

ORIGINAL RESEARCH

Cultural change and explicit anti-fat attitudes in a developing nation: A case study in rural Dominica

Sarah Krebs Council, Ph.D.; Caitlyn Placek, M.A.

Abstract

Research has demonstrated the negative effects of social stigma on overweight and obese individuals. Beyond a burgeoning obesity epidemic, there appears to be a globalization of negative attitudes towards obesity. This study examined anti-fat attitudes among women from the Commonwealth of Dominica using a standardized psychometric scale - the Attitudes Towards Obese Persons Scale (ATOP). We examined the impact of education level, body mass index, measures of development, and media usage on perceptions of obesity. Results demonstrated that rural Dominican women have high levels of anti-fat attitudes that are trending with developing and industrialized nations. The presence of a Facebook account was significantly associated with ATOP scores. There were significant interaction effects among Facebook account and age, as well as Facebook account and garden work. These findings suggest that online social networking increases anti-fat attitudes among women who are young and non-traditional.

Sarah Krebs Council Ph.D. M.A. Cultural Anthropology;
Washington State University
Email: sarahkcouncil@gmail.com

Caitlyn Placek, Ph.D. (ABD) Evolutionary
Anthropology; M.A. Evolutionary Anthropology
Washington State University
Email: caitlyn_placek@wsu.edu

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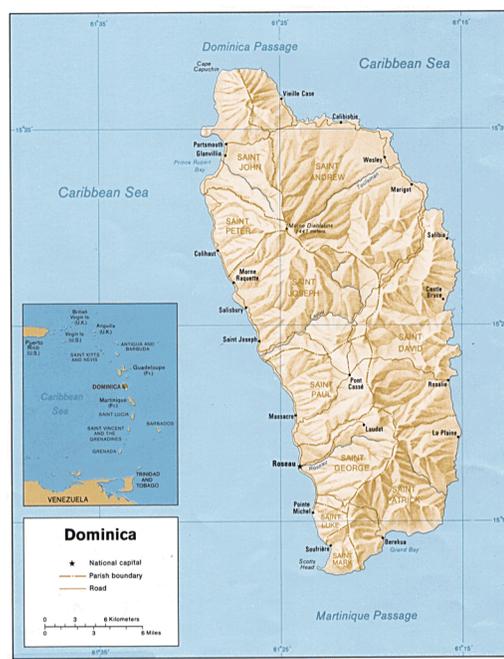
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Map of Dominica



Source: <http://www.lib.utexas.edu/maps/americas/dominica.gif>

Introduction

Variation in body norms is context-dependent across cultures. In industrialized Western nations, body fat is considered “bad,” “ugly,” and “un-attractive.” In the U.S., this reckoning of “fat as bad” results in pervasive disparagement and stigmatization of the considerable number of overweight and obese individuals.¹⁻³ This perception has not always been pervasive; anthropological research shows traditional societies highly regard fatness as a symbol of prosperity and health.⁴⁻⁷ As the processes of globalization take hold, attitudes towards fatness are also shifting. Specifically, with increased media exposure and public health campaigns, fat stigma is increasing and there is a

“profound global diffusion of negative ideas about obesity.”⁸ Most notably, the highest levels of fat stigma – namely, social stigma and prejudice – are found in middle-income developing nations.⁸

Following Goffman,⁹ Carr quotes that a key component of stigmatization is the “*pervasive devaluation of individuals possessing a ‘discredited’ personal attribute.*”¹⁰ In the U.S., stigmatization results in discriminatory practices in the workplace,¹¹ education,^{12,13} housing,¹⁴ and health-care.^{2,15-17} Advancing the scope of weight-based discriminatory practices,¹⁸ social scientists note weight bias in interpersonal relationships, the media, and psychological and physical health.

