or not to be pessimism? *Journal of Personality and Social Psychology*, *73*, 1345–1353. http://dx.doi.org/10.1037/0022-3514.73.6.1345

Ryff, C. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*, 1069–1081.

Ryff, C. D., Keyes, C. L. M., & Hughes, D. L. (2003). Status inequalities, perceived discrimination, and eudaimonic well-being: Do the challenges of minority life hone purpose and growth? *Journal of Health and Social Behavior*, *44*(3), 275–291. http://dx.doi.org/10.2307/1519779

Ryff, C., & Keyes, C. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*, 719–727. http://dx.doi.org/10.1037/0022-3514.69.4.719

Schaufeli, W. B., & Salanova, M. (2007). Efficacy or inefficacy, that's the question: Burnout and work engagement, and their relationships with efficacy beliefs. *Anxiety, Stress, and Coping, 20*(2), 177–196. http://dx.doi.org/10.1080/10615800701217878

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implication of generalized outcome expectancies. *Health Psychology*, *4*(3), 219–247. http://dx.doi.org/10.1037/0278-6133.4.3.219

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self mastery and self esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, *67*(6), 1063–1078. http://dx.doi.org/10.1037/0022-3514.67.6.1063

Scheier, M. F., Carver, C. S., & Bridges, M. W. (2001). Optimism, pessimism and psychological well-being. In E. C. Chang (Ed.), *Optimism and pessimism. Implications for theory, research and practice* (pp. 189–216). Washington: American Psychological Association.

Schou, I., Ekeberg, Ø., Ruland, C. M., Sandwik, L., & Karesen, R. (2004). Pessimism as a predictor of emotional morbidity one year following breast cancer surgery. *Psycho-oncology*, *13*, 309–320. http://dx.doi.org/10.1002/pon.747

Throndsen, I. (2010). Self-regulated learning of basic arithmetic skills: A longitudinal study. *British Journal of Educational Psychology*, *81*(4), 558–578. http://dx.doi.org/10.1348/2044-8279.002008

Vera-Villarroel, P., Córdoba-Rubio, N., & Celis-Atenas, K. (2009). Evaluación del optimismo: un análisis preliminar del *Life Orientation Test* versión revisada (LOT-R) en población chilena. *Universitas Psychologica, 8*(1), 61–68.

Vera-Villarroel, P., Zych, I., Celis-Atenas, K., Córdova- Rubio, N., & Buela-Casal, G. (2011). Chilean validation of the Posttraumatic Stress Disorder Checklist – Civilian version (Pcl-C) after the earthquake on February 27, 2010. *Psychological Reports, 109*, 47–58.

Vickers, K. S., & Vogeltanz, N. D. (2000). Dispositional optimism as a predictor of depressive symptoms over time. *Personality and Individual Differences*, *28*(2), 259–272. http://dx.doi.org/10.1016/S0191-8869(99)00095-1

Visani, D., Albieri, E., Offidani, E., Ottolini, F., Tomba, E., & Ruini, C. (2011). Gender differences in psychological well-being and distress during adolescence. In I. Brdar (Ed.), *The human pursuit of well-being: A cultural approach* (pp. 65–70). New York, NY: Springer Science.

Watt, H. M. G. (2005). Explaining gendered math enrollments for NSW Australian secondary school students. *New Directions for Child and Adolescent Development, 110*, 15–29.