

Disordered Eating and Smoking for Weight Control in Bulgaria and the U.S.

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Most of the research on eating disorders and pathological eating patterns has been done in Western countries, such as the United States, United Kingdom, and Australia. In the past two decades scientists have extended their scope to various countries around the world (Anderson-Fye, 2009; Becker & Fay, 2006). However, there are still regions that have not been examined in detail and report scarce or outdated information on disordered eating attitudes. It is crucial to explore such places and to obtain up-to-date information in order to have a broader perspective in rates and correlates of eating pathology outside of the Western world. Such information will be helpful in understanding culturally distinctive risks and protective factors.

Countries in transition (e.g., social or economic change) undergo rapid cultural changes which may affect in different ways the social status and role of women in such societies (Nasser, Katzman, & Gordon, 2001). For example, Rathner (2001) suggested that the transition to a Western-style economy and individualism in post-communist countries, and the confrontation with modernization and globalization may have produced a number of ill effects on mental health and, particularly, on eating behaviors. Thus, as a culture becomes more westernized, increases in the adoption of unhealthy eating behaviors and the prevalence of eating disorders could be expected.

One part of the world that has gradually been included in eating disorders research in the last decade is Central and Eastern Europe. This region has gone through substantial socioeconomic and political turmoil since the end of the communist regime. Some of the existing research shows that the prevalence of eating disorders and weight preoccupation in Hungary is

very similar to that of Western countries (Rathner, Tury & Szabo, 2001; Szumska et al., 2005). Similar rates of prevalence were found in Romania (Kovacs, 2007) and some researchers have suggested that there is a reported increase of body dissatisfaction and eating restraint that could be associated with westernizing forces (Oltea & Catina, 2006). However, there are Eastern European countries like Bulgaria where eating attitudes and eating disorders have not received as much attention as they have in other countries in the same geographical area.

Bulgaria, a country in Eastern Europe, joined the European Union (EU) in 2007. As a former communist country and a geographical crossroad of the East and the West throughout the centuries, Bulgaria has been undergoing “Westernization” since 1989. Despite the growing attention that eating disorders receive in the Bulgarian media (News.bg; Novinar.net), official and scientific information on abnormal eating behaviors is very scarce and outdated. One of the few studies that shed some light on this topic validated the Eating Disorder Inventory (EDI) and the Eating Attitudes Test (EAT) by comparing one clinical and three non-clinical adolescent (Boyadjieva & Steinhausen, 1996). The researchers identified 10.4% of their non-clinical sample at risk for a potential eating disorder based on the EAT cut-offs of the EAT. This study pointed out the excellent discriminant validity of the scales for all four samples and suggested that these measures could be used in Bulgaria for future research.

Catina, Boyadjieva and Bergner (1996) reported some preliminary results from a comparative study of women in Germany and Bulgaria that investigated the social context and gender identity and the implications that these might have for eating disorders in both countries. The authors conducted focus groups with German and Bulgarian female participants and found interesting cultural differences in the qualitative data they obtained. More specifically, German women experienced greater identity conflicts and perceived themselves as different from the

social ideal for attractiveness, while Bulgarian women did not mention any physical characteristics when describing the cultural female ideal and seemed to envision themselves congruently with this ideal. However, based on these preliminary qualitative data it is impossible to draw any conclusions for abnormal eating behaviors. The study is more than a decade old and so has missed much of the socioeconomic transition. In addition, Catina et al. (1996) had a small sample that did not include men and did not use validated measures.

Disordered eating and smoking for weight control

There may also be cultural differences in the meaning and use of weight control techniques. Since cigarette smoking occurs in a variety of countries and has been well documented as a weight control technique among American women (e.g., Stice & Shaw, 2003), smoking provides an interesting opportunity for cross-cultural weight control comparisons.