The global spread of anti-fat attitudes may be attributed to a variety of factors¹⁹ and shifting body norms play an integral role. These factors include: media use, ethnographically driven markers of cultural development, current weight, and level of education. The role of media in body image studies was once considered a taboo topic for anthropologists,²⁰ yet media anthropology now recognizes “mass media as vehicles of culture.”²¹ In a meta-analysis, Grabe et al.²² review findings of how the media (specifically, magazines and television) influence body image concerns. In the U.S., media and pop culture have propagated the ideal of thinness.²³ Described as an “enculturative force,”²⁴ Western-based television images provide an influential means of modifying body norms, particularly slim ideals,²⁵ and body dissatisfaction and disordered eating.²⁶

As cultural “borders” become more permeable, rural communities in developing nations no longer exist in relative isolation. Becker’s study of adolescent Fijian women²⁷ documents the adoption of slim ideals in the decade following the introduction of television in a rural community. As for the effects of media on West Indian women, attitudinal measures of body size among Barbadian women show an inverse relationship between time spent watching television and ideal body size.^{28*} As the media landscape changes, researchers are increasingly investigating the effects of the Internet on body norms and attitudes as there are clear “social implications of becoming connected to a

* The authors note that these findings do not demonstrate causation. Barbadian women may have smaller body size preference due to the influence of beauty images seen on television or it may be that those who prefer smaller sizes have more access to televisions.

global community.”²⁹ Bair and colleagues³⁰ demonstrated a link between Internet and television use and an increase in body dissatisfaction in young women, while Tiggemann and Miller³¹ link internet exposure with body dissatisfaction and a drive for thinness among adolescent girls. Finally, the role of online social networking (OSN) must be considered. Research from the University of Haifa³² addressed the role of Facebook use and the development of eating disorders among women. The amount of time spent on Facebook was correlated with an increased likelihood of developing a negative body image and a variety of eating disorders. The Internet’s speed and scope is likely altering the transmission of ideas and attitudes.

Overweight and obese individuals typically have lower rates of weight satisfaction, yet the relationship between weight status and anti-fat attitudes remain unclear.³³ Studies examining the role of an individual’s body size on her or his attitudes towards obesity have shown mixed results; several studies have found no link between an individual’s weight and his or her stigmatizing attitudes.^{18,34} Conversely, other studies have reported that obese individuals are more likely to hold negative attitudes towards obesity,^{35,36} with some research showing a modest association between body weight and fat-stigmatizing attitudes.³⁷

The role of education is another potential contributor to anti-fat attitudes, although here too studies have shown mixed results. Hilbert et al.³⁸ and Sikorski et al.³⁹ found that educational level was associated with obesity stigmatization and that lower educational level predicted higher levels of anti-fat attitudes. Conversely, Hansson and Rasmussen’s review³³ concluded that education was not associated with anti-fat stigma as measured by the Attitudes Towards Obese Persons (ATOP) scale. In populations experiencing increased access to education, this latter trend may not hold. Education is likely to introduce Western-based biomedical ideas of health and wellness via mass media.⁸ In the wake of rising global obesity rates, these messages describe the risks of adiposity and exacerbate the idea of “fat as unhealthy.”

Given the status of overweight and obesity as a major threat to global health, it is imperative that attention be turned to the developing world.^{40,41} In the Caribbean, as elsewhere, increasing obesity poses significant threats: loss of productive time,

decreased quality of life, and increased healthcare costs.⁴² As noted previously, a correlation between fatness and higher socioeconomic status (SES) in traditional societies has long been established.^{4-7,43} Yet, paradoxically, obesity now impacts those in lower SES in developing nations as well.⁴³ Ethnographic studies throughout the Caribbean note the association of larger body size among females with fertility, sociability, and positive body image.^{7,44,45} Adolescents associate overweight and obese bodies with health and wealth.⁴⁶ Given these qualitative and quantitative findings, relatively low levels of anti-fat attitudes should be predicted.

The people of rural Dominica serve as an apt study population to investigate the correlates of anti-fat attitudes and gauge levels against cross-cultural trends. Using the standardized psychometric scale ATOP,⁴⁷ this cross-sectional study examined the levels of anti-fat attitudes among residents in a rural Dominican village experiencing significant globalization pressure.^{48,49} Body Mass Index (BMI) and assorted demographics facilitated a better understanding of intra-cultural variation in anti-fat attitudes among subjects. Lastly, cross-cultural comparison allowed an assessment of how well villagers' attitudes paralleled global trends.

