



## Food attitudes and well-being: The role of culture



Gloriana Rodríguez-Arauz <sup>a,\*</sup>, Nairán Ramírez-Esparza <sup>b</sup>, Vanessa Smith-Castro <sup>c</sup>

<sup>a</sup> University of Connecticut, Bousfield Psychology Building, 228, 406 Babbidge Road, U-1020, Storrs, CT, 06269, United States

<sup>b</sup> University of Connecticut, Bousfield Psychology Building, 181, 406 Babbidge Road, U-1020, Storrs, CT, 06269, United States

<sup>c</sup> Universidad de Costa Rica, Instituto de Investigaciones Psicológicas, 11501-2060, San Pedro De Montes De Oca, San José, Costa Rica

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### ABSTRACT

Previous cross-cultural studies have found differences in food attitudes. For example, Americans are more concerned about weight gain than people from France and India. This study aimed to add on the literature on cross-cultural differences in food attitudes by comparing Euro-Americans with Costa Ricans on three different food attitudes: concern about gaining weight, food negativity, and the belief in the link between diet and health. This study also analyzes the implications of food attitudes on well-being. Specifically, within and across cultures, analyses were done to test the relationship between food attitudes and both anxiety and depression. Results showed that Costa Ricans are significantly less concerned about weight and less food negative than Euro-Americans. In further analyses an interaction was revealed, in which Costa Ricans that are high on weight concern but low on food negativity show lower levels of depression, compared to Euro-Americans. Results and implications for further research are discussed.

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Eating is more than just putting food in our mouths. We often eat to feel better about ourselves, or to share leisure time with other people. As we eat, we reminisce about times, places, and people in our lives. Indeed, studies have shown that eating transcends the act of food consumption to become a vehicle for symbolism, for engaging in social interaction, and even for aesthetic expression (Rozin, 2005). The ingestion of healthy, wholesome food has been linked to feelings of pleasure and well-being (Coveney & Bunton, 2003), and the social component present in food meaning gives a sense of identity that contributes to well-being (Koenig, Dutta, Kandula, & Palaniappan, 2012).

This study had two specific goals. First, this study aimed to shed light on how attitudes about food differ in two different cultures: the United States and Costa Rica. Second, this study explored the potential difference in the association between food attitudes and

well-being in members of Euro-American<sup>1</sup> and Costa Rican cultures. Specifically, we explored how concerns about weight, negativity towards food, and beliefs about the link between diet and health relate to symptoms of depression and anxiety.

### 1. Food attitudes and culture

Although it is widely known that food intake varies by culture and geography (World Health Organization [WHO], 2002), there is less evidence on how food-related attitudes vary across cultures, and most of it examines cross-cultural comparisons between Euro-American, Western-European, and Asian samples. This research has focused on how three distinct food attitudes related to health varied cross-culturally: 1) an overall concern about gaining weight; 2) negativity towards food; and 3) general belief on effect diet has on health (Rozin, Bauer, & Catanese, 2003; Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999).

Concern about gaining weight is defined as preoccupation with weight gain and appearance, and includes related behaviors such as dieting (Rozin, Bauer et al., 2003; Rozin, Kabnick et al., 2003). High levels of concern about weight, especially among females, are common in the United States (Rozin, Bauer et al., 2003; Rozin, Kabnick et al., 2003). In a study conducted with participants from Belgium, France, Japan, and the United States, Rozin et al. (1999) reported that Americans showed the highest concerns about

\* Corresponding author. Department of Psychology, University of Connecticut, Bousfield Psychology Building, 228, 406 Babbidge Road, U-1020, Storrs, CT, 06269, United States.

E-mail addresses: [gloriana.rodriguez@uconn.edu](mailto:gloriana.rodriguez@uconn.edu) (G. Rodríguez-Arauz), [nairan.ramirez@uconn.edu](mailto:nairan.ramirez@uconn.edu) (N. Ramírez-Esparza), [vanessa.smith@ucr.ac.cr](mailto:vanessa.smith@ucr.ac.cr) (V. Smith-Castro).

<sup>1</sup> For the purposes of this study, we will consider Euro-Americans to be individuals born and raised in the United States that track their ancestry to Europe. They are usually included in the category of "White", according to the United States Census Bureau.

calorie intake, appearance, and dieting, confirming that the high levels of anxiety in America exceed those of other countries.

Food can be a powerful elicitor of both positive and negative emotions. For example, it is possible that an individual not only looks forward to the next meal (positive), but also is concerned that the food is going to end up being too fattening (negative; Tapper & Pothos, 2010). Previous research suggests that framing food as positive varies across cultures (Rozin, Kurzer, & Cohen, 2002), and that positivity towards food is often the lowest in the United States. Research examining cross-cultural differences positivity towards food in France, the United States, Japan, and Belgium, Rozin et al. (1999) found that the French scored the highest on a measure of general positivity towards food, compared to the United States. In a study that examined free associations with the word “food” by students from India, the United States, and France, Americans’ associations were more negative than positive (Rozin et al., 2002). There is also some indication that females have higher food negativity than males (Rozin, Bauer et al., 2003; Rozin, Kabnick et al., 2003).

Another food attitude of interest is the belief about the extent to which diet has an effect on health. Americans also tend to differ from other cultures on this food attitude. For example, American subjects believe that diet has a stronger effect on cancer, obesity, and heart disease than French subjects (Rozin et al., 1999), while French subjects reported believing in a weaker effect. In a separate sample, 61% of American participants endorsed a strong effect of diet on health (Rozin, Bauer et al., 2003; Rozin, Kabnick et al., 2003).