Although the detrimental effects of smoking have been constantly communicated to the general population, the number of adult smokers in the United States is 20.8% of the overall population. The highest percentage of smokers is among people in the 18-24 age group of whom 23.9% smoke (Centers for Disease Control and Prevention, 2007). Researchers in the U.S. have paid close attention to gender and racial/ethnic differences in smoking as well as beliefs about its effects. Various studies reveal that White adolescent females seem to be the group at greatest risk to smoke for weight control purposes (Potter et al., 2004). In general, women have been found to have stronger beliefs that smoking can keep their weight down and to engage in smoking as a weight-control strategy more than men (White, McKee, & O'Malley, 2007).

A consistent finding in the literature is that women in the U.S. who use smoking to maintain their weight tend to exhibit disordered eating patterns (Boles & Johnson, 2001; Crisp, Sedgwick, Halek, Joughin, & Humphrey, 1999; Sánchez-Johnsen, Fitzgibbon, Ahluwalia, &

Spring, 2005; Wiseman, Turco, Sunday, & Halmi, 1998). It has been suggested that the relationship between smoking for weight control and eating pathology develops early and has a persistent nature (Voorhees, Schreiber, Schumann, Biro, & Crawford, 2002). Initiation of smoking usually occurs during adolescence and may be caused by a variety of reasons. Body weight dissatisfaction is one of the most significant predictors of adolescent daily smoking (Voorhees et al., 2002). Stice and Shaw (2003) theorize that body image dissatisfaction and disturbed eating patterns greatly increase the risk for smoking initiation during adolescence and, consequently, smoking for weight control perpetuates eating pathology. Thus, body dissatisfaction is related to two serious health problems: eating pathology and cigarette smoking.

When levels of smoking were examined in relation to disordered eating attitudes, Body Dissatisfaction and Drive for Thinness scores, which are subscales of the Eating Disorder Inventory (EDI), were significantly higher for smokers than for non-smokers (Granner, Black, & Abood, 2002). In addition, the scores for the two EDI scales increased in a linear manner with the level of smoking. Furthermore, there seems to be a relationship between smoking and unhealthy weight control behaviors among patients with eating disorders (Delnevo, Hrywna, Abatemarco, & Lewis, 2003). Clinical research also shows that females who suffer from eating disorders are more likely to smoke than controls; specifically, bulimic patients are more likely to smoke than anorectic patients or controls (Anzengruber et al., 2006; Haug, Heinberg, & Guarda, 2001).

Research on smoking as a weight control strategy in the U.S. is ample but little is known about the utilization of cigarettes for the same purpose in other countries. Moreover, in other parts of the world the prevalence of smoking may be a lot higher than that in the U.S. Bulgaria has been among the leading countries in Eastern Europe in terms of smoking prevalence for the

past two decades (Naboko & Dimitrova, 2007). According to data from the National Statistical Institute of Bulgaria (2001), 40.5% of the population above age 15 smokes. These data also report gender differences among smokers – 51.7% of men and 29.8% of women smoke. The prevalence of smoking in the 15-24 age group is disturbingly high - 41.3%, and only the 25-44 age group has a higher prevalence of 58.5%. This raises the possibility that the motives for smoking may differ across cultures.

The present research had three goals. The first was to investigate levels of body dissatisfaction and eating problems in the U.S. and Bulgaria. Additionally, men have been consistently left out of research in disordered eating and weight control smoking as most studies investigate this behavior only in females. It is not reasonable to assume that gender differences in body dissatisfaction, eating dysfunction, and weight control techniques are the same cross-culturally. Thus, the second goal was to investigate gender differences in body image, eating, and weight control in Bulgaria and the U.S. Finally, the third goal of the present research was to assess whether the high prevalence of smoking in the 18-24 age group is related to weight control and abnormal eating behaviors in both the U.S. and Bulgaria. More specifically, it was hypothesized that:

1. The level of disordered eating in Bulgaria would be similar to that of the U.S.
2. Women in both countries would show greater body image and eating disturbances than men. However, given the findings of Catina et al. (1996) suggesting less appearance orientation in Bulgarian women, it was hypothesized that Bulgarian women would have a lower level of disordered eating than American women.
3. Both Americans and Bulgarians will believe that smoking controls weight and will use smoking as a means of weight control. This will be particularly true for women.

