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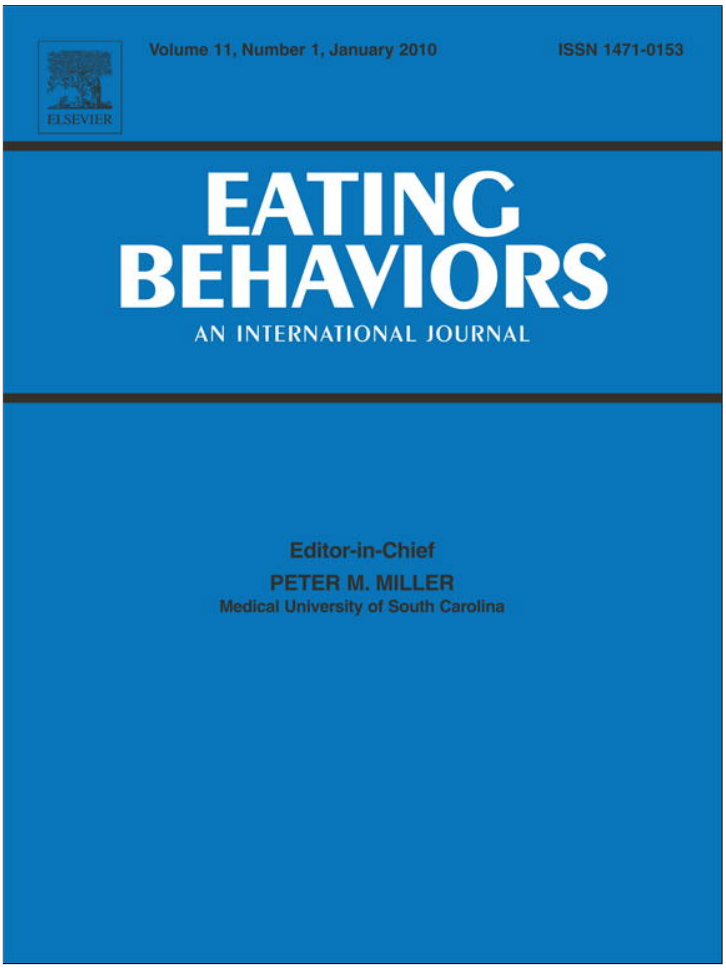

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Correlates of weight concern and control in a Hispanic college student sample

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ABSTRACT

This study examined the relationships between weight concern and control and theoretically and empirically relevant correlates in a Hispanic college student sample. Participants were 163 Hispanic college students who completed measures assessing demographics, willingness to put health at risk to lose weight, unhealthy weight loss methods, acculturation, body weight and fitness happiness and importance, and sociocultural attitudes toward appearance. Body mass index was also assessed. Females internalized sociocultural attitudes toward appearance more and found personal attractiveness more important than males, while males were less happy with their personal attractiveness. Internalization of sociocultural attitudes toward appearance and BMI predicted the degree to which individuals were willing to put their health at risk to lose weight. The previous factors, as well as the importance of body weight and fitness and being female, were significant predictors of number of unhealthy weight loss methods employed to lose weight. These data indicate that within a Hispanic college student population, weight concern and control issues are relevant considerations for future studies and the development and assessment of weight loss interventions.

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1. Introduction

Hispanics represent the fastest growing minority group in the United States (United States Census Bureau, 2006), and their rates of obesity are higher than for the general U.S. adult population (37% Mexican American; 32% U.S. adults; Ogden et al., 2006). Health problems associated with obesity include: hypertension, high cholesterol, diabetes, heart disease, stroke, cancer, sleep apnea, and other respiratory problems (Centers for Disease Control, 2004), and cardiovascular risk has been positively correlated with body mass in both Hispanic males and females (Koutoubi & Huffman, 2005). In addition, Mexican/Mexican American women have weight misperceptions (Dorsey, Eberhardt, & Ogden, 2009), hold attitudes (Unikel, Aguilar, & Gómez-Peresmitré, 2005) and engage in behaviors (e.g., fasting, excessively exercising; Lester & Petrie, 1998) that could potentially lead to the development of unhealthy eating behaviors. Further, rates of disordered eating in Mexican American female college students appear to be even higher than those found in the general population (Lester & Petrie, 1998). Similar studies in male college students, particularly those of Hispanic origin, are lacking. As such, assessing correlates of weight concern and control in a Hispanic college sample comprised of both males and females is needed. Moreover, the association of acculturation to weight concern and control is of particular interest in a Hispanic population.