Overall, these studies suggest that there are cultural differences in food attitudes across cultures. These differences have been found when comparing developed countries (e.g., the United States and France) and undeveloped countries (e.g. India). Rozin et al. (1999), Rozin, Bauer et al. (2003) and Rozin, Kabnick et al. (2003) point out those cultural differences in food attitudes may have to do with culture-specific historical, ecological, and religious factors. For example, the French have been known over the years for an enhanced culinary focus, which emphasizes both moderation and pleasure in eating. French eating patterns are characterized by taking longer to eat a meal and the absence of snacking (Rozin et al., 1999). Portion sizes are smaller in France, and menu choices are less varied compared to the ones found in the United States (Rozin, Remick, & Fischler, 2011).

In contrast, Americans’ emphasis on worry and eating restraint may be explained in part by individualistic and religious values. In individualistic societies, the self is construed in terms of the wishes, needs, and aspirations of the individual rather than those of the group (Markus & Kitayama, 1991; Stephan, Stephan, & De Vargas, 1996). Individuals are seen as personally responsible for achieving happiness and well-being – also termed the Protestant work ethic (Quinn & Crocker, 1999). In terms of health, this leads to an emphasis on individual responsibility for staying fit and eating healthy, and attributing being overweight to a lack of individual control and self-discipline (Quinn & Crocker, 1999; Rozin et al., 2011). Further, yielding to pleasure is thought to reflect on the moral character of the individual. Hence, overweight people are seen to not only as lacking self-discipline, but also as morally inferior (Rozin et al., 2011).

Another factor shaping the American cultural view of food is the availability and variety of foods. This abundance is seen as a symbol of success. Food is readily available in most places, including retail stores, gas stations, and drug stores. The American supermarket overflows with different varieties of the same product, and restaurants overwhelm foreign visitors with increased portion sizes (Rozin et al., 2011).

Although, evidence of cross-cultural differences in food attitudes is well established for developed countries, research on how

food attitudes differ in more undeveloped, collectivist cultures is scarce. In contrast to individualistic societies, collectivist societies assert the needs of the group rather than those of the individual (Stephan et al., 1996), and the individual self is construed around the demands and aspirations of the group (Markus & Kitayama, 1991). In a collectivist society, the emphasis on personal responsibility may be diluted to the group, and food may be regarded as a means of enhancing group cohesion and membership. Previous literature examining collectivistic Latin American societies hint at this possibility.

Latin American identity may foster less emphasis on weight and eating. Studies have found that people of Latin American origin hold body image ideals distinct from those of the mainstream American culture. For Latinas, the ideal body type is thicker and curvier than the ideal for Caucasian women (Schooler & Daniels, 2014). Euro-American women score higher on measures of frequency of body checking, overall appearance checking, and specific body parts checking than Latina women (White & Warren, 2013). Additionally, Euro-American women report more avoidance of being weighed than Latina women (White & Warren, 2013). Together, these findings suggest that Latin American identity may also be tied to less weight concern and a less negative view of food.

The present study aims to expand the previous literature by comparing food attitudes of people in an individualistic culture (the United States) to those in a collectivist culture (Costa Rica). We expect Costa Ricans to exhibit a pattern similar to France, India, and people of Latino descent in the United States: less concern about weight, less food negative, and believers in a weaker link between diet and overall health than Americans. Any differences found in food attitudes have significant health implications. As an example, emphasis on excessive worry and less pleasure regarding food may influence indicators of cardiovascular disease (Rozin et al., 1999). In this investigation we include two measures of well-being with potential health implications – depression and anxiety.

## 2. Food attitudes and well-being

The majority of research on eating behavior focuses on the “pathology of eating” (Renner, Sproesser, Strohbach, & Schupp, 2012). There has been less emphasis on examining how attitudes about food can be linked to overall well-being.

There is some research on how the pleasure of eating is related to levels of psychological well-being. In a sample of dieting women, Lindeman and Stark (2000) found higher depression levels and lower self-esteem amongst those perceiving the pleasure of eating as less important. In contrast, Appleton and McGowan (2006) found that high eating restraint combined with high pleasure for eating predicted higher levels of anxiety in a sample of restrained eaters. Remick, Pliner, and McLean (2009) showed that participants who reported high pleasure for eating and higher levels of eating restraint were more likely to have a weaker sense of self and higher levels of neuroticism. Overall, these studies show that pleasure for eating alone and combined with high eating restraint can have detrimental effects on well-being.

Food preoccupation and consistency of food attitudes have also been related to psychological well-being. Fuglestad, Bruening, Graham, Eisenberg, and Neumark-Sztainer (2013) found that young college adults who cared more about healthy eating and perceived that their friends did not care about healthy eating had higher levels of depression, lower self-esteem, and lower body satisfaction (Fuglestad et al., 2013).

A final approach ties the relationship between food attitudes and well-being to culture-specific factors. Priming overweight, Euro-American women with the idea that weight is under the control of the individual and with ideals of self-discipline and

personal responsibility (part of the Protestant work ethic) can lead to lower levels of psychological well-being (Quinn & Crocker, 1999). Euro-American women with increased weight who feel they did not meet the cultural beauty ideals of thinness also show increased levels of clinical impairment (e.g., frequency of self-critical thoughts; White & Warren, 2013).

