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Abstract

In recent years, websites that stress the message of thinness as the ideal and only choice have surfaced on the internet. The possibility that pro-anorexia websites may reinforce restrictive eating and exercise behaviors is an area of concern. In addition, friends may be influencing one another to view these websites, further contributing to drive for thinness in women and drive for muscularity in men. Three hundred male and female undergraduate psychology students responded to questionnaires assessing: internalization of pro-anorexia website content, internalization of general media content, influence of friends to view pro-anorexia websites, peer influence, drive for muscularity, and drive for thinness. Results showed internalization of pro-anorexia website content was positively correlated with drive for thinness in women, and negatively correlated with drive for muscularity in men. Internalization of pro-anorexia website content was found to be related to both drive for thinness in women and drive for muscularity in men.

Keywords: drive for thinness, pro-anorexia websites, friend influence, media internalization, drive for muscularity

Introduction

Although recent reviews of disordered eating research show that anorexia and bulimia are holding a steady pace of occurrence (Currin et al., 2005; Fambonne, 1995b; Hoek, 2006; Keel et al., 2006), the consistent number of cases of bulimia and anorexia imply the need to understand further the possible factors that can lead to development of these eating disturbances. According to Weltzin et al. (2005), about 10% of individuals with anorexia and bulimia are men, indicating that disordered eating behaviors can occur regardless of gender. Although anorexia and bulimia are more commonly recognized in our society, most individuals would fall under the category of Eating Disorder Not Otherwise Specified (EDNOS). The EDNOS category is for behaviors or disorders that do not necessarily meet the criteria for a diagnosis of anorexia or bulimia (APA, 2000); it includes anorexic-like and bulimic-like behaviors such as drive for thinness, excessive dieting, excessive exercising, purging and bingeing. Research shows that about 50% of adults that seek treatment for an eating disorder are diagnosed with EDNOS and 60% of most eating disorder cases are EDNOS (Fairburn et al., 2007; Fairburn & Bohn, 2005). Drive for muscularity is a newly coined term, which is not yet classified under any specific disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V). However, Murray et al. (2010) argue that the drive for muscularity component in muscle dysmorphia is parallel to drive for thinness in anorexia because of the similarities of the symptoms and the high attention to diet, as well as the compensatory behavior of excessive exercise.

Regardless of classification, the onset of disordered eating behaviors and/or exercise behaviors can be attributed to a variety of factors; the influence of mass media is one possible contributor to drive for thinness in females (Rodgers, Paxton, & Chabrol, 2010), and in males (Leit, Gray, & Pope, 2002). Alperin (2004) suggests high levels of disordered eating behaviors are due to media influence. Carney and Louw (2006) suggest that media consumption is frequently related to an increase in the occurrence of disordered eating behaviors and attitudes. According to Grabe, Ward, and Hyde (2008), media has an important role in defining female and male ideals. This is alarming as adolescents have increased their media consumption in recent years (Homan, 2010).

However, the effects of media exposure are disputable, as some research suggests the effects are small to moderate and misinterpreted, and may depend on the media source (e.g., TV, print, internet) (Ferguson, Winegard, & Winegard, 2011; Grabe et al., 2008; Holstrom, 2004). The discrepancy in the influence of media exposure only highlights the fact that not everyone is negatively affected by media exposure. Rather, real problem seems to come when those who are susceptible to media images view those images and then internalize them (Engeln-Maddox, 2005; Giles & Close, 2008). For example, internalization of sociocultural standards of appearance significantly

predict women's body dissatisfaction (Cheng & Mallinckrodt, 2009; Lokken, Worthy, & Trautmann, 2004), drive for thinness, and bulimic symptoms (Lokken et al.). Similarly, men who internalize media images of muscular men are more likely to experience eating disturbances (Giles & Close, 2008). In addition, Leit et al. (2002) have suggested that one of the strongest predictors of drive for muscularity is the internalization of the media body ideals.