4. The belief that smoking controls weight will be associated with disordered eating attitudes in both the American and Bulgarian population, particularly among women.

Method

Participants and procedure

Bulgarian sample

Data were collected in 2008 from students at the University of Plovdiv in Plovdiv, the second largest Bulgarian city. The sample consisted of 101 students, 89 of whom self-declared their ethnicity as Bulgarian (88.1%), 10 students (9.9%) self-reported their ethnicity as Turkish, Roma, Armenian or Greek, and 2 (2.0%) students did not answer. There were 39 men (38.6%) and 62 women (61.4%). The mean age of the respondents was 20.24 ($SD = 1.49$). Participants were recruited in classrooms with the permission of professors after lectures. The students were informed about the study by the principal investigator and were given the survey upon verbal consent to participate. The questionnaire was administered in Bulgarian; it was translated from English to Bulgarian and back-translated by two bilingual translators who agreed on its accuracy.

American sample

Participants were 203 students from a small liberal arts college in the Midwest. Respondents self-reported their ethnicity as 84.7% Caucasian ($n = 172$), 3.5% African-American ($n = 7$), 2.5% Hispanic ($n = 5$), 2.5% Asian ($n = 5$), 0.5% Native American ($n = 1$), 3.5% Multiracial ($n = 7$), and 3.0% ($n = 6$) did not answer. Seventy-six participants were men (37.4%) and 127 were women (62.6%). The average age of the participants was 19.43 ($SD = 1.20$). The consent form and the questionnaire were posted online and students were recruited through class emails. They were asked to read and sign the consent form before proceeding to the questionnaire. Participation was confidential, the survey was anonymous and the consent form

was separate from the questionnaire. Students enrolled in psychology classes received research credit for their participation. The research study was reviewed and approved by the Institutional Review Board at Kenyon College.

Measures

Demographics. Five items provided information about the participants' gender, age, year in college, ethnicity (self-described), and major(s).

Smoking status. Participants were asked if they currently smoked cigarettes ("on a regular basis for the last 30 days"). Those who answered "yes" reported the average number of cigarettes smoked per day.

Beliefs about smoking and smoking motives. This six-item inventory was adapted from the Questionnaire of Smoking Motives by Hajek, West, Foulds, Burrows, & Meadow (1999; as cited in George & Waller, 2005). We used the motivations for smoking as beliefs about smoking and substituted one question ("feeling uncomfortable if not smoking" was substituted with "suppresses appetite"). All participants answered the six items on beliefs about smoking. Later, smokers answered how relevant the same questions are to their own smoking motives. Thus, the general questions were "Do you believe that smoking...?" e.g. helps coping with stress; helps to socialize; gives something to do when bored; helps to concentrate and stay alert; keeps weight down; suppresses appetite. Each statement was rated on a Likert scale from 1 (not at all) to 5 (very much). Later, only smokers were asked about their motives: "If you currently smoke, please answer how *relevant* these reasons are to you: How much do you agree that smoking...?". The same six templates from the previous question were used. Answers were scored on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The belief that smoking controls weight was estimated as the mean of scores of "smoking to keep weight down" and "suppress appetite".

The Cronbach's α for these two items in both samples equaled $\alpha = .76$. The actual use of smoking as a weight control strategy was assessed as the mean of scores of the same two items only among smokers and its reliability was also adequate, $\alpha = .80$.

Eating Disturbance. The Drive for Thinness (DT), Bulimia (B), and Body Dissatisfaction (BD) subscales of the EDI-3 (Garner, 2004) are the three primary scales that make up the Eating Disorder Risk scales and assess symptomatic patterns of eating behaviors and disordered eating. Drive for Thinness has 7 items and assesses an extreme desire to be thinner, obsession with dieting, and concern about weight, dieting, and gaining weight. The Bulimia subscale consists of 8 items and assesses the presence of thoughts associated with binge eating and purging when emotionally distressed. Body Dissatisfaction consists of 10 items and examines attitudes toward body shape and discontent with overall size and size of parts of the body, such as hips, stomach, buttocks, and thighs. All items are scored on a Likert scale from 1 (never) to 6 (always). This measure's reliability ranges between .90 and .97 in normative samples (Garner, 2004). All Cronbach's alphas exceeded .86 (except for the Bulimia subscale, $\alpha = .59$) for the Bulgarian sample and .87 for the American sample.