Studies with Latino participants in the United States highlight potential cultural differences in the relationship between food attitudes and well-being. After viewing images of sexualized, slim, White women, Latina adolescents who emphasized their cultural identity in a self-description used a more positive tone than those not emphasizing their Latina identity (Schooler & Daniels, 2014). These participants also pointed out being proud of not endorsing the “skinny toothpick” ideal that characterizes mainstream American images of women in the media. As a result, Schooler and Daniels (2014) posited that the salience of the Latino identity may act as a buffer of the harmful effects of unreachable body ideals.

In summary, research relating food attitudes to well-being have approached the issue from the angle of pleasure and from the angle of worry, and have examined diverse measures of well-being. As a whole, these findings indicate that more concern around eating is related to lower levels of well-being, and that higher pleasure may conflict with the desire to eat less, leading to lower well-being. Studies of specific cultural factors (e.g. Protestant work ethic, identification with Latino culture) suggest that different cultural views on weight concern and food negativity could alter the nature of these relationships.

### 3. The present study

The present study examines cultural differences in the relationship between food attitudes such as weight concern, food negativity, and beliefs about the link between food and health, and well-being (e.g., Rozin, 2005). There were three main goals. The first goal was to test if differences in food attitudes are present between two cultural groups that differ on the individualism-collectivism continuum: Euro-Americans and Costa Ricans. We expected the individualistic cultural group (Euro-Americans) to worry more about weight, have more food negativity, and hold stronger beliefs in a link between diet and overall health than the collectivistic cultural group (Costa Ricans).

The second goal aimed to test if food attitudes are related to measures of well-being across cultures. We expected higher weight concern, higher food negativity, and a stronger belief in the link between diet and health to be associated with higher levels of depressive and anxious symptoms for both Euro-Americans and Costa Ricans.

The third goal was to test the moderating effect of culture on the associations between food attitudes and measures of well-being. We performed additional analyses to test whether being from a Latin American country like Costa Rica has a protective effect on the relationship between food attitudes and well-being.

## 4. Method

### 4.1. Participants

Data were collected from 215 undergraduate psychology students at University of Connecticut in Storrs, Connecticut (48 males, 167 females) and 126 undergraduate psychology students from the University of Costa Rica in San José (42 males, 86 females). The mean age for Euro-American students was 19.00 years ( $SD = 1.14$ ), and for Costa Rican students was 20.30 years ( $SD = 3.71$ ). In both countries, data were collected in public universities, which are four-

year state-funded institutions, generally attracting lower-middle to middle class students (Gutiérrez, Kikut, Navarro, Azofeifa, & Rodríguez, 2015). Only participants who self-identified as Euro-American in the United States and as born and raised in Costa Rica were included in this study. Participants from both samples were asked to report height and weight to enable the calculation of Body Mass Index (BMI). Euro-Americans had a mean BMI of 23.08, ( $SD = 4.74$ ), and Costa Ricans had a mean BMI of 22.48 ( $SD = 3.93$ ). These two values fall within the range of a normal BMI (18.5–24.9) according to the Centers for Disease Control and Prevention (CDC, 2014).

### 4.2. Procedure

Students at the University of Connecticut were recruited online through the Psychology participant pool system, and completed an online survey in exchange for research credit. Students at the University of Costa Rica were contacted by their instructors and invited to participate. If they agreed to participate, they were given the opportunity to complete the online survey in the location of their choosing. Most received some form of course credit for their participation.

### 4.3. Measures

All materials were translated into Spanish by a Costa Rican and back-translated into English by a Euro-American (Brislin, 1980).

#### 4.3.1. Weight concern

This measure was a subscale from a broader, 57-item questionnaire developed by Rozin, Bauer, et al. (2003) and Rozin, Kabnick, et al. (2003). The weight concern measure has 18 items with different response formats: frequency (e.g., never, rarely, sometimes, often, almost always), yes-no, word choices, etc. Sample items of this measure include “I am currently on a diet,” and “I am concerned about my weight.” Cronbach’s alphas for weight concern were 0.88 for both Euro-Americans and Costa Ricans.

#### 4.3.2. Food negativity

Food negativity was measured using a subscale of the Food Preoccupation scale developed by Tapper and Pothos (2010). This measure is comprised of 11 items about negative feelings associated with eating. Sample items include “I think I love food” (reverse-scored), and “I hate to be distracted by thoughts about food.” The response format was a Likert scale ranging from 1 = completely disagree to 5 = completely agree. Cronbach’s alphas were 0.91 for Euro-Americans and 0.88 for Costa Ricans.

#### 4.3.3. Link between diet and health

This measure asked the question “How much of an effect you think diet has on ...” four different conditions: 1) heart disease; 2) good health; 3) obesity, and 4) cancer. The response format was a Likert scale ranging from 1 = no effect to 4 = strong effect. Cronbach’s alphas for link between diet and health were 0.65 for Euro-Americans and 0.62 for Costa Ricans.

#### 4.3.4. Depression

The Depression Scale of the Center for Epidemiological Studies (CES-D; Radloff, 1977) was used as a measure of well-being. This scale includes 20 items that reflect six dimensions of depression: depressed mood, feelings of guilt and worthlessness, feelings of hopelessness and helplessness, psychomotor retardation, loss of appetite, and sleep disorders. The scale asks for the frequency of these symptoms on a four-point Likert scale ranging from 0 = rarely or never to 4 = most of the time. Cronbach’s alphas were 0.93 for

both Euro-Americans and Costa Ricans.