Amongst various kinds of mass media, the internet has managed to embed itself as an increasing source of influence. In the past decade, pro-anorexia websites have surfaced. These websites contain images and writings that support the pursuit of an ideal thin body image (Williams & Reid, 2007). Research has shown that pro-anorexia websites stress thinness as the ideal choice for women (Bardone-Cone & Cass, 2006), and in some websites ideal images of muscularity and thinness for men. Furthermore, pro-anorexia websites have been touted as support networks for those suffering from eating disorders, as many offer space for members to interact with one another (Brotsky & Giles, 2007). Scholars have expressed concern that pro-anorexia websites may be detrimental to a female's eating behaviors and body image (Bardone-Cone & Cass, 2007). Researchers found that women who had viewed these websites at least once had a decrease in self-esteem (Bardone-Cone & Cass, 2007). Reports also show an increased likelihood of future engagement in many negative behaviors related to food, exercise, and weight (Bardone-Cone & Cass, 2006).

Furthermore, to the extent that pro-anorexia websites offer space for their members to interact, they may provide not only media influence but also some level of peer influence. Research suggests that adolescents rely greatly on their friends when it comes to the development of body image and weight-related behaviors (Wang, Houshyar, & Prinstein, 2006). Shomaker and Furman (2009; 2010) found that interpersonal pressure from parents, romantic partners and friends are important sources of influence on attitudes or behaviors towards muscle gaining and on anorexic-like and bulimic-like behaviors such as drive for thinness, excessive dieting, excessive exercising, purging and bingeing. According to Grieve (2007), the views of muscularity as the ideal body type for men are reinforced by family, significant others and friends. Social influence is a strong predictor of dietary behaviors (Huon, Lim, & Gunewardene, 2000). Research has shown that members of particular social groups may exhibit the same behaviors as their peers in order to avoid being rejected (Shea & Pritchard, 2007). If and when uniformity exists in social groups it can be implied that friends will tend to consume the same type of media. According to Tiggemann and Miller (2010), about 82.5% of adolescent females report knowing about websites focusing on appearance through their friends. Media influence in combination with the influence friends exert over disordered eating and exercise behaviors, may suggest that friends affect the consumption of media in the form of viewing pro-anorexia websites in pursuit of thinness and drive for muscularity. In addition, this peer influence may be enforced on the sites themselves as adolescents meet new 'cyber buddies' that may offer some level of support for their eating disorder (Brotsky & Giles, 2007).

Disordered eating and exercise behaviors have been thought to be a female trend, and in past research, males have been ignored. However, studies show that males are at risk of developing disordered eating behaviors as well (Weltzin et al., 2005). Internalization of media ideals creates an increased level of drive for thinness and is an important predictor of drive for muscularity in men (Leit et al., 2002). This internalization seems even more apparent as mass media expands to the realm of the World Wide Web. The birth of pro-anorexia websites seems to be keeping a stable rate of cases of exercise behaviors and disordered eating. Pro-anorexia websites are full of pictures of thin female models, muscular and thin male models, as well as letters or quotes encouraging the continuation of anorexia, which has been found to have harmful effects (Bardone-Cone & Cass, 2007). Furthermore, some sites compound their influence by offering some level of peer support through on-line interactions between members (Brotsky & Giles, 2007). Research suggests that friend influence over the viewership and use of pro-anorexia websites may add to the already harmful effects of viewing pro-anorexia websites alone, and that the support adolescents receive on the sites themselves may add to their influence (Brotsky & Giles, 2007). Due to the impact friends have on both men's and women's dieting, drive for thinness, excessive exercise and the desire to gain muscle mass (Agliata & Tantleff-Dunn, 2004; Shomaker & Furman, 2009), it may be possible that friends influence the purposes of media use. Thus, friends could influence each other to view pro-anorexia websites to continue or institute drive for thinness and drive for muscularity.