Results

Descriptive Statistics

Table 1 shows the means and standard deviations for all variables. Independent *t*-test showed that the Bulgarian sample was older than the American sample $t(303) = 5.09, p < .001, d = -.62$. The ratio of men and women in the two samples was very similar, $\chi^2(1, 303) = .04, p > .05, \phi = -.01$. The percentage of Bulgarian students (45.5%, $n = 46$) who smoked was significantly greater than that of American students (14.9%, $n = 30$), $\chi^2(1, 303) = 33.76, p < .001, \phi = -.33$. The amount of cigarettes that the Bulgarian smokers consumed on average per day was

substantially higher than the number of cigarettes American students consumed, $t(73) = 4.36, p < .001, d = 1.03$. Table 1 also presents independent t -tests and Cohen's d scores that compare the beliefs about smoking and the motives for smoking in the two samples. Since only 14.9% of the American sample reported they smoked as opposed to 45.5% of the Bulgarian sample it was deemed that the use of the "motive" variable will restrict our American sample. Therefore, only the "belief about smoking" variable was used in further analyses.

Hypothesis 1 & 2

In order to estimate the levels of BD, DT, and B and the effect of gender and country on each of the EDI-3 subscales, 2x2 factorial ANOVAs were computed. For Drive for Thinness, there was a main effect for gender with women scoring higher than men, $F(1,292) = 55.50, p < .001$, partial $\eta^2 = .16$, and an interaction effect between gender and country, $F(1,292) = 7.65, p < .01$, partial $\eta^2 = .03$ (see Table 2 for means and standard deviations). The interaction effect was further explored by Tukey's post-hoc tests and it was found that American women ($M = 22.89$) scored significantly higher than American men ($M = 13.37$) and Bulgarian men ($M = 16.03$), $p < .001$, and Bulgarian women ($M = 20.39$) had significantly higher scores than American men and Bulgarian men, respectively, $p < .001$ and $p = .02$. There were no significant differences between the American and Bulgarian women, $p = .14$.

Similar results were found for the Body Dissatisfaction subscale with a main effect of gender where women had higher scores than men, $F(1,282) = 51.35, p < .001$, partial $\eta^2 = .15$, and an interaction effect, $F(1,282) = 11.97, p = .001$, partial $\eta^2 = .04$. Tukey's post-hoc tests indicated that American women scored significantly higher than all three groups, $p < .02$ for all, while Bulgarian women were significantly more body dissatisfied than U.S. men only, $p < .001$.

As shown in Figure 1, the Bulimia subscale revealed a main effect for country with Americans reporting more bulimic symptoms than Bulgarians, $F(1,284) = 4.58, p = .03$, partial $\eta^2 = .02$, a main effect for gender with women having higher scores than men, $F(1,284) = 9.78, p = .002$, partial $\eta^2 = .03$, and an interaction effect, $F(1,284) = 7.81, p = .006$, partial $\eta^2 = .03$. Further investigation with Tukey's post-hoc tests showed that American women reported more bulimic symptoms than all three groups, $p < .001$ for all.

Hypothesis 3

A 2x2 factorial ANOVA (Gender x Country) revealed no main effects on the belief that smoking keeps weight down, yet there was a significant interaction effect (see Figure 2), $F(1, 294) = 3.89, p = .05$, partial $\eta^2 = .01$, with Bulgarian men ($M = 5.16$) endorsing this belief more than Bulgarian women ($M = 4.89$), and the reversed pattern for American men ($M = 4.68$) and American women ($M = 5.35$). However, Tukey's post-hoc tests did not reveal any differences between the four groups and the only group difference that could not reach statistical significance was between American men and American women, $p = .073$. The same factorial ANOVA with smoking for weight control as a motive did not reveal any significant main or interaction effects.