#### 4.3.5. Anxiety

The State Anxiety Inventory (STAI; Barnes, Harp, & Jung, 2002) was used as a measure of anxiety symptoms. This measure asks about general anxiety in daily life, or how one “generally feels.” Sample items include “I feel nervous and restless,” and “I feel that I lack confidence in myself.” Response format is in a 4-point Likert scale ranging from 1 = almost never to 4 = almost always. Cronbach’s alphas were 0.94 for Euro-Americans and 0.93 for Costa Ricans.

#### 4.3.6. Body Mass Index (BMI)

BMI is considered to be one of the most reliable measures of body fatness (CDC, 2014). BMI is calculated using measures of height and weight, and is utilized widely to identify the existence of overweight and obesity. Participants in the United States were asked to estimate their weight in pounds and height in feet. In Costa Rica, participants were asked to estimate weight in kilograms and height in centimeters. BMI calculation followed the formula given by the World Health Organization: dividing weight in kilos by height in meters squared.

#### 4.4. Data analysis

In order to analyze the data, we followed the procedure from Rozin, Bauer, et al. (2003) and Rozin, Kabnick, et al. (2003). Essentially, both the measures of weight concern and the link between diet and health were transformed to range from 0 to 1 since items within these scales used different scales. For example, those items that were a yes and no answer were left as 0 and 1 answer respectively, however those items with a 4-point scale were converted to scores of 0, 0.25, 0.50, 0.75, and 1. The last step was to average all the items that belonged to each scale.

A series of mean comparison and regression analyses were conducted to test study hypotheses. All variables used in regression analyses were mean-centered. Independent samples t-tests were used to test for cross-cultural differences in food attitudes. Point bi-serial correlational analyses were run to determine the relationship between food attitudes and measures of well-being, controlling for gender and BMI. Hierarchical, moderated, multiple regression analyses were run to test for differences in the relationship between food attitudes and well-being in each culture.

## 5. Results

### 5.1. Do food attitudes differ across the United States and Costa Rica?

To test whether food attitudes vary by country, a series of independent samples t-tests were conducted on weight concern, food negativity, and beliefs about the link between health and diet. Fig. 1 shows that, in accordance with our expectations, Costa Ricans were significantly less concerned about their weight,  $t(336) = 2.74$ ,  $p < 0.01$ , and significantly less negative towards the food they eat,  $t(337) = 3.76$ ,  $p < 0.001$ , than Americans. Contrary to our expectations, no significant differences were found regarding beliefs about the link between diet and health  $t(339) = -0.23$ , *ns*. See Table 1 for means and standard deviations.

### 5.2. Do food attitudes relate to well-being?

Before analyzing the relationship between food attitudes and well-being we performed a series of Pearson correlations between the three food attitudes (weight concern, food negativity and the link between diet and health) and the two measures of well-being

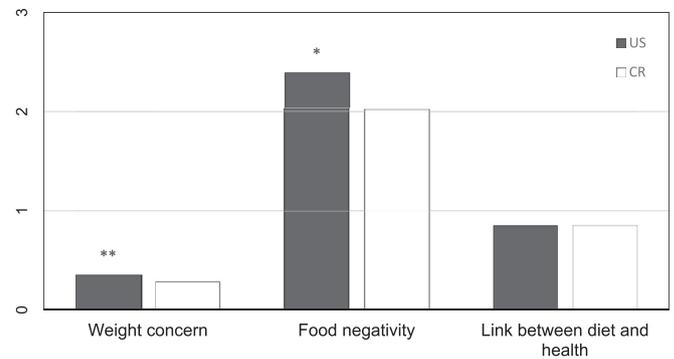


Fig. 1. Mean weight concern, food negativity and link between diet and health by country. Note: \* $p = 0.001$ , \*\* $p < 0.01$ .

(depression and anxiety) with BMI. A series of point bi-serial correlation analyses was performed between measures of food attitudes, well-being, and gender. We did these correlations because BMI and gender can be strongly correlated with the independent and dependent variables of this study, potentially confounding results (Rozin, Bauer et al., 2003; Rozin, Kabnick et al., 2003). As Table 1 shows, correlations were positive and significant for weight concern with BMI and gender for both countries. Gender correlated significantly with anxiety in Euro-Americans, and BMI correlated positively and significantly with both depression and anxiety in Costa Ricans. We controlled BMI and gender in all subsequent analyses.

To test whether food attitudes were related to measures of depression and anxiety above and beyond the influences of gender and BMI, a series of first-order partial correlation analyses were run. As shown in Table 2, partial correlations of weight concern and food negativity with depression and anxiety were positive and significant, above and beyond the influence of gender and BMI for both Euro-Americans and Costa Ricans. In other words, when people are more concerned about how much they weigh and are more negative towards the food they eat, they tend to show increased symptoms of depression and anxiety in both cultures. Correlations between beliefs about the link of diet to health and both depression and anxiety were negative and significant only in Euro-Americans. In other words, Euro-Americans who believe that diet has a strong effect on health report fewer symptoms of depression and anxiety.

