



Dietary restraint, life satisfaction and self-discrepancy by gender in university students

Berta Schnettler^{a,*}, Klaus G. Grunert^b, Ligia Orellana^c, José Sepúlveda^d, Horacio Miranda^a, Germán Lobos^e, Cristian Adasme-Berrios^f, Marianela Denegri^d, Marcos Mora^g, Natalia Salinas-Oñate^c, Clementina Hueche^c, Soledad Etchebarne^h

^a Departamento de Producción Agropecuaria, Facultad de Ciencias Agropecuarias y Forestales, Universidad de La Frontera, Chile

^b MAPP Centre, Aarhus University, Denmark

^c Centro de Psicología Económica y del Consumo, Universidad de La Frontera, Chile

^d Departamento de Psicología, Facultad de Educación, Ciencias Sociales y Humanidades, Universidad de La Frontera, Chile

^e Escuela de Ingeniería Comercial, Facultad de Ciencias Empresariales, Universidad de Talca, Talca, Chile

^f Departamento de Administración y Economía, Facultad de Ciencias Sociales y Económicas, Universidad Católica del Maule, Talca, Chile

^g Departamento de Economía Agraria, Facultad de Ciencias Agronómicas, Universidad de Chile, Santiago, Chile

^h Departamento de Administración, Facultad de Economía y Negocios, Universidad de Chile, Santiago, Chile

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ABSTRACT

This study aimed to characterize dieting and non-dieting university students by gender, based on their satisfaction with life and their food-related life, self-discrepancy, food behavior and health-related aspects. A non-probabilistic sample of 305 students from five Chilean state universities responded a questionnaire that included the Revised Restraint Scale, the Satisfaction with Life Scale, the Satisfaction with Food-related Life Scale, the Health-related Quality of Life Index, the Nutrition Interest Scale and the Self-Discrepancy Index. Socio-demographic characteristics, food behavior, and approximate weight and height were also enquired. Chronic dieters and non-dieters were distinguished according to the median score of the Revised Restraint Scale. 51.1% of women and 55.5% of men classified as chronic dieters, sharing characteristics such as nutrition concern, mental health problems, higher body mass index, and physical and economic self-discrepancy. Women dieters reported lower life satisfaction and satisfaction with food-related life, more health problems and health-related restriction of food, while men dieters showed higher social and emotional self-discrepancy.

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* Corresponding author.

E-mail address: berta.schnettler@ufrontera.cl (B. Schnettler).

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Restricción alimentaria, satisfacción con la vida y discrepancia del yo en estudiantes universitarios de distinto género

R E S U M E N

Palabras clave:

Restricción alimentaria
Satisfacción vital
Teoría de la auto-discrepancia
Diferencias de género

El objetivo de este estudio fue caracterizar a estudiantes universitarios dietantes y no dietantes de distinto género, según su satisfacción con la vida y con la alimentación, discrepancia del yo, comportamiento alimentario y aspectos relacionados con la salud. Se aplicó un cuestionario a una muestra no probabilística de 305 estudiantes de cinco universidades estatales de Chile. El cuestionario incluyó la Escala Revisada de Restricción Alimentaria, la Escala de Satisfacción con la Vida, la Escala de Satisfacción con la Alimentación, el Índice de Calidad de Vida relativo a la Salud, la Escala de Interés por la Nutrición y la Escala de Discrepancia del Yo. Se consultaron características sociodemográficas, comportamiento alimentario y el peso y estatura aproximados. Con base en la mediana de la Escala Revisada de Restricción Alimentaria se distinguieron dietantes crónicos y no dietantes. El 51.1% de las mujeres y el 55.5% de los hombres fueron clasificados como dietantes crónicos, quienes comparten características como la preocupación por la nutrición, problemas de salud mental, mayor índice de masa corporal, y discrepancia del yo en los ámbitos físico y económico. Las mujeres dietantes estuvieron menos satisfechas con su vida y con su alimentación, reportaron más problemas de salud y superior restricción de alimentos por motivos de salud. Los hombres dietantes mostraron mayor discrepancia del yo en los ámbitos social y emocional.

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The transition from high school to university entails high levels of stress and significant changes in life demands, expectations and conditions. Changes also occur in dietary behaviors, since eating habits developed and maintained in childhood and adolescence tend to change as the person enters university and is challenged to manage healthful weight and lifestyle (Deliens, Clarys, Van Hecke, De Bourdeaudhuij, & Deforche, 2013; Michelini, Acuña, & Godoy, 2016). However, some studies report that many university students do not follow healthy diets, which causes an increase in weight, fat and body mass index (BMI) (Deliens et al., 2013). Although a certain amount of weight gain can be expected at this stage in life, students who gain weight – particularly large amounts – may experience this as a significant stressor and resort to unhealthy weight control behaviors to cope with it. In this regard, the youth are at a particularly high risk for disturbed eating behaviors or abnormal practices (e.g. restraint, emotional or disinhibited binge eating) associated with eating disorders (Quick & Byrd-Bredbenner, 2013).

Dietary intake, eating behaviors and their consequences tend to vary by gender (Orellana, Sepúlveda, & Denegri, 2013). Nevertheless, most research has focused only on women populations; therefore, the factors associated with eating disorders among men are poorly understood (Darcy et al., 2012). Moreover, evidence from recent epidemiological studies indicates that the prevalence of eating disorder is increasing in both men and women (Cain, Epler, Steinley, & Sher, 2012).