1.1. Weight concern

Weight concern, such as reduced satisfaction with appearance, is related to higher Body Mass Index (BMI) in females but often not males (Sira, 2005). Further, females, including those who exercise regularly, appear to have lower self-esteem and less body satisfaction than males (Lowery et al., 2005). Yet, in considering body image satisfaction in college students, males who were exposed to brief images of muscular male models showed a decrease in their self-rated body satisfaction (Lorenzen, Grieve, & Thomas, 2004), which suggests that males may be influenced by sociocultural attitudes toward appearance, though in a manner qualitatively different from females. Still, evidence suggests that for college students of both genders, there is some degree of sociocultural influence on appearance perceptions. For females, these perceptions of weight are known to vary under different circumstances (e.g., affective state, seeing a thin woman, situations where the body is a point of focus), while males' perceptions have been less well explored (Roth & Armstrong, 1993), though media influence may impact satisfaction (Sira, 2005).

1.2. Unhealthy weight control

Weight concerns and perception (and misperception) are often associated with weight loss behaviors (e.g., Eisenberg, Neumark-Sztainer, Story, & Perry, 2005). For example, those who perceive themselves as overweight, regardless of actual BMI, are more likely to engage in weight loss behaviors (Lee et al., 2005) and may be at risk for future disordered eating (Cash, Morrow, Hrabosky, & Perry, 2004). Unhealthy weight control behaviors appear to occur at non-trivial

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rates in both genders, college students, and individuals of Hispanic descent. In a study of low income women, 15% used diet pills, and 4.3% purged (e.g., vomiting, laxative use) to control weight (Breitkopf & Berenson, 2004). Among college females, 13% reported restricting food intake, 17% reported vomiting, and 5% reported laxative use in order to lose weight (Schwitzer, Rodriguez, Thomas, & Salimi, 2001). Similarly, 51% of Non-Hispanic White college student males and females reported using cigarettes to control appetite (Camp, Klesges, & Relyea, 1993), and in both adolescent males and females, higher levels of weight concern were associated with an increased risk for lifetime smoking in Hispanics relative to Non-Hispanic Whites (Weiss, Merrill, & Gritz, 2007). Further in a U.S. sample of adults, use of dietary supplements was more common among Hispanics relative to Non-Hispanic Whites (Pillitteri et al., 2008). Although in a recent community sample assessment, approximately 6% of Hispanic women endorsed behaviors such as vigorous exercise, restricting food intake, fasting, and purging in order to lose weight (Marcus, Bromberger, Wei, Brown, & Kravitz, 2007), an assessment of weight control in college students demonstrated a significant percentage of Hispanics reported dieting, exercising, and using weight loss pills to lose weight, though the degree of such practices was not measured (George & Johnson, 2001). In a recent study on the U.S./México border, Hispanic college females exercised more frequently relative to Non-Hispanic White females; however, among all participants, high levels of unhealthy weight control behaviors (e.g., skipping and fasting (76%); binging (46%)) were observed, with no significant differences between ethnocultural groups (Shamaley-Kornatz, Smith, & Tomaka, 2007). However, once again, it should be noted that the extant literature on Hispanic weight concern and control, particularly in males, is severely limited.

1.3. Acculturation and weight concern and control

In addition to the dearth of weight related literature in Hispanic males, consideration of acculturation in relation to weight concern and control is, at present, lacking. The Acculturative Stress Model suggests that in order to cope with the stress that is involved in acculturating to a target culture, one develops coping skills that allow functioning within the unfamiliar culture (Berry, 1970). This stress can lead some to adopt unhealthy aspects of the host culture, such as poor eating habits (Berry, 1970, 2006). Indeed, Hispanic adolescents at lower levels of acculturation have demonstrated greater body dissatisfaction yet lower risk of engaging in disordered eating behaviors (Ayala, Mickens, Galindo, & Elder, 2007). In addition, higher levels of acculturation have been associated with reports of control of eating and perceived pressure to gain weight (Chamorro & Flores-Ortiz, 2000) yet higher BMI (Hubert, Snider, & Winkleby, 2005), suggesting that the interplay between acculturation, weight concern, and weight control is complex. However, studies which rely on ethnic identification as information regarding acculturation are limiting in that they do not permit consideration of highly acculturated ethnic minorities. As such, acculturation may indeed affect body and weight perceptions, but this may not directly follow ethnic categorization often employed in other studies of weight concern and control.