### 5.3. Does culture moderate the relationship between health and well-being?

To explore if culture moderated the effects of food attitudes on well-being, a series of hierarchical, moderated regression analyses were run on the two food attitudes that differed across cultures (i.e., weight concern and food negativity). Gender and BMI were used as controls in these analyses. Binary predictors, including country and gender, were dummy coded. The continuous predictors were centered around their means (subtracting each data point from the mean of each predictor) to allow meaningful interpretation. Two independent analyses were done for depression and anxiety.

#### 5.3.1. Depression

Variables were entered in a series of models (See Table 3). In Model 1, the control variables of BMI and gender were added. In Model 2, the individual predictors (weight concern, food negativity, and country) were added. In Model 3, the three two-way interactions were added: a) weight concern and food negativity, b)

**Table 1**  
Mean values and correlations between weight concern, food negativity, anxiety and depression with BMI and gender, by country.

	United States			Costa Rica		
	Mean (SD)	BMI	Gender	Mean (SD)	BMI	Gender
		r (N)	r (N)		r (N)	r (N)
<i>Dependent variables</i>						
Depression	17.11(11.55)	0.02 (209)	0.12 (211)	16.7(11.7)	0.22* (115)	−0.07 (118)
Anxiety	42.90(12.04)	0.05 (200)	0.17* (203)	42.62(11.69)	0.24* (117)	0.01 (120)
<i>Independent variables</i>						
Weight concern	0.36(0.24)	0.40** (211)	0.27** (214)	0.29(0.23)	0.37** (119)	0.23* (122)
Food negativity	2.40(0.87)	0.12 (209)	0.11 (212)	2.02(0.87)	0.17 (120)	0.15 (123)
Link between diet and health	0.85(0.13)	0.08 (209)	0.03 (212)	0.86(0.13)	0.04 (123)	0.01 (116)

Note. \*\* $p < 0.001$ , \* $p < 0.05$ ; BMI = Body Mass Index, N = sample size; SD = Standard Deviation.

**Table 2**  
Partial correlations among weight concern, food negativity, link between diet and health, anxiety and depression, controlling for Body Mass Index (BMI) and gender by country.

	Depression	Anxiety
<i>United States</i>		
	N = 186	N = 186
Weight concern	0.37**	0.41**
Food negativity	0.40**	0.47**
Link between diet and health	−0.15*	−0.20*
<i>Costa Rica</i>		
	N = 102	N = 102
Weight concern	0.35**	0.42**
Food negativity	0.51**	0.51**
Link between diet and health	0.01	−0.04

Notes: \*\* $p < 0.001$ , \* $p < 0.05$ .

**Table 3**  
Summary of hierarchical regression analysis for variables predicting depression (United States N = 215, Costa Rica N = 126).

Variable	Model 1			Model 2			Model 3			Model 4		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$	B	SE(B)	$\beta$
Gender	−1.77	1.47	−0.07	1.48	1.45	0.06	1.61	1.46	0.06	1.66	0.87	0.06
BMI	0.30	0.15	0.11*	−0.09	0.16	−0.32	−0.09	0.16	−0.03*	−0.10	1.45	−0.04
Weight concern (WC)				9.17	3.34	0.19**	8.80	4.01	0.18***	10.39	0.16	0.21*
Food negativity (FN)				4.90	0.81	0.37***	4.44	1	0.33	4.51	4.07	0.34***
Country (C)				1.93	1.25	0.08	1.86	1.27	0.08	0.43	1	0.02
WC × FN							2.56	2.68	0.05	−1.56	1.46	−0.03
WC × C							−1.07	1.72	−0.01	0.41	1.75	−0.04
FN × C							1.02	6.36	0.05	−3.58	6.46	0.02
WC × FN × C										10.79	5.48	0.15+
R <sup>2</sup>		0.01			0.22			0.23			0.24	
F for change in R <sup>2</sup>		2.39			17.73***			11.20***			10.48***	

Note: Weight concern and food negativity were centered at their means. Gender and country were dummy coded as appropriate.

+ $p = 0.05$  \* $p < 0.05$ . \*\* $p < 0.01$ . \*\*\* $p < 0.001$ .

weight concern and country, and c) food negativity and country. In Model 4, a three-way interaction between the predictors (weight concern and food negativity) and country was added.

Results showed significant main effects of weight concern and food negativity on depression,  $R^2 = 0.22$ ,  $F(5, 309) = 17.73$ ,  $p < 0.001$ . The two-way interactions between the predictors and country were not significant,  $\beta = -0.01$ , ns;  $\beta = 0.05$ , ns. The three-way interaction was significant when predicting depression,  $\beta = 0.15$ ,  $p < 0.05$ , and accounted for a significant amount of variance in the case of depression  $\Delta R^2 = 0.01$ ,  $F(9, 305) = 10.48$ ,  $p < 0.01$ .

To further explore this three-way interaction, a hierarchical, moderated multiple regression analysis was run separately for Euro-Americans and Costa Ricans predicting depression. In Model 1, the controls of gender and BMI were introduced. In Model 2, depression was predicted from weight concern and food negativity.

The interaction between weight concern and food negativity was added in Model 3, and it accounted for a significant increment in variance in Costa Ricans,  $\Delta R^2 = 0.03$ ,  $F(5, 104) = 10.04$ ,  $p < 0.01$  (see Table 4), but not for Euro-Americans  $\Delta R^2 = 0.01$ ,  $F(5, 199) = 10.8$ , ns.