Some authors (Bentley, Gratwick-Srall, Harrison, & Mond, 2015) suggest that dietary restriction remains more common in women than men, though the gap may be narrowing. Dietary restraint refers to intentional and sustained restriction of food intake in order to maintain or lose weight (van Strien, Herman, & Verheijden, 2012). However, self-reported

restrained eaters, or chronic dieters, do not eat less than their unrestrained counterparts and, in fact, are even more likely to have a higher BMI than non-dieters (Silva, 2010) and be overweight (Provencher et al., 2009; van der Laan & Smeets, 2015). A chronic tendency to restrict food intake comes, paradoxically, with episodes of binge eating (Herman & Polivy, 1980), and, even after weight loss, concerns with body shape and size persist (Vieira et al., 2013). In this regard, Vartanian (2012) explains that individuals compare one self-state to another self-state and when there is discrepancy between them, negative internal states arise. This is known as the Self-Discrepancy Theory (Higgins, 1987), which proposes a link between discrepancies in self-concept and both physical and emotional well-being, indicating that discrepancies within the individual's self-concept cause negative emotions (e.g. anxiety), cognitions (e.g. body dissatisfaction) and behaviors (e.g. disordered eating) (Halliwell & Dittmar, 2006). The implications of body-related self-discrepancies for individuals' psychological well-being are well established (Polivy & Pliner, 2015; Vartanian, 2012), and satisfaction with physical appearance may be highly influential among both women and men (Matthews, Zullig, Ward, Horn, & Huebner, 2012). In a sample of women adolescents, Ting, Huang, Tu, and Chien (2012) found that depressive symptoms were caused by the women's attempt to diet or failure to lose weight by dieting, rather than by their weight status. Likewise, studies have revealed that body dissatisfaction in men is associated with negative psychological consequences, including depression and low self-esteem (Bergeron & Tylka, 2007).

Research shows that eating disorders in youth are related with poor psychological health (Bentley et al., 2015; Gomez, Gonçalves, & Costa, 2015; Ting et al., 2012), and lower levels of life satisfaction (Remick, Pliner, & McLean, 2009; Schnettler

et al., 2014) and satisfaction with food-related life (Schnettler et al., 2014). Life satisfaction (LS) is the cognitive component of subjective well-being, either overall or by specific domains (Diener, Emmons, Larsen, & Griffin, 1985). In the food domain, satisfaction with food-related life is defined as a person's overall assessment regarding their food and eating habits (Grunert, Dean, Raats, Nielsen, & Lumbers, 2007). However, the literature is not conclusive on the relation between dietary restraint, subjective well-being and psychological health among men and women. Weight gain seems to be associated with greater well-being for men (Provencher et al., 2009), while some studies have reported that dieting is associated with lower LS only for women university students (Remick et al., 2009). In contrast, Bentley, Mond, and Rodgers (2014) found that dietary restriction was associated with lower LS in both men and women. Likewise, Bentley et al. (2015) found that eating disorders were associated with psychological distress in both men and women. Schnettler et al. (2014) have reported that both male and female undergraduates who are chronic dieters experience lower LS and satisfaction with food-related life if they cannot control their weight. In addition, Ambwani, Slane, Thomas, Hopwood, and Grilo (2014) found that problems with interpersonal functioning and affect regulation are associated significantly with eating disorders symptomatology in both men and women.

The aims of this study are to distinguish dieter and non-dieter university students of both genders and characterize each group by their level of LS, satisfaction with food-related life, self-discrepancy (SD), food behavior and health-related aspects.

It is expected that levels of LS and satisfaction with food-related life will be lower in dieting students of both genders, and that they will report more health problems than non-dieters. In addition, it is expected that discrepancy will be higher among chronic dieters of both genders, and that the interest on nutrition will be higher in women and dieters of both genders.

Methods

Participants

The convenience sample comprised 305 students (60.2% women) from five state universities of different geographical areas of Chile. All participants were volunteers, with a mean age of 21.5 years old ($SD = 2.76$), and 91.1% resided in an urban area.

Instruments

The questionnaire included the following scales:

Revised Restraint Scale – RRS (Herman & Polivy, 1980; Spanish Version by Silva, 2010)

A 10-item scale with two dimensions: Diet Concern (DC) which evaluates a person's tendency to restrain their food intake and the fear to gain weight (e.g. "Do you give too much time and thought to food?"); and Weight Fluctuations (WF), which registers weight fluctuation (e.g. "What is the maximum amount of

weight (in kilos) you have ever lost within 1 month?"). In studies in Chile with mixed gender samples (Schnettler et al., 2014), the scale has demonstrated the same two-factor structure, but using only seven of the ten items. In this study, the scale showed good reliability (Cronbach's α DC = .68; Cronbach's α WF = .71).

Satisfaction with Life Scale – SWLS (Diener et al., 1985; Spanish Version by Schnettler, Miranda, Sepúlveda, & Denegri, 2011)

It consists of five items grouped into a single factor to evaluate overall cognitive judgments about a person's own life (e.g. "In most ways my life is close to my ideal"), with a six-point response format (1: *disagree completely* to 6: *agree completely*). This scale has shown good internal reliability in previous studies in Chile (Schnettler et al., 2014, 2015), and it showed good reliability in this study ($\alpha = .87$).