Hypothesis 4

Pearson correlations were run to investigate the relationship between the belief that smoking controls weight and the EDI-3 subscales in each sample. Table 3 shows the correlations for the U.S. and the Bulgarian sample. Belief that smoking controls weight was correlated significantly with the scores of each EDI-3 subscale scores in the U.S. sample. Pearson correlations ranged between $r = .24$ and $r = .29, p < .001$. However, in the Bulgarian sample the

correlations between the same variables were not significant, $r = .03, p = .78$ (BD), $r = -.07, p = .54$ (B), and $r = .19, p = .06$ (DT).

Discussion

One of the main purposes of this study was to examine disordered eating in Bulgaria. The constructs of Drive for Thinness, Body Dissatisfaction, and Bulimia were explored in relation to country and gender. The findings suggest that the level of eating disturbances in Bulgaria is similar to that in the U.S. Since Bulgaria is a country that has been going through various economic and social changes in the past 20 years the similar level of disorder eating could be explained with Nasser, Katzman, and Gordon's theory (2001). These authors suggested that eating disturbances in countries in transition reach levels equal to those of western countries as they become more westernized.

However, this study also found differences in disordered eating between the Bulgarian and American samples. American women scored significantly higher than American men on all EDI-3 measures. Surprisingly, Bulgarian women differed from Bulgarian men *only* on Drive for Thinness scores. What is worth noting is the *lack* of gender differences in the Bulgarian sample on the body dissatisfaction and bulimia scales. One possibility is that gender roles and expectations may be different in Bulgaria. As mentioned earlier, Catina et al. (1996) reported that Bulgarian women seemed to have different definitions of the "ideal" woman, particularly in terms of appearance, than did German women. Another possibility is that due to the low reliability of the Bulimia subscale, this particular construct was not measured well and could not detect differences.

At the same time, it is important to address the intermediate position of the Bulgarian men who were more body dissatisfied, wanted to be thinner, and were exhibiting higher bulimic

symptomatology than American men although these differences were not significant. Yet, these patterns could imply that cultural pressures regarding appearance and leanness may be stronger for Bulgarian men. Therefore, further investigation of this phenomenon is needed in order to find out if there are higher pressures on men's appearance and lower pressures on women's appearance in Bulgaria compared to the U.S.

The only difference that was found between the two countries was that Americans endorsed significantly more bulimic behaviors than Bulgarians did. This finding could be explained with the fact that bulimia has been associated more often with Western cultures (e.g., Keel & Klump, 2003). Although Bulgaria has become more westernized in the past decade and bulimia has received attention in the media, the Bulgarian students in this study hardly endorsed bulimic symptoms in comparison with the American students. Again, the low reliability of the Bulimia subscale could have contributed to this finding.

This study also examined if the high prevalence of smoking in Bulgaria could be associated with the belief that smoking controls weight. The results were intriguing because they suggested that both Americans and Bulgarians believed in the anorectic effects of nicotine. In addition, smoking for keeping one's weight low and for appetite suppression were equally endorsed by both American and Bulgarian smokers. These findings showed that smoking was considered as a weight control method by smokers and non-smokers in both samples. In addition, there was an interaction between country and gender that revealed Bulgarian men were more likely to believe that smoking had weight-controlling functions in comparison to Bulgarian women. However, the subsequent Tukey's post-hoc tests showed only one marginally significant difference between the four groups ($p = .07$). Therefore, this finding needs further exploration and replication before it can be interpreted.

The last hypothesis of this study was that smoking for weight control will be related to eating disturbances in both countries, particularly among women (Potter et al., 2004). Nevertheless, we failed to find a relationship between the belief that smoking controls weight and disordered eating (Drive for Thinness, Body Dissatisfaction, and Bulimia) in the Bulgarian sample. Yet, consistent with previous research, this relationship was statistically significant in the American sample (Granner et al., 2001; Stice & Shaw, 2003). However, the absence of statistically significant correlations between the belief that smoking controls weight and eating disturbances in the Bulgarian sample questions the universality of this relationship despite the equal endorsement of smoking as a weight-control strategy in both countries. Alternatively, a recent study suggested that both appearance evaluation predicted smoker status among both men and women in the UK, but not overweight preoccupation and self-reported weight (Grogan, Hartley, Fry, Conner, & Gough, 2010).