As weight concern increased, depression levels increased, but increased less rapidly for Costa Ricans with low food negativity (Fig. 2). The same trend was not observed in Euro-Americans (Fig. 3). That is, Costa Ricans can be concerned about their weight, but if they are more positive about their food, they can potentially show lower levels of depression.

However, this trend was not confirmed by simple slopes analyses which showed that at low levels of food negativity, weight concern did not significantly predict depression,  $b = -4.71$ ,  $t(104) = -0.53$ , ns. At high levels of food negativity, weight concern

significantly predicted depression  $b = 12.21$ ,  $t(104) = 2.33$ ,  $p < 0.05$ . These results show a potentially interesting relationship of food attitudes and depression levels for Costa Ricans.

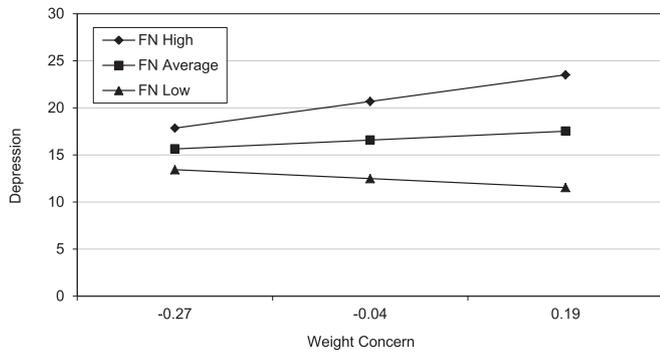
### 5.3.2. Anxiety

Variables were entered in the same series of models used when predicting depression (see Table 5). Main effects for weight concern, food negativity, and country were found in the case of anxiety,  $R^2 = 0.29$ ,  $F(5, 302) = 24.92$ ,  $p < 0.001$ . Two-way interactions between the predictors and country were not significant,  $\beta = 0.04$ , ns;  $\beta = 0.12$ , ns. The three-way interaction between the predictors and culture was not significant,  $\beta = 0.05$ , ns. Since the interaction was not significant, no further analyses were conducted.

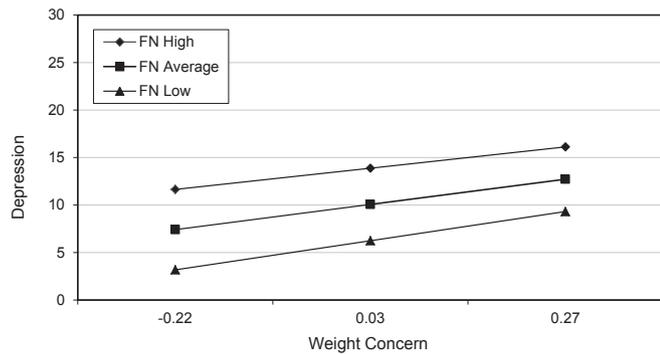
**Table 4**  
Summary of hierarchical regression analysis for variables predicting depression for Costa Ricans (N = 126).

Variable	Model 1			Model 2			Model 3		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$
Gender	0.36	2.37	0.01	4.48	2.32	0.17*	4.83	2.28	0.19
BMI	0.52	0.22	0.22*	0.12	0.22	0.05	0.10	0.25	0.04
Weight concern (WC)				7.40	5.69	0.14	6.25	5.60	0.12
Food negativity (FN)				4.89	1.36	0.43**	5.09	1.39	0.38**
WC $\times$ FN							9.44	4.19	0.20*
R <sup>2</sup>		0.04			0.29			0.32	
F for change in R <sup>2</sup>		2.87			10.86**			10.04**	

Notes: Weight concern and food negativity were centered at their means. Gender was dummy coded as appropriate.  
\*p < 0.05. \*\*p < 0.001.



**Fig. 2.** Interaction between weight concern and food negativity when predicting depression in Costa Ricans. Note: FN = Food Negativity.



**Fig. 3.** Interaction between weight concern and food negativity when predicting depression in Euro-Americans. Note: FN = Food Negativity.

**6. Discussion**

The main goal of this study was to investigate cultural differences in food attitudes and the relationship between these attitudes and well-being within and across cultures. To test this idea we recruited participants from the United States and Costa Rica and examined mean differences on three main attitudes: weight concern, food negativity, and the link between diet and health. Furthermore, we correlated these three attitudes with measures of well-being for both cultures, controlling for BMI and gender. Finally, we performed moderated regression analyses to see if culture moderates the relationship between attitudes and well-being. Next, we discuss our findings according to each of our three goals.

**6.1. Food attitude differences between the United States and Costa Rica**

Our results are in line with has been found in the cross-cultural studies on food attitudes conducted by Rozin et al. (1999), Rozin, Bauer et al. (2003) and Rozin, Kabnick et al. (2003). Taking the United States as a comparison group, other cultures seem to be significantly less negative about the food they eat and significantly less concerned about their weight. Based on these findings, we expected that Costa Ricans would be significantly less worried about their weight, less negative towards food, and report believing in a weaker link between diet and health than their Euro-American counterparts. Our results provided support for our hypothesis in two food attitudes only. Specifically, we found that Costa Ricans were in fact less worried about weight and less food-negative than Euro-Americans, but their perception of the link between diet and health did not differ. A possible explanation for these findings may

**Table 5**  
Summary of hierarchical regression analysis for variables predicting anxiety (United States N = 215, Costa Rica N = 126).

