Dieting and its Relationship to Smoking, Acculturation, and Family Environment in Asian and Hispanic Adolescents

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The objective of this article was to examine dieting and its relationship to smoking behaviors and attitudes, acculturation, and family environment in an ethnically diverse sample of adolescents. Participants were 211 adolescent girls and boys: 57% Asian, 16% Hispanic, 27% White. Regular dieting was determined using the Restraint Scale (Herman, 1978). Dependent variables were measured using the Smoking Beliefs and Attitude Questionnaire (Pederson & Lefcoe, 1985), Family Functioning in Adolescence Questionnaire (Roelofse & Middleton, 1985), and Suinn-Lew Asian Self-Identity Acculturation Scale (Suinn, Rickard-Figueroa, Lew, & Vigil, 1987). Dieting girls, as compared to nondiers, had more favorable attitudes toward smoking, more strongly believed that smoking keeps one from eating, and first experimented with cigarettes at an older age. Chronic dieting was related to reports of poorer family functioning, and Asian dieters were more acculturated than nondiers. For boys, there was no relationship between dieting and smoking, acculturation, or family environment. Smoking prevention programs targeted toward ethnic minority adolescent females need to address the issue of weight concern.

Dieting and smoking are two health-compromising, and often co-occurring, behaviors engaged in by adolescents. Dieting has been shown to be correlated with negative psychological and health behavior outcomes, such as depression, lowered self-esteem, social anxiety, and substance and tobacco use (e.g., Cachelin, Striegel-Moore, & Paget, 1997; French, Story, Downes,

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Resnick, & Blum, 1995). Smoking for weight control among adolescents has been well documented, particularly for White females (Crisp, Sedgwick, Halek, Joughin, & Humphrey, 1999; French et al., 1995; French & Jeffery, 1995; Gritz, Klesges, & Meyers, 1989; Wiseman, Turco, Sunday, & Halmi, 1998). Few studies, however, have examined dieting or its relationship to smoking in adolescents from ethnic minority groups.

Research on weight control has shown that Black girls generally are more satisfied at heavier weights than White girls and are less likely to engage in weight reduction (see Crago, Shislah, & Estes, 1996; Neumark-Sztainer, Story, Falkner, Beuhring, & Resnick, 1999; Rosen & Gross, 1987). Findings for Asian and Hispanic adolescents have been inconclusive, though. Neumark-Sztainer and colleagues (1999) found that Asian girls were as likely as their White counterparts to diet, while Hispanic girls were less likely to diet than White girls. On the other hand, Rosen and Gross (1987) reported that Asian adolescents were less likely than Whites and Hispanics to be reducing weight.

Smoking for weight control in adolescence is a particular health concern. Dieting behaviors are positively related to smoking in White adolescent females. Specifically, weight concerns appear to contribute to the initiation of smoking in girls and young women (see review by French & Jeffery, 1995). Despite the pervasiveness of weight concerns and dieting in young women and the negative health effects of cigarette smoking, these concerns have received little research attention among populations of ethnic minority adolescents.

Two studies have examined smoking for weight control in Black adolescents. Camp and colleagues (1993) found that among adolescent regular smokers, 39% of White girls and 12% of White boys used smoking for weight and appetite control, while in contrast not a single Black male or female reported doing so. Similarly, Gritz and Crane (1991) reported that White high school seniors were more likely than Blacks to use cigarettes for weight loss; White girls were twice as likely as Black girls to smoke for weight control. We are not aware of any studies to date that have examined the relationship between dieting and smoking in Asian or Hispanic adolescent samples.

Acculturation and family environment are two factors believed to be related to both weight control and smoking. With regards to weight reduction behaviors, level of acculturation to Anglo-American culture is believed to be related positively to increased risk for chronic dieting (i.e., restrained eating) and disordered eating. Yet, empirical findings have not consistently supported this hypothesis. Although some researchers have demonstrated a positive relationship between acculturation and abnormal eating attitudes for Hispanic and Asian adolescent females (Davis & Katzman, 1999; Gowen, Hayward, Killen, Robinson, & Taylor, 1999; Pumariega, 1986) and Saudi schoolgirls (Al-Subaie, 2000), other studies have not found a correlation between level of acculturation and body dissatisfaction or restrained eating in different samples of Hispanic and Asian girls (Gowen et al., 1999; Ogden & Elder, 1998). This issue is in need of further research.
Familial factors may influence body image and dieting in adolescent girls through perceptions of family relations (Swarr & Richards, 1996). It has been proposed that family environments perceived as high in conflict and low in cohesion and warmth contribute to body image and dieting problems. Some research supports this hypothesis: Girls' perceptions of more negative family relations significantly predicted problematic dieting behavior concurrently and one year later (Byely, Archibald, Graber, & Brooks-Gunn, 2000). Dieting was inversely associated with family connectedness and positively associated with family stress in a large adolescent sample (French et al., 1995). Similarly, girls who had just begun dieting, as compared to those who had never dieted, identified their fathers as being less supportive (Huon & Walton, 2000). These studies, however, have focused almost exclusively on White populations.