1.4. Aims and hypotheses

The present study is an assessment of the correlates of Hispanic college students' willingness to put health at risk to lose weight and the use of unhealthy weight loss methods. A variety of theoretically and empirically relevant variables were examined including acculturation, gender, body weight and fitness happiness and importance, internalization of sociocultural attitudes toward appearance, and BMI. It was hypothesized that higher levels of acculturation, higher levels of body weight and fitness importance, higher levels of internalization of sociocultural attitudes toward appearance, higher BMI, and lower levels of body weight and fitness happiness and female gender were associated with willingness to put health at risk to lose weight and the number of previously used unhealthy weight loss behaviors.

2. Methods

2.1. Participants

Participants ($N = 163$) were recruited from Introduction to Psychology classes at a university on the border of Texas and México. Criteria for inclusion were being 18 years or older and of Hispanic descent. Exclusion criteria would have been necessary with regard to potential medical or physical conditions that would have prohibited individuals from having body composition analyzed via imperceptible electrical impulses through the feet; however, none of the participants reported such conditions. Those who wanted to participate and met inclusion criteria could sign up for the study online for prearranged appointments.

2.2. Measures

Sociodemographic information was gathered, such as age, gender, and ethnicity.

2.2.1. Willingness to put health at risk

To assess willingness to put health at risk to lose weight, participants were asked how much they agreed with the following statement: “I would be willing to put my health at risk if it meant I could lose weight.” The response options for this question were on a Likert type scale and ranged from 1 “completely disagree” to 5 “completely agree.”

2.2.2. Unhealthy weight loss methods

Participants were also asked which potentially unhealthy weight loss methods they employed if they had ever attempted to lose weight. Possible responses included: smoking cigarettes, restricting food intake, laxatives, purging, meal replacements (i.e. shakes, bars, etc.), appetite suppressants (i.e. pills), supplements (i.e. metabolism enhancers, vitamins, “fat blockers,” etc.), fad diets (i.e. low-carb, no carb, consuming only one type of food, etc.), and surgery (i.e. gastric bypass, liposuction, etc.). The unhealthy weight loss methods variable was created by summing the number of unhealthy weight loss behaviors participants responded to using to lose weight (possible range = 0 to 9 converted to 0, 1, 2, 3 or more for ordinal regression).

2.2.3. Acculturation

Acculturation was measured using the Short Acculturation Scale for Hispanics (SASH) developed by Marín, Sabogal, Marín, Otero-Sabogal, and Perez-Stable (1987). The scale contains 12 items assessing the degree to which people of Hispanic descent have adopted American culture. This scale measures aspects of language use, media, and ethnic social relations. Scores for each item on the scale are summed up and averaged to obtain a score for acculturation (possible range = 1 to 5). Validity and test–retest reliability are high for this scale (Marín et al., 1987). Internal reliability (Cronbach's α) for this study was 0.92.

2.2.4. Body satisfaction

The Body Happiness Questionnaire (BHQ; Witt, Braitman, & Park, manuscript in preparation) was also included to assess body satisfaction. Each item on this survey lists a physical characteristic or body part. Participants are asked to rate how content they are with each characteristic. The responses can range from “very unhappy” to “very happy,” (coded −2 to 2, respectively; possible range = −30 to 30). Participants are also asked how important this characteristic is in

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defining their own physical appearance. Responses range from "not at all important" to "very important," (coded 0 to 3, respectively; possible range 0 to 45). This measure demonstrated adequate internal consistency in the original study (Body Weight and Fitness $\alpha = 0.94$; Physical Attractiveness Scale $\alpha = 0.91$), as well as significant positive correlations with other measures of body satisfaction and self-esteem, negative correlations with depressed mood, and no significant correlation with social desirability, suggesting adequate validity (Witt, et al., manuscript in preparation). The original study multiplies happiness ratings and importance ratings of weight and fitness and physical attractiveness to produce two subscales. For the purposes of this study, we retained a separation of happiness ratings and importance ratings. Three BHQ subscales were utilized in the present study, including Body Weight and Fitness Importance ($\alpha = 0.93$), Body Weight and Fitness Happiness ($\alpha = 0.92$), and Perceived Attractiveness Happiness ($\alpha = 0.91$).