Variable	Model 1			Model 2			Model 3			Model 4		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$	B	SE(B)	$\beta$
Gender	-3.69	1.58	0.13*	0.31	1.49	0.01	0.34	1.51	0.01	0.35	1.51	0.01
BMI	0.41	0.16	0.14*	-0.04	0.16	-0.02	-0.05	0.16	-0.02	-0.05	0.16	-0.02
Weight concern (WC)				12.94	3.38	0.26***	11.95	4.11	0.24**	12.48	0.16	0.25**
Food negativity (FN)				4.90	0.83	0.36***	5.08	1.04	0.37***	5.13	1.05	0.37***
Country (C)				1.93	1.25	0.12*	2.61	1.28	0.10*	2.11	1.48	0.08
WC $\times$ FN							1.89	2.68	0.04	0.47	3.44	0.01
WC $\times$ C							1.42	6.36	0.12	0.55	6.50	0.01
FN $\times$ C							-0.22	1.73	-0.01	-0.44	1.76	-0.02
WC $\times$ FN $\times$ C										3.65	5.52	0.05
R <sup>2</sup>		0.03			0.29			0.29			0.29	
F for change in R <sup>2</sup>		5.33**			24.92***			15.52***			13.81***	

Notes: Weight concern and food negativity were centered at their means. Gender and country were dummy coded as appropriate.  
\*p < 0.05. \*\*p < 0.01. \*\*\*p < 0.0001.

be the categorization of these cultures either as individualistic or collectivistic.

As [Rozin, Bauer, et al. \(2003\)](#) and [Rozin, Kabnick, et al. \(2003\)](#) pointed out, the individualistic character of American culture and the philosophical system that underlies its society may explain the culture of worry about weight and negativity around food. Americans' strong emphasis on individuality leads to the belief that it is an individual's responsibility to eat correctly and remain fit. If the individual fails, he or she is deemed irresponsible and is blamed. The Protestant work ethic states that an individual's lack of success is due to lack of self-discipline and over indulgence ([Quinn & Crocker, 1999](#)). [Rozin, Bauer, et al. \(2003\)](#) and [Rozin, Kabnick, et al. \(2003\)](#) also suggested that this "fat phobia" is connected to the Protestant work ethic, since being fat is attributed to a lack of self-control. Accordingly, Americans have attached a substantial moral component to health, dieting, and fat. Such a view is supported by [Quinn and Crocker \(1999\)](#), who proposed that the Protestant work ethic may make overweight women more vulnerable to lower well-being.

Cultures like Costa Rica have been categorized as collectivistic. In these cultures, individuals belong to in-groups or collectives where members look after each other in exchange for loyalty ([Hofstede, 1991](#)). Collectivism in Latin America is characterized by a preeminence of the family as the most important facet of everyday life and as the major source of emotional comfort and support ([Smith-Morris, Morales-Campos, Castañeda-Alvarez, & Tuner, 2012](#)). A primacy of social interactions has also been observed in Latin American countries like Mexico, where people enjoy being around others, and being friendly and outgoing, more so than Americans ([Ramírez-Esparza, Mehl, Álvarez-Bermúdez, & Pennebaker, 2009](#)). One can infer that in collectivistic cultures, food may be regarded in a more positive way because it facilitates social interactions and enhances the benefits of others' company.

More recent studies also point to the tendency for low weight concern and low food negativity in people of Latin American descent. Latina women engage in behaviors that signal less weight concern ([White & Warren, 2013](#)), and they prefer a curvier body ideal ([Schooler & Daniels, 2014](#)). These views may indicate a less restrictive view of weight gain, along with a less negative view of food.

Contrary to our expectations, both countries did not differ in their perception of the link between diet and health. One possible explanation is that there is a highly globalized message on the harmful effects an unhealthy diet can have on health, thanks to mainstream media and wide-spread messages of key organizations like the WHO ([Borra & Bouchoux, 2009](#)). Additionally, Cronbach's alphas for this variable were lower than the Cronbach's alphas of the other variables tested. Further investigation with additional assessments is required to compare this food attitude across cultures.

### 6.2. Food attitudes and well-being

We expected that the three food attitudes (i.e. weight concern, food negativity and the link between diet and health) would relate positively to levels of anxiety and depression in both cultures. These relationships were supported by our data. Weight concern and food negativity are in fact positively related to depression and anxiety in both countries, above and beyond the influence of BMI and gender. This means that, for both Euro-Americans and Costa Ricans, higher levels of weight concern and food negativity are related to higher levels of depression and anxiety. However, this is not the case for the link between diet and health. This attitude showed significant negative relationships with depression and anxiety in Euro-Americans, but showed no relationship in Costa

Ricans.

Our findings that weight concern and food negativity relate positively to anxiety and depression are in line with previous studies ([Appleton & McGowan, 2006](#); [Remick et al., 2009](#)): when participants show less concern with what they eat and are less negative towards food, they tend to show increased well-being. However, the role a stronger link between diet and health plays in the well-being of Americans is unclear. One possibility is that the belief that diet has a strong effect on health primes a sense of control over health outcomes, which provides psychological benefits ([Quinn & Crocker, 1999](#)). Past evidence shows that an increased sense of control over one's situation is related to increased psychological well-being ([Miller & Seligman, 1975](#)). This explanation has to be considered cautiously, since Cronbach's alphas for this dimension were low in both cultures.