The purpose of this study was to examine dieting and its relationship to smoking behaviors and attitudes, acculturation, and perceived family environment in an ethnically diverse sample of adolescents. Specifically, we wanted to compare dieters (i.e., restrained eaters) to nondieters (unrestrained eaters) on regular smoking behaviors, smoking attitudes, and age of smoking initiation. Additionally, we hypothesized that chronic dieters, as compared to nondieters, would: (1) be more acculturated to Anglo-American culture, and (2) report less positive family environments.

METHODS

Participants

Participants ($N = 211$) were 105 adolescent girls and 106 adolescent boys recruited from junior high and high schools with predominantly minority populations (particularly Asian) in two Los Angeles County school districts. Of the sample, 57% self-identified as Asian, 16% as Hispanic, and 27% as White (non-Hispanic). Mean age for the sample was 16.3 years old ($SD = 1.3$). The majority of participants (86.8%) lived in two-parent households.

Recruitment and Procedure

One of the researchers contacted school administrators who agreed to participate in the survey. In an introductory meeting, the school administrator arranged for the researcher to go to classrooms to recruit students. There, the researcher explained the study briefly while displaying an objective, nonjudgmental attitude toward smoking. All students in the classes were encouraged to participate. The researcher emphasized to the adolescents that participation in this study was an opportunity for them to “have their voices heard.” Although no count was made, the majority of students addressed agreed to be in the study. Students were given informed consent forms for them and their parents to sign.
On the researcher's return visit, students who presented both signed consent forms were administered the questionnaire. They were assured that their responses would be completely anonymous; no names or other identifying information were written on the questionnaires, and consent forms were turned in separately. Participants also were instructed that there were no "right" or "wrong" answers, and that honest responses to the questions were crucial to the study. All the students completed the survey in groups in either their classroom or a nearby room. Questionnaires were collected immediately after they were completed.

Instruments

Demographic Information

Participants reported their age, sex, living arrangement (with both parents, with father, with mother), and race/ethnicity (Native or Alaskan American, Asian/Pacific Islander, Black/African American, White [non-Hispanic], Hispanic/Latino, or Other).

Restraint Scale

The restraint scale (RS; Herman, 1978) is a 10-item instrument that measures two components of dieting behavior: concern for dieting and weight fluctuation. The scale ranges from the extreme of someone who has never given a moment's thought about dieting to someone who is overly concerned with dieting. Scores range from 0 to 35, with higher scores indicating greater restraint. According to previous custom, participants were classified as (chronic) dieters if they scored 16 or higher on the RS (Cachelin et al., 1997; Herman & Polivy, 1980; Mahamed (Cachelin) & Heatherton, 1993). In this study, the mean RS score for the sample was 10.0 (SD = 6.0). Dieters were those who scored one standard deviation or more above the mean.

Smoking Behaviors

Participants were asked the following questions to determine their smoking history and status: "Have you ever smoked (this means even one puff of one cigarette)?" (yes/no format); "How old were you when you tried the first puff of a cigarette?"; "How many cigarettes have you smoked in your life?" (less than 1 whole cigarette, 1–10 cigarettes, 11–20, 20–40, 40–100, more than 100); "At what age do you consider yourself a regular smoker?" (or "not a regular smoker"). Participants were considered to be regular smokers if they reported an age at which they started smoking regularly and/or if they reported having smoked more than 100 cigarettes. The 100-cigarette criterion has been used in previous research to distinguish smokers from nonsmokers (USDHHS, 1994, 1998).
SMOKING BELIEFS AND ATTITUDE QUESTIONNAIRE
(Pederson & Lefcoe, 1985) is a 17-item self-report measure developed to study smoking attitudes in late adolescence. It has been used in several cross-cultural studies, and has been shown to have high content validity and reliability (Chen, 1988; Crowe, Torabi, & Nakornkhet, 1994). A higher score indicates more favorable attitudes toward smoking. Two items assess beliefs about smoking for weight control: “Smoking keeps you from eating,” and “Smoking helps you control your weight.”

FAMILY FUNCTIONING IN ADOLESCENCE QUESTIONNAIRE
(FFAQ; Roelofse & Middleton, 1985) is a 42-item self-report measure developed to assess the psychosocial health of the family as perceived by adolescent children within the family. The measure is based on a model integrating family systems theory, developmental tasks and identity formation of the adolescent. The FFAQ has six dimensions or subscales: structure, affect, communication, behavior control, value transmission, and external system. The instrument is scored so that a higher total indicates more positive family functioning.