2.2.5. Internalization of sociocultural norms

The Sociocultural Attitudes Towards Appearance Questionnaire—Men & Women (SATAQ-MEN & WOMEN) (Heinberg, Thompson, & Stormer, 1995) asks participants about their beliefs and attitudes regarding general body image. A sample item is, "I believe that clothes look better on a thin model." Here, the SATAQ internalization subscale was used and is comprised of eight items. Responses range from "completely agree" to "completely disagree." The subscale evaluates the level of acceptance participants have for society's standards. Scores are summed and averaged with higher scores indicating greater internalization of sociocultural attitudes (possible range = 1 to 5). The psychometric characteristics of this scale have previously been established and are adequate (Heinberg et al., 1995). Internal reliabilities were 0.87 for males 0.82 for females.

2.2.6. Body composition

A body composition analyzer (Tanita Body Composition Analyzer—Model TBF-215) which passes imperceptible electrical impulses through the feet was used to assess participants' height, weight, and BMI. The body composition analyzer has been shown to be reliable in estimating body composition (Nuñez, Gallagher, Russell-Aulet, & Heymsfield, 1997a,b).

2.3. Procedure

This study's procedures were approved by the institutional review board. Informed consent was obtained prior to the completion of the survey packet, and participants were assured that all of their information would remain confidential. After participants completed the survey packet, they were asked to remove their shoes and socks before they stepped on the body composition analyzer, where they were weighed, had their heights measured, and had their body composition taken. The results of their body composition analyses were discussed with each participant on an individual basis. Participants were then debriefed, and researchers answered any questions that arose and afterward assigned course credit to participants. All participants received a pamphlet for the University Counseling Center, so if any part of the study promoted distress or discomfort, they had an avenue to address concerns further.

2.4. Statistical analyses

Chi squared analysis was used to assess gender differences on the unhealthy weight loss methods variable, while independent samples *t*-tests were used to compare genders on continuous participant characteristics, as well as BHQ and SATAQ subscales. Correlations were used to examine acculturation in relationship to relevant variables. While analyses were planned, the large number of individual tests conducted in the matrix were Bonferroni corrected ($p = 0.05$; 25 correlations $= 0.05/25 = 0.002$). Regression analyses were used to predict willingness to put health at risk to lose weight and number of unhealthy weight loss methods employed. Ordinal regression was used to examine the number of unhealthy weight loss methods utilized. The negative log–log link function was employed, as lower levels of unhealthy weight loss methods are assumed to be more probable. A test of parallel lines null hypothesis was retained ($p > 0.12$); unhealthy weight loss methods employed was ordinal rather than polynomial. The predictor variables set for all three regressions were acculturation, the Body Weight and Fitness Happiness Scale, the Body Weight and Fitness Importance Scale, the SATAQ Internalization Scale of sociocultural attitudes toward appearance, BMI, and gender.

3. Results

Participant characteristics by gender are displayed in Table 1. The mean age of participants was 19.91 (SD = 3.47) with an average BMI of 24.02 (SD = 4.23). The average level of acculturation of this sample was 3.11 (SD = 0.76), which is almost identical to previous studies in this population (e.g., Rodríguez-Esquivel, Cooper, Lopez, Taylor, & Venegas, 2007). Independent samples *t*-tests suggest that Hispanic females internalized sociocultural attitudes toward appearance more so than Hispanic males. Hispanic females found personal attractiveness more important than Hispanic males. Interestingly, Hispanic males were *less* happy with their personal attractiveness compared to

Table 1
Participant characteristics ($N = 163$) by gender.