Study site

The Commonwealth of Dominica is a small island nation that sits between Martinique and Guadeloupe in the Lesser Antilles. More than most islands, environment has guided its course. Dominica is the most mountainous, most rural, and least developed nation in the Caribbean, with a population of 71,293.⁵⁰ Dominicans are of mixed ancestry including African, European, and Island Caribs.⁵¹ Most Dominicans are bilingual, speaking English Creole and French Patois.

The village of Bwa Mawego is located on the windward (Atlantic) side of the island. It is rugged even by Dominican standards.⁵¹ There are about 500 full- and part-time residents.⁵² Traditionally, Bwa Mawegans are horticulturalists. The majority of the land in the village is cultivated.⁵¹ Most Bwa Mawegans maintain both a *bush* (rainforest) and home garden. Bush gardens are cared for primarily by males and contain food staples such as taro and yams. Home gardens consist of herbs used for cooking and medicinals. Medicinal plants and herbs are most often used in day-to-day health maintenance. Commercial opportunities are rare and

include fishing, running a rum shop, teaching school, driving a *transport* (shuttle to the capital, Roseau), and intermittent construction work. Young women are now finding clerical work in Roseau. Secondary school opportunities began in 1980. During the ensuing thirty-five years, government assistance provided opportunities for the best rural students to attend secondary schools in Roseau.⁵³ In conjunction with this improved educational access, living in and/or commuting to town afforded these select students an urban experience. Since 1998, there is a secondary school located a few villages away and education is now compulsory until graduation or age 16. Additionally, some young men and women attend *college* (the 12th and 13th year of school, the equivalent of a high school diploma in the U.S.). This level of education is expensive and only a select few can afford it. Young women comprise the majority of college students. As with the earlier experience of secondary school in Roseau, most students live in the capital while some commute back and forth. Again, this increases young women's urban experience.

As might be predicted, the village is undergoing rapid development.^{48,53} However, the consequences of development act in unpredictable and diverse ways.⁵⁴ Education, commercial employment, and consumerism are increasing. Cable television came to the village in 2004, providing an avenue through which to view other, outside societies.⁵⁵ A few homes now have Internet, cell phones are ubiquitous, and travel to/from town is frequent, as is inter-island migration.⁴⁸

The Dominican Ministry of Health is now turning its attention to non-communicable diseases and their associated risk factors, specifically elevated blood pressure and type 2 diabetes mellitus. Public health campaigns aimed at raising awareness of the harmful effects of excess body weight, elevated blood pressure, and high levels of blood sugar are on the rise. For example, radio announcements and fliers promote hiking activities and encourage Dominicans to "Get healthy." Accordingly, rural Dominicans may be experiencing new health messages and adjusting body norms, specifically attitudes towards fatness.

Hypotheses:

This study tested the following hypotheses for ATOP scores:

- 1) *Education*: Higher levels of education are predicted to be positively associated with higher levels of fat stigmatization (i.e., lower ATOP scores). Rationale: Health education may result in an increased level of stigmatization due to the deleterious health effects associated with obesity.⁸
- 2) *BMI*: Individual weight status is predicted to be negatively associated with ATOP scores. Rationale: In the U.S., subjects that are overweight/obese and trying to lose weight have the most negative attitudes about body fat.⁵⁶
- 3) *Acculturation to a modern lifestyle*: The following markers of acculturation to a modern lifestyle are predicted to negatively influence ATOP scores: commercial employment, use of luxury goods, not having a home garden, and frequency of trips to Roseau. Rationale: Individuals with commercial jobs regularly interact with people who are not from Bwa Mawego and they leave the village more often. Modern consumer items (i.e., refrigerators, washing machines) signify a more modern lifestyle. In turn, this lifestyle is connected to the outside world.⁵³ Traditionally, a horticultural village,⁵¹ Bwa Mawegans may be abandoning this lifestyle in favor of convenience foods as is shown in other populations
- 4) *Media exposure*: Exposure to media is predicted to decrease ATOP scores. Rationale: Ethnographic studies in this population demonstrate that local changes reflect global models (i.e., increased anti-fat stigma) via the introduction of television.⁵⁵

Methods

This study used a cross-sectional design to test the four hypotheses. Data were collected from 2012 through 2013 as part of a larger study on the state of overweight/obese women in Bwa Mawego.