Satisfaction with Food-related Life – SWFL (Grunert et al., 2007; Spanish Version by Schnettler et al., 2011)

It consists of five items grouped in a single dimension (e.g. "Food and meals are positive elements"), with a six-point response format (1: *disagree completely* to 6: *agree completely*). This scale has shown good internal reliability in previous studies in Chile (Schnettler et al., 2014, 2015), and it showed good reliability in this study ($\alpha = .84$).

Health-related Quality of Life Index – HRQOL-4 (Hennessy, Moriarty, Zack, Scherr, & Brackbill, 1994; Spanish Version by Schnettler et al., 2013)

Four items that explore the self-perception of health, recent physical and mental health, and recent limitations on activity. The scale showed good reliability in this study ($\alpha = .73$), using three of the four items, as it has been done in the Dutch version (Toet, Raat, & van Ameijden, 2006) and in previous studies in Chile (Schnettler et al., 2015).

Nutrition Interest Scale – NIS (Desai & Ratneshwar, 2003)

A four-item scale that measures a person's concern about the consumption of a specific type of food based on its nutritional value (e.g. "Whenever I buy a new food, I check its nutritional information"), with a six-point response format (1: *disagree completely* to 6: *agree completely*). In this study, a translation/back-translation method was used to obtain a Spanish version. The scale showed good reliability ($\alpha = .81$).

Self-Discrepancy Index – SDI (Halliwell & Dittmar, 2006; Spanish Version by Luna-Arocas & Quintanilla, 1999)

It consists of seven items that measure the subjective difference that a person perceives between the ideal and the real self, in the intellectual, physical, social, personal, emotional and economic dimensions. All items start with the sentence "I want to be..." and participants rate each of these dimensions in a four-point scale (1: *As I am* to 4: *Much better than I am*). In this study, a translation/back-translation method was used to obtain a Spanish version. The scale showed good reliability in this study ($\alpha = .83$).

Socio demographic and food behavior measures

Students were asked about: (a) socioeconomic status (SES); (b) place of residence during the academic period; (b) an estimation of weight and height in order to obtain their BMI (kg/m^2) (c) frequency of consumption of eight groups of foodstuffs and drinks categorized by the National Statistics Institute in the Surveys of Family Budgets; and (d) intake restriction of certain foods as well as their reasons to do so. These methods of data collection on students' food behavior was chosen over other widely used methods, such as the food frequency questionnaire, due to the geographical distribution of the sample and cultural variables that influence eating habits of the Chilean population throughout the country. While in northern Chile (Universidad de Tarapacá) eating habits are influenced by the indigenous Aymara culture, in the central area (Universidad de Chile and Universidad de Talca), there is a greater influence of Spanish cuisine. Eating habits in La Araucanía region (Universidad de La Frontera) are influenced both by the native Mapuche culture and the cuisine introduced by immigrants mainly from German, Swiss and Italian origin. Similarly, in the extreme southern part of Chile (Universidad de Magallanes), Croatian immigrants have influenced eating habits. Thus we chose not to use a food frequency questionnaire, because one of its limitations is that, if the food list does not include a food or foods that contributes significantly to intake for some segment of respondents, it may not provide an accurate qualitative picture of the intake (Shai, Shahar, Vardi, & Fraser, 2004).

Procedure

Prior to the survey, the questionnaire was pretested with 30 university students who fulfilled the participant criteria. As no problems were detected in the pretest, no changes were required in the questionnaire. The survey was administered in March and May 2014 through the online survey platform *QuestionPro*. The participants signed informed consent statements before responding. The Ethics Committee of the Universidad de La Frontera approved the execution of the study.

Statistical analyses

Considering that most studies have used the RSS only in women, and due to the fact that factorial invariance across genders has not been studied in university students, a multistage procedure was conducted into the framework of multiple-group confirmatory factor analysis (Dimitrov, 2010). The RRS model obtained by Schnettler et al. (2014) was used as a baseline model and tested for data fit in each gender separately. Analyses were conducted using *Mplus v. 6.0*. The models were compared using the χ^2 difference (Dimitrov, 2010).

Following Herman and Polivy (1980), chronic dieters and non-dieters were distinguished among women and men separately, according to the median score of the RRS. In the women subsample ($M = 15$), 51.1% classified as chronic dieter and 48.9% as non-dieter; in the men subsample ($M = 14$), 55.5% of the sample classified as chronic dieter and 44.5% as non-dieter.

To describe the chronic dieters and non-dieters, discrete variables were analyzed using Pearson's χ^2 test, and continuous variables with Student's *t*-test. These results were analyzed using the SPSS v.23.0 software.

Results

Sample description

The sample comprised mainly students living with their parents all year round (46.6%). 25.9% belonged to high-middle SES and 31.1% to middle-middle SES. The average BMI of the sample was $23.97 \text{ kg}/\text{m}^2$ ($SD = 3.6$). The participants' nutritional state classified as low weight range for 1.3% of the sample ($\text{BMI} < 18.5$), normal weight range for 70.2% ($\text{BMI} 18.5\text{--}24.99$), overweight for 22.3% ($\text{BMI} \geq 25$) and obesity for 6.2% ($\text{BMI} \geq 30$).

Most of the students in the sample reported consuming bread (68.2%), soft drinks and juice (46.6%) and vegetables (47.5%) on a daily basis; cereals and pasta (56.4%), milk and dairy products (42.0%), meat (51.8%) and fruit (40.7%) two or three times a week; and occasionally fish and seafood (50.5%). The majority of respondents did not restrict consumption of sugar (54.4%), pastries (63.0%), salt (57.4%), fried and fatty food (47.9%), pasta and rice (88.5%), red meat (82.3%) and alcohol (44.6%).