### 6.3. The moderating role of culture on the relationship between food attitudes and well-being

In this study we performed additional analyses to observe if being from a collectivistic culture like Costa Rica has a protective effect on the relationship between food attitudes and well-being. We expected this to happen because Costa Ricans showed lower levels of weight concern and food negativity, and this potentially could be related to increased well-being. Our results provide no support for this hypothesis. However, an interesting trend was revealed. Specifically, Euro-Americans who are very concerned about their weight (e.g., counting calories and watching what they eat to a significant extent), even if they view their food in a more positive light, still feel more depressed. Costa Ricans may be also very concerned about their weight, but if they view food more positively this weight concern is not associated with higher depression. For example, a Costa Rican may be currently on a diet and concerned about caloric intake, but if he or she looks forwards to meals and likes thinking about food, he or she will be less depressed than an American in the same situation. This speaks to the potentially moderating effects of culture on the relationship between how we view food and weight and how we generally feel. However, this finding requires further replication. In the case of anxiety, there was no significant interaction between the two food attitudes for either country.

Again, a possible explanation for the different relationships between food attitudes and well-being can be found in individualistic and collectivistic values. The trend found in our study provides initial support for the claim made by [Rozin et al. \(1999\)](#): a culture based on worry and preoccupation with weight and food can have detrimental effects on well-being. Previous evidence provides some reasons why higher levels of these attitudes can be harmful to well-being. [Quinn and Crocker's \(1999\)](#) study concludes that the priming of Protestant work ethic ideals is tied to experiences of lower self-value and increased depressive symptoms.

More recent studies may provide support for the idea that culture can act as moderator of the relationship between food attitudes and well-being. [White & Warren \(2013\)](#) concluded that increased body checking and more avoidance behaviors found in Euro-American women are related to higher measures of psychological impairment. [Schooler and Daniels \(2014\)](#) conclude that Latina's rejection of the mainstream ideal body, along with the salience of cultural identity, is related to a sense of content with one's body. These feelings can be categorized as enhanced well-being. Again, such an association deserves further exploration.

### 6.4. Limitations and future research

The findings of this study should be considered in light of a

number of limitations. This study used a sample of college students considered to be similar between the two countries, and this limits the generalizability of our results to other populations. Additionally, self-reports are limited in cross-cultural research, since they may fail to tap into attitudes and behaviors that are specific to each culture (Ramírez-Esparza et al., 2009), and they can't escape the problems inherent to translation (Brislin, 1980). This is a potential explanation for the low reliability of the measure for the link between diet and health. The limitation of self-reports is especially relevant in the case of BMI. Past research has shown that respondents tend to overestimate height and underestimate weight (Elgar & Stewart, 2008).

Another limitation of this study has to do with the nature of weight concern and food negativity. We tapped into these general attitudes in our study, but a more thorough evaluation of their prevalence and specificity is in order. In addition, it is also important to consider that food negativity and weight concern can be confounded with the overall negativity found in depression and the overall worry found in anxiety. For example, it is uncertain if the overall negativity of depression is causing people to be more concerned about weight and more negative towards food, rather than the reverse. Hence, caution has to be taken on the directionality of the relationships reported by this paper. It is also worth mentioning that actual eating behaviors have to be analyzed in order to make more accurate claims about the levels of concern around weight that each culture exhibits. As a final limitation, we must emphasize the preliminary nature of our findings regarding the moderating effects of culture in the effect of food attitudes on depression. Certainly a replication in order, with bigger sample size and better control of measurement issues.

Despite these limitations, the results of this study have important implications for future research efforts. The results may suggest that promotion of a culture that is less worried about weight and more positive around food can have more positive effects for well-being. Such a promotion can be paired with more mindful and healthy ways of eating and assessing one's weight. For example, mindful eating has been shown to be a successful intervention for adequate weight management and healthy eating (Jordan, Wang, Donatoni, & Meier, 2014). This intervention calls for a focus on the present experience of eating and the embracement of this experience without judgments. Can pleasure for eating and less concern about weight be paired with these principles to promote a healthier approach to food in general? This question has yet to be answered.

Another issue that deserves further exploration is the role that other moderators play when people evaluate their weight, food, and how they generally feel. One of those possible moderators is social interaction. As previously noted, past research has documented that people from Euro-American and Latin American descent differ in how sociable they are (Ramírez-Esparza et al., 2009). It is possible that the different nature of these interactions buffers (or not) how concerned Euro-Americans and Costa Ricans are about food and weight, and how they generally feel.

Another moderator that may affect the relationship between food attitudes and well-being include each country's specific food environment. For example, Rozin, Bauer, et al. (2003) and Rozin, Kabnick, et al. (2003) found that, in France, portion sizes are smaller and the variety of the same food product is limited (Rozin, Fischler, Shields, & Masson, 2006). It remains to be seen if these environmental factors play a role in Latin American cultures like Costa Rica.

## 7. Conclusions

This study found that the United States and Costa Rica differ in

two main food attitudes: concern about weight and food negativity. Specifically, Costa Ricans were found to be less concerned about their weight and less negative towards food than Euro-Americans. Additionally, this study found a trend in which Costa Ricans with high weight concern and low food negativity are less depressed, compared to Euro-Americans.

This study demonstrates the importance of considering culture as a major factor in attitudes regarding food. The study also aimed to provide support for the potentially moderating role culture has on the relationship between food attitudes and well-being. Further research is needed to provide additional support for this claim. Further exploration is also needed to understand what specific factors of food culture may shape this relationship.

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