Using a convenience sample, 74 adult females ages 18-75 were selected from the larger study group. The first author (SC) held successive interviews with the subjects over multiple trips. Canvassing the village, informal and formal interviews were conducted in women's homes and yards. All interviews were presented verbally, in English, Dominica's official language. Washington State University IRB provided institutional ethical oversight for this research under #12554.

Outcome measure

ATOP interview: Explicit anti-fat attitudes were measured using a standard psychometric scale – the Attitudes Towards Obese Persons Scale. This scale consists of twenty questions with a six-point Likert scale, ranging from “I strongly agree” to “I strongly disagree.” The questions include negative and positive associations with overweight/obesity and contain statements such as “Obese people are usually sociable” and “Obese people are just as healthy as non-obese people.” Of note, a higher ATOP score is suggestive of less anti-fat attitudes. This scale is reliable and valid, and has been tested in numerous populations, including other middle-income developing nations such as Paraguay.⁵⁷

Predictor variables

Education was self-reported, and scored as follows: 0 = none; 1 = primary school; 2 = secondary; 3 = college/business training school; 4 = university.[†]

BMI was assessed using a digital scale (Omron full body composition sensing monitor and scale) and a portable tape measure. The Omron scale calculates BMI (among other measures) when height is entered into the scale and the participant weighs her or himself. The standard measurement for overweight and obesity is the body mass index (BMI). (For a discussion on the critiques and limitations of BMI, see Reynaldo Martorell.⁵⁸) BMI is defined as body weight (in kilograms) divided by the square of body height (in meters). Standard BMI cut-offs are as follows: normal weight (BMI=18.5-24.9), overweight (BMI=25-29.9), and obese (BMI≥30).

Acculturation to a modern lifestyle was measured by four indicators: 1) commercial employment; 2) garden work; 3) owning ‘luxury’ items such as a washing machine; and 4) frequency of trips to town. Commercial employment was dichotomized with a presence or absence response. Likewise, garden work was dichotomized with a “yes” or “no” in response to the question “Do you garden?” Luxury items were an index score of total items owned. Trip frequency to town were scaled to: 1 = never; 2 = less than two times/year; 3 = less than

[†] In Dominica, secondary school ends after 11 years of education, with graduation around age 16. “College” refers to the optional and competitive 12th and 13th years of education, with typical graduation at age 18.

Table 1
Variable descriptions and Summary Statistics (N=74)

Variable	Description	Present/Yes	Absent/No
Garden	Presence/absence of having a garden (0=no, 1=yes)	35	39
Commercial Employment	Presence/absence of commercial employment (0.no, 1=yes)	52	22
Washing machine	Presence/absence of owning washing machine (0=no, 1=yes)	29	45
Fbook Account	Presence/absence of having a Facebook account (0=no, 1 =yes)	33	41
Computer	Presence/absence of having a computer (0=no, 1=yes)	43	31
Television	Presence/absence of having a television (0=no, 1=yes)	16	58

Variable	Description	Mean	Median	S.D.	Min	Max
ATOP Score	Lower core indicates higher stigmatization	56.3	57	15.1	16	93
Age	Age in years	38.1	39.5	15.4	18	75
Age Q3	Quantile split of age (1=low, 2=medium, 3=high)	1.9	2	0.83	1	3
BMI	Body mass index (kg m ²)	27.2	26.7	5.6	16.3	44
LogBID	Natural log of body mass index	3.8	3.8	0.0	3.80	3.82
Education	Years of education	1.6		0.9	0	4
Trip frequency	Trip frequency to town (1 = never, 7 = lives in town part-time)	3.93	4	1.26	1	7
Age Q3 X FBook	Interaction between Age Q and Fbook	-0.3	-0.5	0.3	-0.5	0.6
Garden X Fbook	Interaction between Garden and Fbook	-0.1	-0.2	0.2	-0.3	0.3

twelve times/year; 4 = monthly; 5 = weekly; 6 = daily; and 7 = lives in town part time.