	Males ($n = 68$, 42%)		Females ($n = 95$, 58%)		
	n	%	*n*	%	
Unhealthy weight loss behaviors reported					χ^2 (3) = 6.29, *n.s.*
None	40	59	37	39	
One	11	16	23	24	
Two	8	12	16	17	
Three or more	9	13	19	20	
	M	SD	*M*	SD	
Willingness to put health at risk	1.75	1.03	1.95	1.00	$t(161) = -1.22$, *n.s.*
Age	19.93	2.97	19.91	3.80	$t(161) = 0.04$, *n.s.*
BMI	25.79	4.57	22.76	3.47	$t(161) = 4.80$, $p < 0.001$
Happiness with personal physical attractiveness	17.06	11.64	22.39	11.38	$t(161) = -2.92$, $p < 0.01$
BWFS happiness	5.44	11.20	2.31	10.45	$t(161) = 1.83$, $p = 0.07$
BWFS importance	28.78	9.64	31.12	8.68	$t(161) = -1.62$, *n.s.*
SATAQ internalization	2.76	0.90	3.09	0.80	$t(161) = -2.44$, $p < 0.05$
SASH acculturation level	3.21	0.70	3.03	0.79	$t(160) = 1.51$, *n.s.*

BMI ranges: Males (18.0–37.5); Females (17.6–32.5).

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Table 2
Multiple regression predicting willingness to put health at risk to lose weight.

Variable	*B*	S.E. B	β	*p*	95% CI	
Gender (female)	0.26	0.18	0.13	0.15	−0.09	0.61
BWFS happiness	−0.01	0.01	−0.05	0.52	−0.02	0.01
BWFS importance	0.01	0.01	0.06	0.47	−0.01	0.02
SATAQ internalization	0.25	0.10	0.21	0.01	0.06	0.45
SASH acculturation level	0.07	0.10	0.05	0.52	−0.14	0.27
BMI	0.05	0.02	0.22	0.01	0.01	0.10

$R^2 = 0.123$.

Hispanic females. No other gender differences were found in the BHQ and SATAQ subscales.

Acculturation was unrelated to all variables after error control was employed. Regression models included acculturation to examine whether, when considering other variables, level of acculturation was a significant predictor. Still, acculturation was unrelated to outcome variables.

The linear regression model predicting willingness to put health at risk to lose weight was significant (F (6, 155) = 3.41, $p < 0.01$, $R^2 = 0.123$) (see Table 2). Among the variables entered, internalization of sociocultural attitudes toward appearance ($\beta = 0.21$, $p < 0.05$) and BMI ($\beta = 0.22$, $p < 0.05$) predicted the degree to which individuals were willing to put their health at risk to lose weight. Interestingly, gender did not predict willingness to put health at risk to lose weight ($p > 0.15$).

The ordinal regression predicting the number of unhealthy weight loss methods employed to lose weight was significant (χ^2 (6) = 60.51, $p < 0.001$, *Nagelkerke* $R^2 = 0.34$) (see Table 3). Among the variables entered, BMI (OR = 1.20, $p < 0.001$), how important participants considered body weight and fitness (OR = 1.03, $p < 0.05$), internalization of sociocultural attitudes toward appearance (OR = 1.31, $p < 0.05$), and being female (OR = 2.60, $p < 0.001$) were significant predictors of the number of unhealthy weight loss methods used to lose weight.

4. Discussion

Hispanic females in this study internalized sociocultural attitudes toward appearance more and found personal attractiveness more important than Hispanic males. Contrary to hypotheses, three interesting gender findings emerged. First, Hispanic males were *less* happy with their personal attractiveness compared to Hispanic females. Although in studies that attempt to assess male weight concern via experimental manipulation, body image perception changes occur (Lorenzen et al., 2004), yet weight concern is more typically observed in females (Lowery et al., 2005). Second, despite a number of studies finding that females may be more willing to put their health at risk to lose weight (Grieve, Wann, Henson, & Ford, 2006; Wu, Rose, & Bancroft, 2006), data from the current study indicate that gender was not a predictor of Hispanic college students' willingness to put health at risk to lose weight. These findings may suggest that gender's influence on weight concern issues in Hispanic college students is more nuanced relative to other ethnocultural groups, suggesting further study. For example, sociocultural constructs that attend to gender in the context of Hispanic individuals such as adherence to traditional gender roles, may enable a deeper understanding of these issues in border region college students. Future studies should continue to assess this possibility. Third, that no gender differences emerged in terms of willingness to put health at risk to lose weight, yet females engaged in more unhealthy weight loss methods suggests that although both genders state some level of weight concern and weight control intention, only females follow through by engaging in unhealthy weight loss behaviors. Future studies should continue to assess both cognitive and behavioral weight related constructs among both males and females to inform the development of gender and culturally sensitive weight loss and/or healthy eating programs.

Table 3
Ordinal regression predicting number of unhealthy weight loss methods used to lose weight.