The primary purpose of the present study is to explore the relationships between internalization of general media content and pro-anorexia website content, peer influence (general as well as specific influence to view pro-anorexia websites), drive for thinness in females, and drive for muscularity in males in the college student population. Literature suggests that pro-anorexia websites and friend influence over the viewership of the websites may affect

men's drive for muscularity and women's drive for thinness (Bardone-Cone & Cass, 2006). Therefore, we have decided to focus on drive for thinness in females and drive for muscularity in males. We will also compare the correlations between internalization of pro-anorexia website content and drive for thinness and drive for muscularity against the relationships between general website content and drive for thinness and drive for muscularity. Second, the present study will examine the influence of friends on the use of pro-anorexia websites as a means to aid in the pursuit of thinness in females and the drive for muscularity in males. Finally, it will examine whether the internalization of pro-anorexia website content and friend influence over viewership of pro-anorexia websites predict drive for thinness and drive for muscularity. Overall, this study hopes to expand on the research of pro-anorexia websites and their effects on drive for thinness and muscularity among the collegiate population.

We propose four hypotheses. Hypothesis 1: Drive for thinness will correlate with internalization of pro-anorexia website content as well as with internalization of general media content in women. Hypothesis 2: Drive for muscularity will correlate with internalization of pro-anorexia website content as well as with internalization of general media content in men. Hypothesis 3: The influence of friends over the viewership of pro-anorexia websites will correlate with the internalization of pro-anorexia website content in both men and women, as will general friend influence. Hypothesis 4: Because pro-anorexia websites offer a combination of both media and peer influence, the relationships between internalization of pro-anorexia website content and drive for thinness in women and drive for muscularity in men will be stronger than the relationships between general friend influence or general internalization of media content and drive for thinness in women and drive for muscularity in men.

Method

Participants

Three hundred introductory psychology students 18 years or older participated in this study. Participants ranged in age, gender and race. About 55.9% were female students and 39.5% were male students. The average age was 22.37 ($SD=6.25$), with the oldest student being 55 years old and the youngest 18 years old. About 76.8 % of students were Caucasian, 6.5% Latino, 5.5% Asian, 1.9% African-American, 1.0% Pacific Islander, 1.3% Native Americans and 2.9% considered themselves as 'Other.' The Institutional Review Board approved the study protocol before data collection began.

Materials and Procedure

Drive for thinness. Disordered eating symptoms were measured by the Drive for Thinness Subscale (DT) from the Eating Disorder Inventory (Garner & Olmsted, 1984). The subscale is known to reliably distinguish individuals with symptoms of anorexia and those without symptoms of anorexia (Garner, Olmsted, & Garfinkel, 1983). Participants respond to statements regarding extreme dieting, preoccupation with weight, and the fear of gaining weight (i.e., I thinking about dieting and I am preoccupied with the desire to be thinner) using a 6-point Likert Scale (1= *always*, 2=*usually*, 3=*often*, 4= *sometimes*, 5=*rarely* and 6= *never*). Items were summed to create a scale score ($\alpha =.92$).

Drive for muscularity. Drive for muscularity was measured by the Drive for Muscularity Scale (DFM) (McCreary & Sasse, 2000). The DFM questions were adapted to include questions about how they felt about body tone (i.e., I think I would feel more confident if I had more muscle mass/body tone). Responses were based on a 6-point Likert scale (1 = *always*, 2 = *very often*, 3 = *often*, 4 = *sometimes*, 5 = *rarely*, and 6 = *never*). The DFM is scored by obtaining the average rating of the items, with higher scores indicating a greater drive for muscularity ($\alpha =.91$).

Internalization of pro-anorexia website content. Internalization of content presented on pro-anorexia websites was adapted by the author from the Multidimensional Media Influence Scale (MMIS) (Cusumano & Thompson, 2001). The MMIS questions were adapted to ask about pro-anorexia website viewership (i.e., I like to browse websites that support anorexia) and the motivations behind viewership of the websites (i.e., I like to browse websites that support anorexia in order to get motivated to lose weight). Responses were based on a 5-point Likert Scale (1=*strongly agree*, 2= *agree*, 3=*neither agree nor disagree*, 4= *disagree* and 5=*strongly disagree*). Items were summed to create a scale score ($\alpha =.79$).