SUINN-LEW ASIAN SELF-IDENTITY ACCULTURATION SCALE
(SL-ASIA; Suinn, Rickard-Figureo, Lew, & Vigil, 1987) measures the multidimensionality of acculturation by assessing cognitive, behavioral, and attitudinal areas. The instrument has established validity and high reliability (Suinn et al., 1987), and has been used in numerous studies. A higher score indicates greater acculturation to Anglo-American culture. This instrument was completed only by Asian participants, who comprised the largest ethnic group in the study.

Data Analysis
Regular (chronic) dieters \((n = 43)\) were compared to nondieters \((n = 168)\) on the variables of interest using independent sample t-tests and chi-square tests (for categorical variables). Girls and boys were examined separately, since previous literature (e.g., Camp et al., 1993; French, Perry, Leon, & Fulkerson, 1994) suggests that the relationship between weight control and smoking exists for females but not for males. All statistical analyses were performed at a significance level of \(p = .05\).

RESULTS
Preliminary analyses demonstrated that the three ethnic groups were equally likely to consist of Dieters, \(\chi^2(2) = 1.96, p = .60\), and had similar restraint
scores, $F(2, 207) = .11, p = .90$. Girls were somewhat more likely than boys to be Dieters, $\chi^2(1) = 3.67, p = .05$, and girls overall had significantly higher restraint scores, $F(1, 209) = 3.76, p = .002$. There was a significant interaction between gender and ethnicity, $F(2, 204) = 3.43, p = .03$, with White girls having the highest and White boys the lowest restraint scores. (Mean restraint scores for each group are presented in Table 1.)

**DiETING AND SMOKING BEHAVIORS AND ATTITUDES**

Among girls, planned comparisons indicated that Dieters were more likely than Nondieters to be (regular) smokers, $\chi^2(1) = 3.86, p = .04$, and relatedly, smokers had significantly higher restraint scores than did nonsmokers, $t(103) = 2.41, p = .02$. Dieters (both smokers and nonsmokers) had significantly more favorable attitudes toward smoking than did Nondieters, $t(98) = 2.19, p = .03$, and Dieters more strongly endorsed the belief that smoking keeps one from eating, $t(103) = 2.08, p = .04$. (Post-hoc two-way ANOVAs revealed no significant interactions between Dieting Status and Smoking Status on smoking attitudes ($p = .27$) or on endorsement of the item “smoking keeps you from eating” ($p = .52$), indicating that the main effect found for dieting status on these variables was not attributable solely to dieters who smoke.) As compared to Nondieters, Dieters were significantly older when they first experimented with cigarettes (mean age = 10.4 vs. 13.1 years old), $t(60) = 2.76, p = .008$. For boys, there were no significant relationships between dieting status and any of the smoking-related variables.

**DIETING, FAMILY ENVIRONMENT, AND ACCULTURATION**

For girls, family environment was related to dieting status: Dieters reported significantly lower family functioning than did Nondieters, $t(98) = 2.05, p = .04$. This pattern was not found for boys ($p > .05$).

Among the Asian group, dieting status was related to level of acculturation for girls but not for boys. Dieting girls were significantly more acculturated than Nondieters, $t(52) = 2.16, p = .03$. (See Table 2 for mean comparisons between Dieters and Nondieters on the various variables of interest.)

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**TABLE 1.** Mean Restraint Scores for Asian, Hispanic, and White Adolescent Girls and Boys

<table>
<thead>
<tr>
<th></th>
<th>Girls ($n = 105$)</th>
<th>Boys ($n = 106$)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian ($n = 121$)*</td>
<td>11.1 (5.9)</td>
<td>9.8 (6.2)</td>
</tr>
<tr>
<td>Hispanic ($n = 33$)</td>
<td>11.7 (6.0)</td>
<td>7.6 (3.0)</td>
</tr>
<tr>
<td>White ($n = 56$)</td>
<td>13.5 (7.1)*</td>
<td>7.2 (4.9)*</td>
</tr>
</tbody>
</table>

*Significant difference between boys and girls, $F(1, 209) = 3.76, p = .002$  
*No significant difference between ethnic groups, $F(2, 207) = 0.11, p = .90$  
*Significant interaction effect (gender x ethnicity), $F(2, 204) = 3.43, p = .03$
### TABLE 2. Comparisons Between Dieters and Nondieters on Smoking-related Variables, Family Environment, and Acculturation