Men and women differed in the reported consumption frequency of vegetables and fruits, due to a higher proportion of women that reported daily consumption ($p < .05$). Both sub-samples differed in the consumption restriction of fried, fatty foods and red meat ($p < .05$). In both cases, differences are explained by the higher proportion of men who did not restrict consumption of this type of food, while a higher proportion of women reported restriction of fried and fatty foods due to health problems, and restriction of red meat because they disliked it. Both genders also differed in their assessment of general health (HRQOL-4), with women indicating a worse health self-perception ($p < .05$), as well as a significantly higher number of days with health problems than men ($p < .05$). Men and women did not differ in their SES, SDI, NIS, SWLS and SWFL scores, nor their BMI.

Table 1 shows the RRS invariance analysis across gender. The χ^2 difference between model 1 and model 0 was not statistically significant, $\Delta\chi^2 (5) = 7.661$ ($p > .05$), thus indicating invariance of the factor loadings across genders. Similar results were observed in the differences of models 2 and 1, indicating that there were invariant factor loadings and invariant intercepts across genders. Also, the χ^2 difference between model 3 and model 2 was not statistically significant, $\Delta\chi^2 (7) = 5.191$ ($p > .05$), indicating that there were invariant equal factor loadings, equal indicator intercepts, and equal item uniquenesses (error variances and covariances) across genders. Therefore, the results indicated that the model demonstrated strict invariance across gender.

Dietary restraint in women

Female chronic dieters and non-dieters (Table 2) differed significantly in their reported BMI and their RRS, SWLS, NIS scores, days with mental health problems ($p < .001$), days with

Table 1 – Factorial invariance across genders.

Model	χ^2	df	$\Delta\chi^2$	Δp -value	RMSEA
Model 0: Configural	47.506	26			.074
Model 1. Weak (Metric: Loadings)	55.167	31	7.661	.175	.072
Model 3. Strong (Load. + Intercepts)	62.195	36	7.028	.218	.069
Model 4. Strict (Load. + Interc. + Residuals)	67.386	43	5.191	.063	.061

χ^2 : Chi² test.
df: degree of freedom.
 Δ = Delta between a model and previous model.
 $\Delta\chi^2$: Delta Chi².
 Δp -value: statistical significance of Delta Chi².
RMSEA: Root Mean Square Error of Approximations.

Table 2 – Characterization of female chronic dieters and non-dieters, by BMI, RRS, SWLS, SWFL, NIS, days with mental health problem and days with interruption of daily activities due to a health condition.

Component	Chronic dieters (n = 94)	Non-dieters (n = 90)	p-Value
RRS	17.94	11.58	.000**
BMI	25.49	22.23	.000**
NIS	15.52	12.76	.000**
SWLS	20.54	22.72	.001**
SWFL	17.81	19.77	.007*
Mental health problems in the last 30 days	8.11	4.57	.001**
Days with interruption of daily activities due to a health condition	2.53	1.67	.013*

p value correspond to Student's t-test to related samples (paired), equal variances assumed.
* Significant at 5%.
** Significant at 1%.
BMI: body mass index.
RRS: Revised Restraint Scale.
SWLS: Satisfaction with Life Scale.
SWFL: Satisfaction with Food-related Life Scale.
NIS: Nutrition Interest Scale.

health-related problems to conduct their daily activities, SWFL score ($p < .05$), and in their SD regarding physical appearance (Table 3), physical performance and on the economic level ($p < .001$). Both groups also differed in their restriction of consumption of sugar (Table 4), salt, pastries, pastas, rice and potatoes ($p < .05$), and their assessment of their general health conditions ($p < .001$).

Women who were chronic dieters (51.1%) had a significantly higher score on the RRS and NIS than non-dieters (48.9%). Their reported BMI, days with mental health problems and days of health-related interruptions of their normal activities were also higher than non-dieters, while their SWLS and SWFL scores were significantly lower (Table 2). Chronic dieters reported significantly higher SD scores on the physical, both performance (weight and sports) as well as beauty, attractiveness and economic dimensions (Table 3).

A higher proportion of female chronic dieters restricted the consumption of sugar (13.8%), pastries (16.0%), salt (10.6%), pasta, rice and potatoes (8.5%) due to health problems. On the other hand, most non-dieters did not restrict the consumption of pasta (Table 4), rice and potatoes (93.3%), but did restrict the consumption of salt to prevent diseases (38.9%). Regarding health self-perception, a significant proportion of chronic dieters perceived their health as "regular" (33.0%) while non-dieters significantly perceived their health as "very good" (28.9%).

Dietary restriction in men

Male chronic dieters and non-dieters (Table 5) differed significantly in their RRS score ($p < .001$), reported BMI, NIS score and days with mental health problems ($p < .05$), and in their

Table 3 – Self-Discrepancy Scores from female chronic dieter and non-dieter.

Levels	Chronic dieters (n = 94)	Non-dieters (n = 90)	p-Value
Physical (weight, sports, etc.)	2.90	2.22	.000*
Physical (beauty and attractiveness)	2.23	1.61	.000*
Economical (money, status)	2.37	2.06	.000*

p value correspond to Student's t-test to related samples (paired), equal variances assumed.
* Significant at 5%.

Table 4 – Restriction of food and condiment consumption and general health assessment (%) with statistically significant differences in female chronic dieter and non-dieter.