Internalization of general media content. Internalization of general media content was adapted by the author from the Multidimensional Media Influence Scale (MMIS) (Cusumano & Thompson, 2001). The MMIS questions were

adapted to ask about general website viewership (i.e., I like to browse websites that contain pictures of thin celebrities) and the motivations behind media viewership (i.e., I would like my body to look like the pictures of models). Responses were based on a 5-point Likert Scale (1=*strongly agree*, 2= *agree*, 3=*neither agree nor disagree*, 4= *disagree* and 5=*strongly disagree*). Items were averaged to create a scale ($\alpha = .85$).

Friend influence to view pro-anorexia websites. Friend influence questionnaire was adapted from the Perceived Friend Preoccupation with Weight and Dieting Scale by Shroff (2005). The 9-item scale was adapted to ask questions more relevant to the encouragement of disordered eating behaviors and the viewership of pro-anorexia websites (i.e., How often do your friends: Encourage you to view websites that support anorexia). Responses were based on a 5-point Likert Scale (1= *never*, 2= *rarely*, 3=*sometimes*, 4= *quite often* and 5= *very often*). Higher scores indicated a higher friend influence over viewership and drive for thinness ($\alpha = .88$).

General friend influence. General friend influence questionnaire was assessed by the Perceived Friend Preoccupation with Weight and Dieting Scale by Shroff (2005). The 9-item scale was adapted to ask questions more relevant to the encouragement of disordered eating behaviors (i.e., How often do your friends: Encourage you to lose weight, Comment on each other's weight, and Talk about weight and dieting). Responses were based on a 5-point Likert Scale (1= *never*, 2= *rarely*, 3=*sometimes*, 4= *quite often* and 5= *very often*). Items scores were averaged to create a scale ($\alpha = .84$).

Undergraduate students were given the surveys individually through Qualtrics; an online survey software. Time limits to complete the survey were not set, thus an average time of completion was not recorded. Upon participation completion, each student was awarded credit towards their General psychology class grade.

Results

Media Internalization, Friend Influence, and Drive for Muscularity in Men

As predicted, drive for muscularity was positively correlated with the internalization of pro-anorexia website content (see Table 1). Drive for muscularity and general media internalization were also positively correlated (see Table 1). Drive for muscularity did not correlate with friend influence to view pro-anorexia websites, or with general friend influence (see Table 1).

Media Internalization, Friend Influence, and Drive for Thinness in Women

Our hypothesis that the drive for thinness would correlate with more internalization of pro-anorexia website content was supported (see Table 2). Drive for thinness was positively correlated with general media internalization (see Table 2). Finally, drive for thinness was positively correlated with friend influence to view pro-anorexia websites as well as with general friend influence (see Table 2).

Relative Contributions of Media Internalization and Friend Influence to the Variance of Drive for Muscularity in Men

To determine the relative contributions of media internalization (general and pro-anorexia website specific) and friend influence (general as well as influence to view pro-anorexia websites) to drive for muscularity in men, we regressed all four variables on drive for muscularity in men using the stepwise regression method (see Table 3). We chose the stepwise method because we felt it was important to discover not only which variables predicted drive for muscularity, but also their relative importance.

Interestingly, the only predictor of drive for muscularity in men was media internalization of pro-anorexia websites, which accounted for 10% of the variance in DFM, $R^2 = .10$, $F(1, 116) = 12.31$, $p = .001$ (see Table 3).

Contributions of Media Internalization and Friend Influence to the Variance of Drive for Thinness in Women

To determine the relative contributions of media internalization (general and pro-anorexia website specific) and friend influence (general as well as influence to view pro-anorexia websites) to drive for thinness in women, we regressed all four variables on drive for thinness in women using the stepwise regression method (see Table 4).

Similar to men, media internalization of pro-anorexia websites was the primary predictor of drive for thinness in women, accounting for 30% of the variance, $R^2 = .30$, $F(1,161) = 70.79$, $p < .001$, with general friend influence serving as the secondary predictor, contributing an additional 9% of the variance, $R^2 = .39$, $R^2 \Delta = .09$, $F(2,160) = 50.87$, $p < .001$, and general media internalization as the tertiary predictor, contributing an additional 2% of the variance, $R^2 = .41$, $R^2 \Delta = .02$, $F(3, 159) = 37.48$, $p < .001$ (see Table 4).