Variable	Estimate	S.E.	OR	*p*	95% CI	
Gender (female)	0.96	0.28	2.61	0.001	1.51	4.50
BWFS happiness	−0.02	0.01	0.98	0.139	0.96	1.01
BWFS importance	0.03	0.01	1.03	0.021	1.01	1.06
SATAQ internalization	0.27	0.14	1.31	0.047	1.00	1.72
SASH acculturation level	−0.02	0.15	0.98	0.904	0.74	1.31
BMI	0.19	0.03	1.21	0.001	1.13	1.29

Nagelkerke $R^2 = 0.34$.

The lack of acculturation findings run contrary to the Acculturative Stress Model, which suggests that the stress involved in acculturation may lead to the adoption of unhealthy aspects of a host culture, such as poor eating habits and unhealthy weight loss behaviors (Berry, 1970, 2006). The present study suggests that, within the context of how we commonly measure acculturation, acculturative stress is not of strong influence on weight concern and weight loss behaviors within Hispanic college students living on the U.S./México border. Still, this may be in part a result of the current sample which, regardless of acculturation level, may cross the border regularly and certainly resides in a location in which those of Hispanic descent are the majority ethnocultural group. As such, acculturation or acculturative stress may be of far less importance on the border relative to other communities with regard to some health related constructs and behaviors. Other studies have suggested that other acculturation related constructs such as generational status (Chamorro & Flores-Ortiz, 2000) or sociocultural constructs such as familism (i.e., the degree to which familial needs take precedence over individual ones) may be important to assess in studies of Hispanic weight concern and control (Austin & Smith, 2008).

Results indicate that an increase in BMI can also lead to an increase in willingness to put health at risk to lose weight and to use unhealthy methods to do so. For Hispanic young adult clients concerned with their weight, the role of the clinician or therapist in assuaging a willingness to put health at risk to lose weight may be of great benefit. This may occur by directing the client toward healthy alternatives for losing weight which may represent a prevention strategy for the development of a number of eating disturbances (Stice, Trost, & Chase, 2003). Future work might investigate whether brief health education interventions addressing healthy means of weight loss and weight control may offset future serious mental and physical health problems for Hispanic clients. Future work should also investigate the role of BMI in willingness to put health at risk to lose weight and to use unhealthy weight loss methods to do so within other ethnocultural groups (e.g., Non-Hispanic White, African American, Native American, and Asian American populations).

Similar to BMI, internalization of sociocultural attitudes toward appearance may motivate Hispanic college students to lose weight, though our results indicate that an increase in BMI can also lead to an increase in willingness to put health at risk to lose weight and to use unhealthy methods to achieve weight loss. Again, the role of the therapist or clinician in attending to Hispanic young adult clients' internalization of potentially unhealthy sociocultural attitudes toward appearance may be a successful strategy for preventing future unhealthy attempts to lose weight. Indeed, one study indicated that cognitive behavioral intervention and psychoeducation decreased internalization of sociocultural attitudes toward appearance (Stormer, 1999). Future investigation of brief cognitive behavioral interventions for Hispanic clients at risk for internalizing potentially unhealthy sociocultural attitudes toward appearance seems warranted.

Limitations of this study included the use of a convenience sample, its cross sectional design, and the use of some limited measurement (e.g.,

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single item willingness to put health at risk variable, global assessment of number of unhealthy weight loss methods, lack of frequency of and timeline for employing unhealthy weight loss methods, lack of inclusion of reasons for wanting to lose weight). Future efforts seeking to grow this area of research may wish to systematically draw a more representative sample, longitudinally assess the challenging transitions into and after college, and develop and validate more thorough instruments of weight concern and control for this population. The strengths of this study include the use of understudied samples of both males and Hispanics, the inclusion of an acculturation measure, and the use of precise weight measurement for BMI calculations.

Future studies exploring relationships between willingness to put health at risk and unhealthy weight loss behaviors and their correlates should focus on exploring why Hispanic males may be less satisfied with personal attractiveness, the potential lack of gender difference with regard to willingness toward health risk, and only females following through with weight control behaviors. Examining Hispanics' assessments of sociocultural standards of appearance to assess how, why, and on what factors Hispanics differ in terms of sociocultural awareness from other ethnocultural groups is also warranted. Future work assessing the impact of acculturation and acculturative stress on body image perception should consider using multiple measures of acculturation, novel samples that may not regularly border cross, and other sociocultural constructs such as adherence to traditional gender roles and familism. Finally, the efficacy of health education interventions that promote healthy weight loss and control methods in order to prevent future serious mental and physical health problems in this population should be developed, implemented, and assessed.