Some of the limitations of this study include the small number of smokers in each sample which made it difficult to draw conclusions about smokers. In addition, a more sensitive scale of smoking for weight control may be needed, when this construct is measured in the future. Prospective studies may also consider including other variables that look at different methods of weight control, such as dieting, exercising, purging, or use of laxatives (Delnevo et al., 2003). Further, measuring the construct of Westernization in future studies will be of utmost importance in order to establish if there is a relationship between western influences and disordered eating. To our knowledge, an acculturation measure for use with Eastern Europeans is not available and our attempt to develop one based on existing measures was unsuccessful. Moreover, the inclusion of measures of individualism and collectivism and gender roles for both samples may shed more light at certain cultural specificities associated with the Bulgarian sample. Lastly, it is

important to point out that the study examined nonrandom convenience samples, which restricts the generalizability of the findings.

This study adds to the existing research by investigating a country, Bulgaria, where little research has been done on the examined topics and comparing it to the existing findings on disordered eating and smoking for weight control. Such research not only expands our knowledge of unexplored areas but also helps us to better understand the ones that we have already investigated. This study shows that American women may need special attention and help when smoking for weight control and disturbed eating patterns are discussed. Prevention and treatment programs for eating disorders among American women should consider the smoking status of women and should target female smokers for more specific programs. At the same time, interventions for quitting smoking have to pay special attention to women who may engage in this behavior to control their weight. Future research needs to find solutions for the addressed limitations and to answer more specific questions about the gender differences within the Bulgarian sample. It would be interesting to find if the Bulgarian culture has less pressure for women and more for men in comparison to the American culture. Gender stereotypes, media images, family relations, and peer groups are all realms that need to be probed for additional and more detailed answers.

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Table 1

Means and Standard Deviations for Smoking Beliefs and Smoking Motives

Variable	Bulgarian		American		<i>T</i>	Cohen's <i>d</i>
	Mean	SD	Mean	SD		
Age	20.24	1.49	19.43	1.20	5.09**	.62
Amount of cigarettes	13.20	7.03	6.64	5.02	4.36**	1.03
<u>Beliefs</u>						
Cope	2.39	1.28	2.67	1.11	-1.95	-.24
Socialize	1.71	1.00	2.80	1.24	-7.68**	-.94
Suppress Appetite	2.85	1.34	2.70	0.99	1.05	.13
Relieve Boredom	3.00	1.44	2.72	1.16	1.79	.22
Keep Weight Down	2.16	1.13	2.40	0.94	-1.96	-.24
Concentrate	1.51	0.86	1.96	1.00	-3.84**	-.47
<u>Motives</u>						
Cope	2.78	1.21	4.03	0.62	-5.13**	-1.25
Socialize	2.13	1.22	3.86	0.95	-6.37**	-1.55
Suppress Appetite	3.13	1.20	3.17	1.00	-.16	-.04
Relieve Boredom	3.38	1.37	4.11	0.69	-2.57*	-.64
Keep Weight Down	2.83	1.28	2.69	0.93	.48	.12
Concentrate	1.85	1.17	3.21	1.26	-4.60**	-1.21

** $p < .001$; * $p < .05$

Table 2

*Means and Standard Deviations for Factorial 2x2 ANOVAs with EDI Subscales as
Dependent Variables*

		<u>Bulgarian</u>		<u>American</u>	
Variable		Mean	(SD)	Mean	(SD)
Drive for Thinness	Male	16.03	(5.32)	13.37	(5.92)
	Female	20.39	(7.30)	22.89	(8.56)
	Total	18.65	(6.89)	19.38	(8.95)
Body Dissatisfaction	Male	25.70	(5.07)	21.72	(7.23)
	Female	30.07	(7.06)	34.25	(11.17)
	Total	28.50	(6.73)	29.66	(11.59)
Bulimia	Male	13.89	(4.05)	13.36	(3.69)
	Female	14.16	(4.69)	18.13	(8.29)
	Total	14.05	(4.42)	16.32	(7.28)