<table>
<thead>
<tr>
<th></th>
<th>Girls</th>
<th>Boys</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dieters (n = 27)</td>
<td>Nondieters (n = 78)</td>
</tr>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Smoking attitudes&lt;sup&gt;a&lt;/sup&gt;</td>
<td>48.2 (10.4)</td>
<td>43.7 (8.8)&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Smoking keeps one from eating&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.0 (1.3)</td>
<td>2.4 (1.2)&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Smoking controls weight&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.3 (1.1)</td>
<td>2.1 (1.1)</td>
</tr>
<tr>
<td>Age of 1st cigarette</td>
<td>13.1 (1.3)</td>
<td>10.4 (4.2)&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Family functioning</td>
<td>118.2 (20.4)</td>
<td>126.2 (16.2)&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Acculturation&lt;sup&gt;a&lt;/sup&gt;</td>
<td>63.2 (8.8)</td>
<td>54.3 (13.9)&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>p < .05, significant within-gender difference between Dieters and Nondieters.

<sup>b</sup>A higher score indicates more favorable attitudes or stronger endorsement.

<sup>a</sup>Acculturation scale was completed by Asian adolescents only.

### DISCUSSION

In a sample comprised primarily of Asian and Hispanic adolescents, we found that for girls, regular dieting was associated with regular smoking. Furthermore, dieters—regardless of whether they themselves smoked—had more favorable attitudes toward smoking than did nondietering girls, and more strongly believed that smoking keeps one from eating. These findings raise the concern that for ethnic minority girls, as has been found for White adolescent females (French et al., 1995), chronic dieting may be related to other negative health and risk-taking behaviors.

In this study, dieting females first experimented with cigarettes at an older age (average age = 13 years old) than did nondieters. Puberty for girls is a time when physical maturation can lead to increased weight consciousness and body dissatisfaction. Smoking may be initiated at this time for weight control purposes. Among adolescent females, the belief that cigarette smoking is a means of weight control rises dramatically after age 12 (Charlon, 1984), and girls who are concerned about their weight initiate smoking at higher rates than do nondieters (French et al., 1994). Early adolescence (coinciding with puberty) may be a critical age or "window of vulnerability" for girls who are weight conscious in terms of smoking initiation.

Consistent with findings for White adolescent females, we found that chronic dieting was related to reports of poorer family functioning in this ethnically-diverse sample. Less positive family environments, regardless of ethnic background, seem to contribute to the initiation and maintenance of dieting behaviors. Among the Asian girls, Dieters were more acculturated to Anglo-American culture than Nondieters, providing support for the hypothesis that adoption of Western ideals increases risk for dieting and disordered...
eating. We should note, however, that statistical significance is not the same as clinical significance. Some of the differences were modest (for example, in family functioning), and although statistically significant, may not represent meaningful differences among groups.

For adolescent boys, there was no relationship between dieting and smoking behaviors and attitudes, acculturation, or family environment. As expected, boys were less likely than girls to be chronic dieters (15% vs. 26%, respectively), and overall reported less weight concern or dietary restraint. Of all the groups, White boys reported the least dietary restraint. Dieting may have different meanings or functions for boys than for girls. Some recent research conducted in the United States has shown that although thin figures are preferred for males and females of all ages (Rand & Wright, 2001), the ideal male body has become increasingly muscular (Leit, Pope, & Gray, 2001). Based on our findings, it appears that the factors related to regular dieting are different for boys and girls.

The main limitation of our study was the small sample size of some of the groups (in particular White and Hispanic dieters). While weight concern is common in adolescence and weight control behaviors are engaged in by many, regular dieting is not as common (in our sample, 22% of Asian, 14% of Hispanic, and 21% of White adolescents were chronic dieters). The small sample sizes did not allow for meaningful comparisons to be made between ethnic groups on the various variables of interest. Other limitations were the self-report nature of the questionnaires and the self-selection of the sample. Although responses were completed anonymously, we cannot rule out, for example, the possibility that students underreported their smoking behavior. Additionally, since active consent was used in this study, a biased sample may have led to an underestimate of smoking prevalence (Dent et al., 1990). With active consent, students are required to bring the consent form home, get it signed, and bring it back in order to permit participation. Less compliant children are more likely to smoke (Weiss & Weiss, 2002). Our findings hence should be viewed with caution and as preliminary, until replicated by future studies with large samples of ethnic minority adolescents.

Chronic dieting, disordered eating, and smoking for weight control are of particular health concern in adolescent female populations. In this preliminary study, we found that for Asian and Hispanic girls, as is the case for White females, regular dieting is associated with cigarette smoking and/or favorable attitudes toward smoking. Weight concern may contribute not only to the initiation of smoking but also to its maintenance (Meyers et al., 1997). Therefore, smoking prevention and treatment programs developed for these populations need to address the issues of weight concern and the use of smoking as a weight control strategy. Moreover, much further research is needed examining health-compromising behaviors among adolescents from ethnic minority groups.
REFERENCES


Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