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Contributors

Authors Blow, Cooper, and Redfearn designed the study and wrote the protocol. Authors Blow and Redfearn collected and entered much of the data. Author Taylor assisted with the statistical analysis. Authors Blow and Taylor wrote the first draft of the manuscript, and all authors contributed to and have approved the final manuscript.

Conflict of interest

All authors declare that they have no conflicts of interest.

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References

Austin, J. L., & Smith, J. E. (2008). Thin ideal internalization in Mexican girls: A test of the sociocultural model of eating disorders. *International Journal of Eating Disorders*, *41*, 448—457.

Ayala, G. X., Mickens, L., Galindo, P., & Elder, J. P. (2007). Acculturation and body image perception among Latino youth. *Ethnicity and Health*, *12*, 21—41.

Berry, J. W. (1970). Marginality, stress, and ethnic identification in an acculturated aboriginal community. *Journal of Cross-Cultural Psychology*, *1*, 239—252.

Berry, J. W. (2006). Acculturative stress. In P. T. P. Wong & L.C.J. Wong (Eds.), *Handbook of multicultural perspectives on stress and coping* (pp. 287—298). Dallas, TX: Spring Publications.

Breitkopf, C. R., & Berenson, A. B. (2004). Correlates of weight loss behaviors among low-income African-American, Caucasian, and Latina women. *Obstetrics and Gynecology*, *103*, 231—239.

Camp, D. E., Klesges, R. C., & Relyea, G. (1993). The relationship between body weight concerns and adolescent smoking. *Family Community Health*, *26*, 140—146.

Cash, T. F., Morrow, J. A., Hrabosky, J. L., & Perry, A. A. (2004). How has body image changed? *Journal of Consulting and Clinical Psychology*, *72*, 1081—1089.

Centers for Disease Control. (2004). Prevalence of overweight and obesity among adults: United States, 1999–2002: National Center for Health Statistics.

Chamorro, R., & Flores-Ortiz, Y. (2000). Acculturation and disordered eating patterns among Mexican American women. *International Journal of Eating Disorders*, *28*, 125—129.

Dorsey, R. R., Eberhardt, M. S., & Ogden, C. L. (2009). Racial/ethnic differences in weight perception. *Obesity*, *17*, 790—795.

Eisenberg, M. E., Neumark-Sztainer, D., Story, M., & Perry, C. (2005). The role of social norms and friends' influences on unhealthy weight-control behaviors among adolescent girls. *Social Science and Medicine*, *60*, 1165—1173.

George, V. A., & Johnson, P. (2001). Weight loss behaviors and smoking in college students of diverse ethnicity. *American Journal of Health Behavior*, *25*, 115—124.

Grieve, F. G., Wann, D., Henson, C., & Ford, P. (2006). Healthy and unhealthy weight management practices in collegiate men and women. *Journal of Sport Behavior*, *29*, 229—241.

Heinberg, L. T., Thompson, J. K., & Stormer, S. (1995). Development and validation of the sociocultural attitudes towards appearance (SATAQ). *International Journal of Eating Disorders*, *17*, 81—89.

Hubert, H. B., Snider, J., & Winkleby, M. A. (2005). Health status, health behaviors, and acculturation factors associated with overweight and obesity in Latinos from a community and agricultural labor camp survey. *Preventive Medicine*, *40*, 642—651.

Koutoubi, S., & Huffman, F. G. (2005). Body composition assessment and coronary heart disease risk factors among college students of three ethnic groups. *Journal of the National medical Association*, *97*, 784—791.

Lee, R. E., Harris, K. J., Catley, D., Shostrom, V., Choi, S., Mayo, M. S., et al. (2005). Factors associated with BMI, weight perceptions and trying to lose weight in African-American smokers. *Journal of the National Medical Association*, *97*(1), 53—61.

Lester, R., & Petrie, T. A. (1998). Prevalence of disordered eating behaviors and bulimia nervosa in a sample of Mexican American female college students. *Journal of Multicultural Counseling and Development*, *26*, 157—165.