Table 3

Correlations in Bulgarian sample (below the diagonal) and American Sample (above the diagonal)

Variables	1	2	3	4	5
1. Smoking Weight Belief	–	.25**	.24**	.25**	.29**
2. Drive for Thinness	.19	–	.84**	.71**	.94**
3. Body Dissatisfaction	.03	.63**	–	.67**	.94**
4. Bulimia	-.07	.37**	.30**	–	.84**
5. EDI Total	.08	.90**	.84**	.59**	–

** $p < .001$

Figure 1

Main Effects and Interaction Effect on Bulimic Symptoms

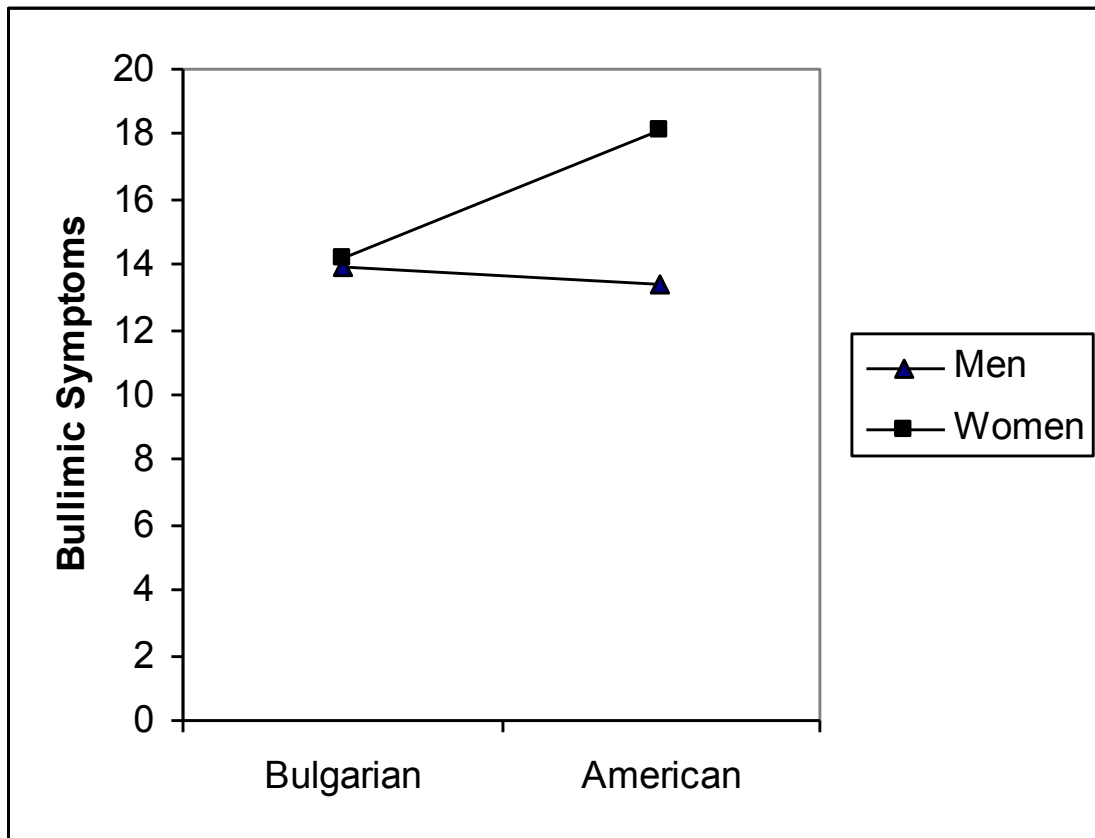


Figure 2

Interaction Between Gender and Culture on the Belief that Smoking Controls Weight