	Chronic dieters (n = 94)	Non-dieters (n = 90)	
Restricted consumption of sugar			p = .003
No restriction	44.7	65.6	
Yes, due to health problems	13.8	1.1	
Yes, to prevent diseases	36.2	28.9	
Yes, I dislike it	5.3	4.4	
Restricted consumption of pastries			p = .014
No restriction	53.2	65.6	
Yes, due to health problems	16.0	2.2	
Yes, to prevent diseases	23.4	24.4	
Yes, I dislike it	7.4	7.8	
Restricted consumption of salt			p = .030
No restriction	58.5	52.2	
Yes, due to health problems	10.6	2.2	
Yes, to prevent diseases	23.4	38.9	
Yes, I dislike it	7.4	6.7	
Restricted consumption of pasta, rice and potatoes			p = .014
No restriction	78.7	93.3	
Yes, due to health problems	8.5	0.0	
Yes, to prevent diseases	9.6	5.6	
Yes, I dislike it	3.2	1.1	
Do you consider your general health (HRQOL-4)			p = .001
Bad	8.5	2.2	
Regular	33.0	12.2	
Good	41.5	51.1	
Very good	14.9	28.9	
Excellent	2.1	5.6	

p value corresponds to the (bilateral) asymptotic significance obtained in Pearson's Chi squared test.
HRQOL-4: Health-related Quality of Life Index.

SD regarding physical appearance (Table 6), physical performance, social, emotional and economic levels ($p < .001$). Both groups (Table 7) also differed in their restriction of consumption of pastries ($p < .05$).

Men who classified as chronic dieters (55.5%) had a significantly higher score on the RRS and NIS than non-dieters (44.5%). Their reported BMI and days with mental health problems were also higher than non-dieters (Table 5). The first group reported significantly higher SD scores on the physical – in both performance and attractiveness – social, emotional and economic dimensions (Table 6). A higher proportion of chronic dieters restricted the consumption of pastries (24.2%) to prevent diseases (Table 7).

Discussion

This study distinguished dieter and non-dieter university students of both genders, and characterizing each group based on their levels of LS and satisfaction with food-related life, SD, their eating habits and health-related aspects. Chronic dieters in both genders were detected, which is line with authors who suggest that the prevalence of eating disorder features may be increasing in both men and women (Cain et al., 2012). Our results support the need to further research eating disorders and dietary restraint in samples of both genders, and particularly in male samples.

Our results contribute to the identification of some characteristics and behaviors that are common in dieters and non-dieters of both genders, and others that differ. Male and female chronic dieters have a higher BMI than non-dieters, in agreement with previous studies (Silva, 2010). Nevertheless, only the average BMI of women dieters is considered overweight, as indicated by previous studies (Provencher et al., 2009; van der Laan & Smeets, 2015), while the average BMI of men dieters is slightly below and thus can be classified as normal weight. This allows suggesting that men dieters are more successful in maintaining their desired weight by dieting than women, who may turn to binge-eating after strict dieting (Herman & Polivy, 1980). Although it has been reported that women tend to have a greater interest than men in healthy diets (Leblanc, Bégin, Corneau, Dodin, & Lemieux, 2015), the NIS scores did differ between dieters and non-dieters regardless of gender. Consequently, the significantly higher NIS scores in chronic dieters indicate that men and women with dietary restraint are concerned with the kind of food they eat and feel guilty after eating high-calorie foods.

Table 5 – Average BMI, RRS and NIS Scores, and average days with reported mental health problems from cluster analysis, from male chronic dieter and non-dieter.

	Chronic dieters (n = 66)	Non-dieters (n = 53)	p-Value
RRS	17.19	10.56	.000**
BMI	24.87	23.08	.003*
NIS	14.18	12.26	.027*
Mental health problems in the last 30 days	5.92	2.92	.026*

p value corresponds to Student's t-test to related samples (paired), equal variances assumed.

* Significant at 5%.

** Significant at 1%.

BMI: body mass index.

RRS: Revised Restraint Scale.

NIS: Nutrition Interest Scale.

Table 6 – Self-Discrepancy Scores from male chronic dieter and non-dieter.

Levels	Chronic dieters (n = 66)	Non-dieters (n = 53)	p-Value
Physical (weight, sports, etc.)	2.64	2.26	.027*
Physical (beauty and attractiveness)	1.95	1.49	.007*
Social (friends, family)	1.79	1.43	.025*
Emotional (feelings, emotions)	1.94	1.42	.002*
Economic (money, status)	2.36	1.92	.013*

p value corresponds to Student's t-test to related samples (paired), equal variances assumed.
* Significant at 5%.

Table 7 – Restriction of food consumption (%) with statistically significant differences in male chronic dieter and non-dieter.

	Chronic dieters (n = 66)	Non-dieters (n = 53)
Restricted consumption of pastries	p = .036	
No restriction	57.6	81.1
Yes, due to health problems	3.0	3.8
Yes, to prevent diseases	24.2	9.4
Yes, I dislike it	15.2	5.7

Note: p value corresponds to the (bilateral) asymptotic significance obtained in Pearson's Chi squared test.

Another aspect that both genders have in common regarding dietary restraint is the significantly higher number of days with mental health problems reported by chronic dieters. This finding is consistent with studies that show that eating disorders in youth are related to poor psychological health in general (Ting et al., 2012), in both men and women youth samples (Bentley et al., 2015). Future research should inquire into the kind of mental health problems that affect chronic dieter students of both genders.