Lorenzen, L. A., Grieve, F. G., & Thomas, A. (2004). Exposure to muscular male models decreases men's body satisfaction. *Sex Roles*, *51*, 743—748.

Lowery, S. E., Robinson Kurpius, S. E., Befort, C., Hull Blanks, E., Foley Nicpon, M., Sollenberger, S., et al. (2005). Body image, self-esteem, and health-related behaviors among male and female first year college students. *Journal of College Student Development*, *46*, 612—623.

Marcus, M. D., Bromberger, J. T., Wei, H., Brown, C., & Kravitz, H. M. (2007). Prevalence and selected correlates of eating disorder symptoms among a multiethnic community sample of midlife women. *Annals of Behavioral Medicine*, *33*, 269—277.

Marín, G., Sabogal, F., Marín, B. V., Otero-Sabogal, R., & Perez-Stable, E. J. (1987). Development of a short acculturation scale for Hispanics. *Hispanic Journal of Behavioral Sciences*, *9*, 183—205.

Nuñez, C., Gallagher, D., Russell-Aulet, M., & Heymsfield, S. B. (1997). *Bioimpedance analysis: A new approach to measuring resistance*. Cancun, Mexico: Poster presentation presented at the annual meeting of the North American Association for the Study of Obesity.

Nuñez, C., Gallagher, D., Russell-Aulet, M., & Heymsfield, S. B. (1997). *Bioimpedance analysis of body composition: A new measurement approach*. Cancun, Mexico: Poster presentation presented at the annual meeting of the North American Association for the Study of Obesity.

Ogden, C. L., Carroll, M. D., Curtin, L. P., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the United States, 1999–2004. *Journal of the American Medical Association*, *295*, 1549—1555.

Pillitteri, J. L., Shiffman, S., Rohay, J. M., Harkins, A. M., Burton, S. L., & Wadden, T. A. (2008). Use of dietary supplements for weight loss in the United States: Results of a national survey. *Obesity*, *16*, 790—796.

Rodríguez Esquivel, D., Cooper, T. V., Lopez, H. I., Taylor, T. J., & Venegas, J. (2007, March). An assessment of sexual risk, attitudes, behaviors, and communication in a sample of Mexican American college students. *Poster Session presented at the annual meeting of Society of Behavior Medicine, Washington D.C.*

Roth, D., & Armstrong, J. (1993). Feelings of fatness questionnaire: A measure of the cross-situational variability of body experience. *International Journal of Eating Disorders*, *14*, 349—358.

Schwitzer, A. M., Rodriguez, L. E., Thomas, C., & Salimi, L. (2001). The eating disorder NOS diagnostic profile among college women. *Journal of American College Health*, *49*, 157—166.

Shamaley-Kornatz, A., Smith, B., & Tomaka, J. (2007). Weight goals, perceptions, and practices among Hispanic and Anglo college females. *Hispanic journal of Behavioral Science*, *29*, 535—553.

Sira, N. (2005). Body image: Relationship to attachment, body mass index and dietary practices among college students. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, *65*, 3694.

Stice, E., Trost, A., & Chase, A. (2003). Healthy weight control and dissonance-based eating disorder prevention programs: Results from a controlled trial. *International Journal of Eating Disorders*, *33*, 10—21.

Stormer, S. M. (1999). The cross-gender effects of an experimental media-focused psychoeducation program (body image). *Dissertation Abstracts International: Section B: The Sciences and Engineering*, *59*, 6080.

Unikel, C., Aguilar, J., & Gómez-Peresmitré, G. (2005). Predictors of eating behaviors in a sample of Mexican women. *Eating and Weight Disorders*, *10*, 33—39.

U.S. Census Bureau. (2006). Nation's population one-third minority. Retrieved October 4, 2006, from http://www.census.gov/Pressrelease/www/releases/archives/population/006808.html.

Weiss, J. W., Merrill, V., & Gritz, E. R. (2007). Ethnic variation in the association between weight concern and adolescent smoking. *Addictive Behaviors*, *32*, 2311—2316.

Witt, K.E., Braitman, K.A., & Park, J. (In preparation). Development and validation of the Body Happiness Questionnaire.

Wu, T., Rose, S. E., & Bancroft, J. M. (2006). Gender differences in health risk behaviors and physical activity among middle school students. *Journal of School Nursing*, *22*, 25—31.