Discussion

The primary purpose of the present study was to explore the relationships between internalization of general media content and pro-anorexia website content, peer influence (general as well as specific influence to view pro-anorexia websites), drive for thinness in females, and drive for muscularity in males in the college student population. Results will be discussed below separately for each gender.

Men

As expected, the results from the present study show a positive relationship between drive for muscularity and the internalization of pro-anorexia website content, as well as with the internalization of general media content in men. This is not surprising given the research suggesting that one of the strongest predictors of drive for muscularity is the internalization of the media body ideals (Giles & Close, 2008; Leit et al., 2002). Contrary to our hypothesis, we found that friend influence to view pro-anorexia websites did not correlate with the increase of drive for muscularity in men, nor did general friend influence. This is interesting given that Agliata and Tantleff-Dunn (2004) and Shomaker and Furman (2009) suggested friends have influence over the dieting, drive for thinness, excessive exercise and the desire to gain muscle mass in both men and women. Future research will need to explore this issue in more depth.

Finally, as hypothesized, the relationship between internalization of pro-anorexia website content and drive for muscularity was stronger than the relationships between general friend influence or general media internalization and drive for muscularity in men. In fact, the present study showed that the only predictor of drive for muscularity in men was media internalization of pro-anorexia websites. This is not surprising given previous research (Giles & Close, 2008; Leit et al., 2002) that has consistently shown media internalization, and in this case internalization of pro-anorexia website content, is a strong predictor of drive for muscularity in men. However, given that only 10% of the variance in drive for muscularity was accounted for by internalization of pro-anorexia website content, clearly there are other factors contributing to drive for muscularity in men. Future research should explore this further. In addition, it is unclear whether the peer support aspects of pro-anorexia websites or the internalization of the images that appear on pro-anorexia websites is more important as a predictor of drive for muscularity. Given the lack of a relationship between peer influence and drive for muscularity in the present study, one might expect that the media internalization aspect of pro-anorexia websites is more important, but future research should explore this issue in depth.

Women

As hypothesized, both the internalization of pro-anorexia website content and the internalization of general media content were correlated with drive for thinness in women. This is not surprising given Lokken et al.'s (2004) finding that media internalization relates to increased drive for thinness. When it came to friend influence, as hypothesized, we found a significant relationship between the influence to view pro-anorexia websites and drive for thinness, as well as between general friend influence and drive for thinness. Although debate continues on the influence of media on disordered eating and exercise behaviors, friend influence seems to still make its mark as a contributing factor. Corroborating research by Tiggemann and Miller (2010) found that a high percentage of girls reported friend influence on website viewing choices. The results from the present study are also in accordance with research suggesting that social influence is a factor in predicting dieting behaviors (Huon et al., 2000) and that close relationships (i.e., friends and family) influence the development of drive for thinness, excessive exercise and the desire to gain muscle mass (Shomaker & Furman, 2009).

Finally, we hypothesized that the relationships between internalization of pro-anorexia website content and drive for thinness in women would be stronger than the relationships between general friend influence or general media internalization and drive for thinness in women. Indeed, the present study confirmed that the internalization of pro-

anorexia website content was a strong predictor of drive for thinness in women, contributing 30% of the variance, followed by general friend influence and the internalization of general media content, contributing an additional 9% and 2% of the variance, respectively. This is not surprising given previous research indicating that internalization of sociocultural standards of appearance significantly predict women's drive for thinness (Lokken et al., 2004). Again, however, it is unclear whether the peer support aspects of pro anorexia websites or the internalization of the images that appear on pro anorexia websites is more important as a predictor of drive for thinness, as both general media internalization and general friend influence were predictive of drive for thinness in the present study. Future research should delve further into this issue. Similarly, as the three variables only accounted for 41% of the variance, clearly other factors relate to drive for thinness in women. Future research should investigate this.

Overall, these findings suggest that women may be more susceptible to the influence of pro-anorexia websites than men, as internalization of pro anorexia website content accounted for three times the variance in women than in men. The results also showed that as friend influence to view pro-anorexia websites increases so does the internalization of pro-anorexia websites. Though the variables were moderately correlated, especially in women, it gives us an insight into the influence friends may have in the choices individuals make while in the college environment. Friends may still be significantly influencing the consumption and use of media in college students. However, it is important to note, friend influence to view pro-anorexia websites related to drive for thinness in women, but not drive for muscularity in men.