In terms of differences between chronic dieters of either gender, women in this group also reported more days in the last month in which they could not carry out their daily activities normally due to health problems. Contrary to recent studies showing that both men and women dieters have lower LS (Bentley et al., 2014; Schnettler et al., 2014), our results confirm that dieting is associated with lower LS only for female university students (Remick et al., 2009). Differences between these results and those from Schnettler et al. (2014) may stem from the fact that these authors did not analyze men's and women's scores separately, working with a mixed group of chronic dieters with low LS. In such case, the overall score may have been influenced by the women's lower score and not men's. This could be a plausible explanation for the low SWFL scores reported by the same authors in dieters of both genders. However, it may be that the significantly lower levels of LS and SWFL in women chronic dieters are associated to the BMI categorized as overweight. This suggests that chronic dieter students experience lower LS and SWFL if they cannot maintain their weight.

According to Higgins (1987), individuals with eating disorders may present a wide SD because of the over-evaluation of physical appearance. In this respect, men and women

chronic dieters showed a significantly higher discrepancy on the physical domain, both related to performance and attractiveness. This is consistent with findings by Matthews et al. (2012) in a college student sample analyzed separately by gender, in which satisfaction with physical appearance was strongly related to eating disorders. Such discrepancy is also concordant with studies that link body-related self-discrepancies with mental health problems in both men and women (Bergeron & Tylka, 2007; Halliwell & Dittmar, 2006; Polivy & Pliner, 2015; Ting et al., 2012; Vartanian, 2012).

Although the association with physical self-discrepancy was expected, to the best of our knowledge, this study is one of the first that relate dietary restraint to self-discrepancy in a number of domains. The higher discrepancy was found in the economic domain for both women and men chronic dieters, although no differences were detected in the SES among dieters and non-dieters of both genders. In fact, there is evidence (Tabler & Utz, 2015) that indicates that men with eating disorders, while concerned about weight and appearance, may continue to place importance on socioeconomic attainment, due to men-specific pressures to be financially successful. Although the economic self-discrepancy in female chronic dieters requires new research, it is possible that the explanation for this perceived economic discrepancy in women is similar to that which occurs among men.

Another remarkable result is the significantly higher discrepancy in the social domain in men chronic dieters. This is in partial agreement with studies that report that individuals with eating disorders have poorer social support (Bentley et al., 2014). However, eating is a social activity and those around the individual influence food intake (Polivy & Pliner, 2015). Thus, it can be suggested that the highest discrepancy observed in chronic dieters may be related to family and peer pressure, while they may promote healthful eating in chronic dieters instead of strict diets that alternate with overeating episodes (Polivy & Pliner, 2015). Although new studies are necessary to explore the relation between dietary restraint and emotional self-discrepancy in men, the absence of the latter in women dieters is also relevant. It can be hypothesized that this is related to the fact that the ideal of thinness, and its achievement through dietary restraint, is usually accepted by family and friends.

Another striking finding in this study is the significantly higher discrepancy of men chronic dieters on an emotional domain, which was not observed in women dieters. Lavender and Anderson (2010) reported that difficulties in

emotion regulation are related with both disordered eating and body dissatisfaction in college men. More research is required to investigate the causes of social and emotional self-discrepancy in men while women chronic dieters appear to not have this discrepancy. Nevertheless, our results corroborate the importance of investigating the impact of self-discrepancy from the standpoints of significant others (Halliwell & Dittmar, 2006).

The dietary restraint in both men and women was not related to the frequency of consumption of foodstuffs groups, in line with Schnettler et al. (2014). However, there can be differences between men and women in the intake amount of the same food, which would explain the higher BMI in both men and women chronic dieters. Nevertheless, as in the research by Schnettler et al. (2014), in this study, differences were found in food restriction and in the reasons for such restrictions between chronic dieters and non-dieters. The amount of food reportedly restricted by women chronic dieters was higher than the amount reported by men chronic dieters. This finding is in line with Deliens et al. (2013) inasmuch as male students tend to use fewer weight management strategies compared to their female counterparts. Even though women chronic dieters reported a significantly higher restriction in the consumption of sugar, pastries, salt, pasta, rice and potatoes, which may account for a better quality of dietary intakes according to Leblanc et al. (2015), statistical differences in the restriction of these foods may be due to health problems. Therefore, it can be suggested that the restriction of these foods may relate to the higher proportion of women chronic dieters who have a regular health self-perception.

A number of limitations should be taken into account. One limitation was the non-probabilistic nature of the sample and its relatively small size, which does not allow generalization of the results to other university populations. Second, all data were self-reported. A third limitation was asking only the frequency of food consumption, without information of the nutritional contribution of the participants' diets. Lastly, the study did not inquire about the participants' specific diets that they may be undertaking nor their ideal weight. These aspects must be dealt with in future studies.

In summary, our findings indicate that university students of both genders who are chronic dieters share some characteristics and behaviors but differ in others. In both genders, chronic dieters are highly concerned with nutrition, report more mental health problems, have a higher BMI and report a higher physical and economic self-discrepancy. Regarding differences in dietary restraint by gender, women chronic dieters report less life satisfaction and satisfaction with life, and more health problems, and tend to restrict the consumption of certain foods more than men. Meanwhile, men chronic dieters have higher social and emotional self-discrepancy. Health professionals should take into account such gender-related similarities and differences among chronic dieters in the design of dietary-related prevention and intervention strategies and in clinical treatment plans.