Media exposure was measured with three predictor variables: 1) having a Facebook account, 2) owning a computer, and 3) owning a television. Each variable was dichotomized into a absence/presence (0=no, 1=yes).

Confounding variables

Age was included as a potential confounder for markers of cultural development. In Bwa Mawego, older women typically maintain traditional lifestyles, e.g., cooking on a fire as opposed to a stove, whereas younger women are more likely to use mass media and work in a commercial occupation.

Statistical analyses

Multiple linear regression analysis in STATA/IC v. 10 for Macintosh was used to test for associations among variables. BMI was log-transformed in an effort to normalize the variable. A new measure for age was created using three quantiles for young, middle, and old age (AgeQ3). This measure was created to ease interpretation of interaction effects (for example, see Placek and Quinlan⁵⁹). Across all models, ATOP scores were regressed on the untransformed “age” variable and AgeQ3 to ensure consistency of results. The results below only present the findings for AgeQ3. First-order variables were also centered on their means to test for interaction effects. Quadratic terms were tested with continuous variables, and interaction terms were

entered for each predictor and significant effects were retained in the models. Alpha level was set to $\alpha=.10$ for quadratic effects and $\alpha=.05$ for interactions.

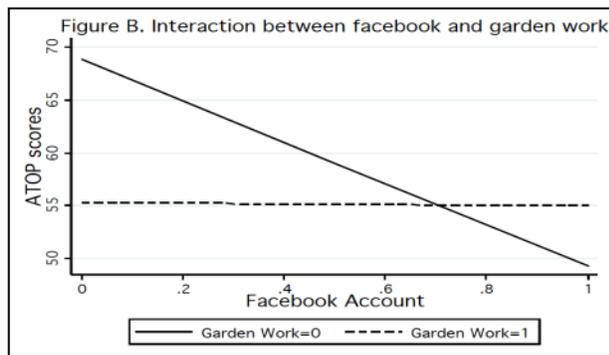
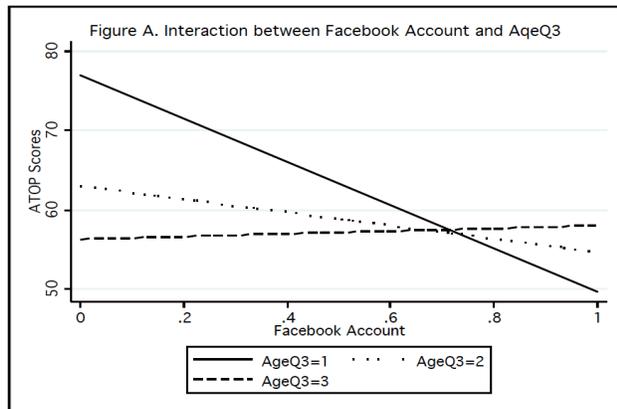
Results

Description of study population

Table 1 displays the descriptive statistics. On average, participants were 38 years old (mean=38.1±15.4). The average BMI was 27.2 (range: 16.3-44). ATOP scores ranged from 16 to 93, with a mean of 56.3, with a Cronbach’s alpha of 0.89, which indicates excellent internal reliability.

Table 2
Linear regression models of ATOP scores

	Coeff.	Std. Error	T-value	P> z		95% Confidence Interval	Model Statistics
MODEL 1 <i>ATOP Scores</i>							
Fbook	-9.21	3.62	-2.54	0.013	*	-16.43— -1.99	N= 74
Computer	-1.34	3.66	-0.37	0.715		-8.65— 5.97	R ² = 0.10
Television	1.75	4.14	0.42	0.674		-6.51— 10.00	Adj. R ² = 0.07
_cons	59.62	3.91	15.22	0.000		51.81— 67.44	
MODEL 2 <i>ATOP Scores</i>							
Fbook	-11.1	4.5	-2.5	0.02	*	-20.1— -2.1	N= 74
AgeQ3	-2.7	2.7	-1.0	0.31		-8.1—2.1	R ² =0.16
Fbook X AgeQ3	13.2	5.4	2.4	0.02	*	2.4—24.0	Adj. R ² =0.12
_cons	70.25	6.89	10.21	0.00		56.53— 83.98	
MODEL 3 <i>ATOP Scores</i>							
Fbook	-10.5	3.3	-3.1	0.002	*	-17.1— -3.8	N= 74
Garden	-4.9	3.3	-1.5	0.15		-11.5—1.8	R ² =0.22
Fbook X Garden	19.2	6.7	2.9	0.01	*	5.8—32.6	Adj. R ² =0.19
_cons	64.75	2.94	22.00	0.00		58.88— 70.62	