Limitations

The present study has several limitations that must be addressed. First, this study was correlational in nature; we cannot say whether the internalization of pro-anorexia website content causes drive for thinness or drive for muscularity. Another limitation is that the results were based on self-report survey data, which does not ensure complete honesty from the participants. Finally, the study was cross-sectional and not longitudinal. Future studies should follow young girls and boys as they begin to view more media images of ideal bodies and see if that translates into more disordered eating and exercise behaviors as they age.

Conclusion

Our study shows that while drive for muscularity in men is correlated with the internalization of pro-anorexia website content, drive for thinness in women has a stronger relationship with the internalization of pro-anorexia website content. Friend influence to view pro-anorexia websites correlated with the internalization of pro-anorexia website content; however friend influence to view pro-anorexia websites only related to drive for thinness and not drive for muscularity. Lastly, internalization of pro-anorexia website content served as a strong predictor of drive for thinness in women and the only predictor, albeit for a small percentage of variance, of drive for muscularity in men.

All in all, we believe the findings in this study will aid in the expansion of knowledge of pro-anorexia websites. Understanding what factors may lead to the development of disordered eating and exercise behaviors, specifically drive for muscularity and thinness, will allow for greater treatment methods and effectiveness. Knowledge in this area will also help address the increasing threat of the online realm on body image issues. Overall awareness of the effects of internalizing pro-anorexia website content will help the greater population educate individuals on the harmful effects of these websites. Future research should examine how the internalization of pro-anorexia website content can affect the development of disordered eating, as well as the eating disorders anorexia and bulimia.

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Table 1

Correlations between Friend and Media Internalization and Drive for Muscularity in Males

Measure	Mean(SD)	1	2	3	4	5
	Male					
1. Drive for Muscularity	3.70(.93)	--	.31**	.31**	-.04	.10
2. Pro-anorexia website internalization	1.75(.64)		--	.73**	.25*	.35**
3. General media internalization	2.24(.84)			--	.11	.29**
4. Friend Influence over pro-anorexia website viewing.	1.31(.65)				--	.56**
5. General friend influence	2.20(.62)					--

Note. A Bonferroni correlation was applied to the results presented in this table; only results with a $p < .005$ were considered significant. * $p \leq .005$, ** $p \leq .001$; CI = confidence interval

Table 2

Correlations between Friend and Media Internalization and Drive for Thinness in Females

Measure	Mean(SD)	1	2	3	4	5
	Female					
1. Drive for Thinness	21.10(8.4)	--	.5*	.54**	.26**	.51*
2. Pro-anorexia website internalization	2.33(.76)		--	.77**	.37**	.47**
3. General media internalization	3.02 (1.0)			--	.24*	.44**
4. Friend Influence over pro-anorexia website viewing	1.30(.59)				--	.52**
5. General friend influence	2.55(.81)					--

Note. A Bonferroni correlation was applied to the results presented in this table; only results with a $p < .005$ were considered significant. * $p \leq .005$, ** $p \leq .001$; CI = confidence interval

Table 3
Summary of stepwise regression analysis for the variables predicting drive for muscularity in men

Variable	<i>B</i>	<i>SE B</i>	β
Internalization of Pro-anorexia websites	0.45	0.13	.31**

Note: ** $p < .001$

Table 4

Summary of stepwise regression analysis for the variables predicting drive for thinness in women

Variable	<i>B</i>	<i>SE B</i>	β
<i>Step 1</i>			
Internalization of Pro-anorexia websites	6.14	0.73	.55**
<i>Step 2</i>			
Internalization of Pro-anorexia websites	4.30	0.80	.40**
General friend influence	3.50	0.75	.33**
<i>Step 3</i>			
Internalization of Pro-anorexia websites	1.91	0.56	.31***
General friend influence	1.95	0.62	.28**
Media internalization	2.11	0.80	.26*

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