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REFERENCES

- Ambwani, S., Slane, J. D., Thomas, K. M., Hopwood, C. J., & Grilo, C. M. (2014). Interpersonal dysfunction and affect-regulation difficulties in disordered eating among men and women. *Eating Behaviors*, 15(4), 550-554. <http://dx.doi.org/10.1016/j.eatbeh.2014.08.005>
- Bentley, C., Gratwick-Srall, K., Harrison, C., & Mond, J. (2015). Sex differences in psychosocial impairment associated with eating-disordered behavior features in adolescents: A school-based Study. *International Journal of Eating Disorders*, 48(6), 633-640. <http://dx.doi.org/10.1002/eat.22396>
- Bentley, C., Mond, C., & Rodgers, B. (2014). Sex differences in psychosocial impairment associated with eating-disordered behavior: What if there aren't any? *Eating Behaviors*, 15(4), 609-614. <http://dx.doi.org/10.1016/j.eatbeh.2014.08.015>
- Bergeron, D., & Tylka, T. L. (2007). Support for the uniqueness of body dissatisfaction from drive for muscularity among men. *Body Image*, 4, 288-295. <http://dx.doi.org/10.1016/j.bodyim.2007.05.002>
- Cain, A. S., Epler, A. J., Steinley, D., & Sher, K. J. (2012). Concerns related to eating, weight, and shape: Typologies and transitions in men during the college years. *International Journal of Eating Disorders*, 45, 768-775. <http://dx.doi.org/10.1002/eat.20945>
- Darcy, A. M., Doyle, A. C., Lock, J., Peebles, R., Doyle, P., & Le Grange, D. (2012). The eating disorders examination in adolescent males with anorexia nervosa: How does it compare to adolescent females? *International Journal of Eating Disorders*, 45, 110-114. <http://dx.doi.org/10.1002/eat.20896>
- Deliens, T., Clarys, P., Van Hecke, L., De Bourdeaudhuij, I., & Deforche, B. (2013). Changes in weight and body composition during the first semester at university. A prospective explanatory study. *Appetite*, 65, 111-116. <http://dx.doi.org/10.1016/j.appet.2013.01.024>
- Desai, K. K., & Ratneshwar, S. (2003). Consumer perceptions of product variants positioned on atypical attributes. *Journal of the Academy of Marketing Science*, 31(1), 22-35. <http://dx.doi.org/10.1177/0092070302238600>
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71-75. <http://dx.doi.org/10.1207/s15327752jpa4901.13>
- Dimitrov, D. M. (2010). Testing for factorial invariance in the context of construct validation. *Measurement and Evaluation in Counseling and Development*, 43, 121-129. <http://dx.doi.org/10.1177/0748175610373459>
- Gomez, R., Gonçalves, S., & Costa, J. (2015). Exercise, eating disordered behaviors and psychological well-being: A study with Portuguese adolescents. *Revista Latinoamericana de Psicología*, 47(1), 66-74. [http://dx.doi.org/10.1016/S0120-0534\(15\)30008-X](http://dx.doi.org/10.1016/S0120-0534(15)30008-X)
- Grunert, K., Dean, D., Raats, M., Nielsen, N., & Lumbers, M. (2007). A measure of satisfaction with food-related life. *Appetite*, 49(2), 486-493. <http://dx.doi.org/10.1016/j.appet.2007.03.010>
- Halliwell, E., & Dittmar, H. (2006). Associations between appearance-related self-discrepancies and young women's and men's affect, body satisfaction, and emotional eating: A comparison of fixed-item and participant-generated self-discrepancies. *Personality and Social Psychology Bulletin*, 32(4), 447-458. <http://dx.doi.org/10.1177/0146167205284005>
- Hennessy, C., Moriarty, D., Zack, M., Scherr, P., & Brackbill, R. (1994). Measuring health-related quality of life for public health surveillance. *Public Health Reports*, 109, 665-672. <http://dx.doi.org/10.5888/pcd10.120334>
- Herman, C. P., & Polivy, J. (1980). Restrained eating. In A. J. Stunkard (Ed.), *Obesity* (pp. 208-225). London, England: W.B. Saunders.

- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, 94(3), 319–340.
<http://dx.doi.org/10.1037//0033-295X.94.3.319>
- Lavender, J. M., & Anderson, D. (2010). Contribution of emotion regulation difficulties to disordered eating and body dissatisfaction in college men. *International Journal of Eating Disorders*, 43, 352–357. <http://dx.doi.org/10.1002/eat.20705>
- Leblanc, V., Bégin, C., Corneau, L., Dodin, S., & Lemieux, S. (2015). Gender differences in dietary intakes: What is the contribution of motivational variables? *Journal of Human Nutrition and Dietetics*, 28, 37–46.
<http://dx.doi.org/10.1111/jhn.12213>
- Luna-Arocas, R., & Quintanilla, I. (1999, September). *Symbolic consumption and self-enhancement*. Paper presented at the 1st Conference on Consumption: Consuming markets, consuming meanings, Plymouth, United Kingdom.
- Matthews, M., Zullig, K. J., Ward, R. S., Horn, T., & Huebner, E. S. (2012). An analysis of specific life satisfaction domains and disordered eating among college students. *Social Indicators Research*, 107, 55–69.
<http://dx.doi.org/10.1007/s11205-011-9826-5>
- Michellini, Y., Acuña, I., & Godoy, J. C. (2016). Emociones, toma de decisiones y consumo de alcohol en jóvenes universitarios. *Suma Psicológica*, 23(1), 42–50.
<http://dx.doi.org/10.1016/j.sumpsi.2016.01.001>
- Orellana, L., Sepúlveda, J., & Denegri, M. (2013). *Significado psicológico de comer carne, vegetarianismo y alimentación saludable en estudiantes universitarios a partir de redes semánticas naturales*. *Revista Mexicana de Trastornos Alimentarios*, 4, 15–22.
- Polivy, J., & Pliner, P. (2015). “She got more than me”. Social comparison and the social context of eating. *Appetite*, 86, 88–95. <http://dx.doi.org/10.1016/j.appet.2014.08.007>
- Provencher, V., Polivy, J., Gallander, M., Pratt, M., Pancer, M., Birnie-Lefcovitch, S., & Adams, G. (2009). Who gains or who loses weight? Psychosocial factors among first-year university students. *Physiology & Behavior*, 96, 135–141.
<http://dx.doi.org/10.1016/j.physbeh.2008.09.011>
- Quick, V. M., & Byrd-Bredbenner, C. (2013). Disturbed eating behaviours and associated psychographic characteristics of college students. *Journal of Human Nutrition and Dietetics*, 26(1), 53–63. <http://dx.doi.org/10.1111/jhn.12060>
- Remick, A. K., Pliner, P., & McLean, K. C. (2009). The relationship between restrained eating, pleasure associated with eating, and well-being re-visited. *Eating Behaviors*, 10, 42–44.
<http://dx.doi.org/10.1016/j.eatbeh.2008.11.001>
- Schnettler, B., Denegri, M., Miranda, H., Sepúlveda, J., Orellana, L., Paiva, G., & Grunert, K. G. (2013). Hábitos alimentarios y bienestar subjetivo en estudiantes universitarios del sur de Chile. *Nutrición Hospitalaria*, 28(6), 2221–2228.
<http://dx.doi.org/10.3305/nh.2013.28.6.6751>
- Schnettler, B., Miranda, H., Lobos, G., Orellana, L., Sepúlveda, J., Denegri, M., . . . , & Grunert, K. G. (2015). Eating habits and subjective well-being. A typology of students in Chilean state universities. *Appetite*, 89, 203–214.
<http://dx.doi.org/10.1016/j.appet.2015.02.008>
- Schnettler, B., Miranda, H., Sepúlveda, J., & Denegri, M. (2011). Satisfacción con la alimentación y la vida, un estudio exploratorio en estudiantes de la Universidad de La Frontera, Temuco-Chile. *Psicología & Sociedad*, 23(2), 426–435.
<http://dx.doi.org/10.1590/S0102-71822011000200024>
- Schnettler, B., Miranda, H., Sepúlveda, J., Orellana, L., Etchebarne, S., Lobos, G., . . . , & Grunert, K. G. (2014). Dietary restraint and subjective well-being in university students in Chile. *Nutrición Hospitalaria*, 30(2), 453–461.
<http://dx.doi.org/10.3305/nh.2014.30.2.7561>
- Shai, I., Shahar, D. R., Vardi, H., & Fraser, D. (2004). Selection of food items for inclusion in a newly developed food-frequency questionnaire. *Public Health Nutrition*, 7, 745–749.
<http://dx.doi.org/10.1079/PHN2004599>
- Silva, J. (2010). *Consistencia interna y validez factorial de la versión en español de la Escala Revisada de Restricción Alimentaria*. *Revista Chilena de Nutrición*, 37(1), 41–49.
- Tabler, J., & Utz, R. L. (2015). The influence of adolescent eating disorders or disordered eating behaviors on socioeconomic achievement in early adulthood. *International Journal of Eating Disorders*, 48(6), 622–632. <http://dx.doi.org/10.1002/eat.22395>
- Ting, W., Huang, C., Tu, Y., & Chien, K. (2012). Association between weight status and depressive symptoms in adolescents: Role of weight perception, weight concern, and dietary restraint. *European Journal of Pediatrics*, 171(8), 1247–1255. <http://dx.doi.org/10.1007/s00431-012-1753-1>
- Toet, J., Raat, H., & van Ameijden, E. (2006). Validation of the Dutch version of the CDC core healthy days measures in a community sample. *Quality of Life Research*, 15, 179–184.
<http://dx.doi.org/10.1007/s1136-005-8484-y>
- van der Laan, L., & Smeets, P. (2015). You are what you eat: A neuroscience perspective on consumers’ personality characteristics as determinants of eating behavior. *Current Opinion in Food Science*, 3(1), 11–18.
<http://dx.doi.org/10.1016/j.cofs.2014.11.001>
- van Strien, T., Herman, C. P., & Verheijden, M. W. (2012). Eating style, overeating, and weight gain. A prospective 2-year follow-up study in a representative Dutch sample. *Appetite*, 59, 782–789. <http://dx.doi.org/10.1016/j.appet.2012.08.009>
- Vartanian, L. (2012). Self-discrepancy theory and body image. *Encyclopedia of Body Image and Human Appearance*, 2, 711–717.
<http://dx.doi.org/10.1016/B978-0-12-384925-0.00112-7>
- Vieira, P., Silva, M., Mata, J., Coutinho, S., Santos, T., Sardinha, L., & Teixeira, P. (2013). Correlates of health-related quality of life, psychological well-being, and eating self-regulation after successful weight loss maintenance. *Journal of Behavioral Medicine*, 36, 601–610.
<http://dx.doi.org/10.1007/s10865-012-9454-9>