Across all hypothesized variables, having a Facebook account was the only significant variable ($b = -15.0$, $p = 0.01$), such that having a Facebook account predicted higher anti-fat attitudes (Table 2). Next, we tested for interaction effects across all variables against having a Facebook account, since variation in the main effect of having a Facebook account might depend on the effect of another predictor. For example, age might moderate the relationship between having a Facebook and perceptions of obesity. There was a significant interaction effect between having a Facebook account and AgeQ3 ($b = 13.2$, $p = 0.02$). For the younger age category, having a Facebook account predicted higher anti-fat attitudes. A significant interaction effect was also found for presence/absence of garden work and having a Facebook account: when garden work was zero (an indication of more acculturation), having a Facebook account predicted higher anti-fat attitudes ($b = 19.2$, $p = 0.01$). Figure 1 displays the interaction effects. Analyses did not yield significant quadratic effects for any continuous variable. Overall, results indicated that the model including the interaction between having a Facebook account and garden work explained the most variance in ATOP scores

($R^2 = 0.22$). Beta weights were calculated for each model to determine the largest effect. Across models, having a Facebook account remained a significant variable with the largest beta weight ($\beta = 0.39 - .58$).

Regression diagnostics were conducted for all models, including variance inflation factor (VIF) to test for multicollinearity, Cook's distance, and residual plots. Variance inflation factors for all models were below 3.0, Cook's distances scores were less than 10 times the mean, and residual plots did not stray from normality. Overall, these findings indicate that the models presented here demonstrate adequate linearity.

Discussion

This study tested the association between ATOP scores and various predictor variables: education, BMI, acculturation to a modern lifestyle, and media. Based on the ATOP scale, rural Dominicans display rather high explicit anti-fat stigma in comparison to other study populations. This finding is somewhat surprising given the fact that socio-cultural trends in the Caribbean favor larger bodies, particularly for women.^{7,45,60} Previous research by Brewis and Wutich⁵⁷ included samples of Paraguayan women and U.S.-based undergraduate students. The Paraguay sample ($N = 200$) had a mean ATOP score of 58.05 ($SD = 14.5$). For the U.S. undergraduate population ($N = 66$), the mean ATOP score was 64.59 ($SD = 16.7$). Paraguayan women exhibit higher levels anti-fat attitudes compared to U.S. undergraduates and slightly higher scores compared to rural Dominican women (mean = 56). Therefore, findings among Dominican women are similar to other middle-income and developing nations. Nonetheless, Dominican women have the highest levels of anti-fat attitudes among both middle-income and developing nations' study populations.

We found that among the variables tested, having a Facebook account was the strongest predictor of anti-fat stigmatization. The use of Facebook showed an interaction with garden work and age, such that Facebook-using women who were younger and who did not garden were the groups with highest levels of anti-fat stigmatization.

Previous research has shown the power of the media, particularly internet-based communication, to transform a society. Social change may occur with unparalleled breadth and rapidity via the Internet.⁶¹ In particular, social media is a "great

information equalizer”⁶² and online social networks play a particular role due to their interactive nature. Indeed, the ubiquity of Facebook is undeniable,⁶³ with over 500 million daily users, yet its utility beyond social interaction is questionable. In fact, its use may lead to harmful psychological consequences.⁶⁴ Current research among young Americans reveals that time spent on Facebook is correlated with body dissatisfaction due to peer comparison⁶⁵ and the risk of developing eating disorders among adolescents.⁶⁶ In this case, it may be one primary avenue by which stigmatization of overweight and obesity is spreading. Among rural populations such as Bwa Mawego, this potential avenue of transmission appears to be a priority area for future investigation.

Furthermore, it is no surprise that Facebook interacted with age; having a Facebook account increased young women’s anti-fat attitudes. For the “younger” and “middle” age categories, having a higher education was associated with lower ATOP scores as well (i.e., increased anti-fat attitudes). We expect younger women to have a greater connection to the “outside” world via online social networks, as indicated by prior research.^{29,31,66} Having a Facebook account reflects this connection, and in turn, provides greater access to cross-cultural social constructs, such as fat stigma.

In terms of the interaction effect between gardening and having a Facebook account, garden work is a marker of a traditional lifestyle. Conversely, having a Facebook account signals connectivity to more modern habits. As women “modernize,” they may find traditional practices to be less interesting. Indeed, one of the themes that emerged during informal interviewing was that women who were away from home more (i.e., attending school or working in town) did not partake in domestic tasks. Gardening is one such task associated with domesticity. In Bwa Mawego gardening may be viewed as somewhat of a social relic. In tandem, OSNs, particularly Facebook, usher in new connections with the outside world. Both (lack of gardening *and* an online presence) represent new trends in Bwa Mawego; high levels of anti-fat attitudes appear to reflect these trends.

This study adds to the literature examining the powerful ways that the media, namely OSNs, may transform cultural aesthetics. Rural West Indian populations are known to prefer a ‘plump’ build for women,⁷ yet body norms appear to be shifting. This

reflects Becker’s study of the introduction of television among young Fijian women.²⁷ There, traditional cultural aesthetics also favored a robust build for females. Mass media shifted these traditional preferences in a short amount of time.⁶⁷

Cross-cultural comparison

Regarding cross-cultural trends, rural Dominicans interject body fat into conversation in an open and frank manner: “You fat, wi.” (You’re fat, right). Everyday conversation includes candid remarks about an individual’s body, including the amount of fat. Given this social truth, it is not surprising that attitudes towards fatness are openly discussed among residents. This open expression of fat stigma may be connected to social norms that tolerate open and frank speech. Brewis et al⁸ note that Mexican, Paraguayan, and American Samoan samples lack self-censorship in terms of expression of fat-stigmatizing statements. This may not reflect beliefs *per se*, but rather social norms regarding open expression. Ethnographically speaking, the same holds true for this study population. Communication in this small-scale group is candidly frank. Thus, Bwa Mawegan women appear to be expressing body norms that are disseminated via Facebook.

Limitations

Findings from this study were limited by relying primarily upon categorical data (e.g., our measure for having a Facebook account). Also, Bwa Mawegans may reckon the biomedical category of obese and overweight as normalized or even preferred. To evoke “obesity” or “obese people” in a questionnaire may bring to mind extreme versions of corpulence. This very issue was referenced in Baglar’s recent work,⁶⁸ noting the discrepancy between biomedical categories of overweight/obese and patients’ recognition of risky adiposity. Indeed, participants emphatically claimed to not have many obese people in the village and that obesity is “not a problem.” There is, in fact, no class III obesity present (BMI ≥ 45), i.e., no one is super-obese. This perspective may create an “us” and “them” dichotomy in villagers’ attitudes and, hence, may bias responses. This speaks to the potential discrepancy in cultural models of body fat.⁶⁹ In addition, men were not included in this study. This data may not be generalizable to the male population as men may or may not have similar

ATOP scores to women. The model explained 22% of the variance in ATOP scores, which is promising in social science, and yet 78% of anti-fat attitudes are explained by other factors. While this study did not include other factors, it does set the stage for future research.

Conclusion

On par with global trends, the rural Dominicans in our study stigmatized body fat, as measured by low ATOP scores. With the advance of globalization, OSNs seem to have become conduits for the dissemination of body norms generally, and body fat specifically, within this population. Undeniably, it is important to understand Facebook's influence on how ideas about body image are shifting.⁶⁶ The ubiquity of Facebook has far reaching effects even in the rural areas of the Caribbean's most mountainous, most rural, and least developed nation.

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