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Longitudinal Course of Female Eating Disorder Risk at Brigham Young University

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BRIGHAM YOUNG UNIVERSITY

Three cohorts of entering freshman women were assessed over the course of four years at Brigham Young University (BYU). The Eating Attitudes Test (EAT-26) and the Body Shape Questionnaire (BSQ) were administered at the beginning of each fall and winter semester. Results showed (a) steadily decreasing average levels of eating disorder risk and body shape dissatisfaction over time, which was mirrored in each cohort; (b) significantly lower eating disorder risk than other college samples; (c) a typically high percentage of women with clinically significant body shape dissatisfaction; (d) significant correlation between the EAT-26 and the BSQ; and (e) notable subgroups (according to anticipated academic major) of higher-risk students. The findings suggest that, although body shape dissatisfaction was similar to estimated rates on other college campuses and the measure thereof was correlated with eating disorder risk, the overall level of eating disorder risk at BYU was lower than that reported on other college campuses. It is proposed that unique aspects of the BYU campus might mitigate the development of eating disorders.

Research has indicated that several aspects of college life are associated with increased risk of eating disorders in female students. For instance, studies of college campuses using the Eating Attitudes Test (EAT-26) have shown eating disorder risk rates ranging from 14% to 17% (Edwards-Hewitt & Gray, 1993; Kirk, Singh, & Getz, 2001; Prouty, Protinsky, & Canady, 2002; Forney & Ward, 2013). Further, a recent study by Forney and Ward (2013) based on the Body Shape Questionnaire (BSQ) reported a risk rate of 28.7% at a midsized midwestern university (J. Forney, personal communication, March 21, 2013). Simon-Boyd and Bieschke (2003) suggested that emphasis on academic achievement, competition, and attractiveness are particularly salient risks to vulnerable students. Boskind-White and White (1983) and Prouty et al. (2002) showed that Caucasian, reli-

gious, achievement-oriented females are at particularly higher risk for developing eating disorders.

Brigham Young University (BYU) is a church-sponsored university whose campus fits these criteria for a high eating disorder risk among young women. The student body is 86% Caucasian (Brigham Young University, n.d.). The school has a decidedly religious emphasis with a scripturally based honor code, a board of trustees primarily composed of ecclesiastical leaders, and a president who is both the institutional leader and a religious leader "called" to his position by the board of trustees. The stu-

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dent body is 98% Latter-day Saint (LDS). BYU has a very competitive academic environment with freshmen admitted in 2012 averaging 28.4 composite ACT scores and 3.81 high school GPAs (Brigham Young University, n.d.). It is unclear whether elevated risks at such campuses are “hotbeds” (attracting vulnerable or previously disordered students) or “breeding grounds” (encouraging the development of disorders in previously healthy students) for eating disorders. To estimate the comparative degrees of eating disorder risk for females on campus and to determine where to focus prevention efforts, a research team consisting of Student Life professionals, faculty, and graduate students conducted a longitudinal study of three cohorts of entering freshman women using both a measure of body shape dissatisfaction and eating attitudes. Both instruments were administered twice each year over the course of four years.

METHOD

PARTICIPANTS

A new cohort of 1,800 entering freshman women was randomly selected each year for three successive years. The three cohorts were assessed at the beginning of each fall and winter semester for four years, three years, and two years, respectively. The average age of the women was 18.2 years with a range of 18-24. The initial response rate averaged 36% with steady subject mortality over the course of time. Table 1 indicates the response rates for each cohort across the four years.

INSTRUMENTS

The Eating Attitudes Test (EAT-40; Garner & Garfinkel, 1979) was administered to all participants twice each year. Participants' risk scores were calculated using all 40 items on the EAT-40 as well as the subset of 26 items on the EAT-26 recommended by Garner, Olmsted, Bohr, and Garfinkel (1982). Garner et al. demon-

strated that the EAT-26 was highly correlated with the EAT-40 ($r = 0.98$). The current researchers calculated the EAT-26 scores to allow comparison of this sample to other college samples that were administered only the EAT-26. The EAT-40 has rendered internal consistency coefficients of 0.79 for anorexic patients and 0.94 for control (nondiagnosed) subjects. Mintz and O'Halloran (2000) showed that the EAT was 90% accurate at differentiating between diagnosed and nondiagnosed college-age women. The clinical cut score on the EAT-40 is 30. The clinical cut score on the EAT-26 is 20. Participants whose scores were above the cut scores were considered to be at risk for manifesting an eating disorder. The EAT-40 and EAT-26 are used to support diagnoses of eating disorders.

The Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) does not globally measure eating disorder risk but rather focuses on one important correlate of eating disorders. It is a “self-report measure of concerns about body shape, in particular the phenomenal experience of ‘feeling fat’” (p. 490). Cooper et al. reported excellent concurrent validity of the BSQ with the Body Dissatisfaction subscale of the Eating Disorders Inventory ($r = 0.66$). Rosen, Jones, Ramirez, and Waxman (1996) reported that the temporal stability of the BSQ met accepted standards ($r = 0.88$) and showed excellent concurrent validity with the Body Dysmorphic Disorder Examination administered to college-age women ($r = 0.77$). Participants whose BSQ scores exceeded 110 were considered to have significant body image concerns.

A demographics questionnaire asked incoming freshman women to self-report their age, residence, collegiate sports participation, dance team participation, and anticipated choice of college major. The anticipated majors were grouped according to similar subject matter and collapsed by the researchers into 20 major categories sponsored by the university.

Table 1. Number of Participants in Each Semester, by Group

COHORT	FRESHMAN		SOPHMORE		JUNIOR		SENIOR	
	FALL	WINTER	FALL	WINTER	FALL	WINTER	FALL	WINTER
1	658	487	342	272	185	162	102	102
2	696	499	269	256	186	194		
3	572	321	199	241				

PROCEDURE

Each year, for three years, 1,800 incoming freshman women were randomly selected and mailed the demographics form, the EAT-40, and the BSQ at the beginning of their first fall semester. The instruments were mailed again at the beginning of the winter semester. This pattern was repeated at the beginning of fall and winter semesters for four years. The first cohort was sampled eight times. The second cohort was sampled six times. The third cohort was sampled four times. In the third year of the study, after all participants were enrolled and familiar with the instruments, the instruments were e-mailed to participants to decrease the burden of completing hard copies and mailing them back to the research team.

RESULTS

Estimates of psychopathology typically distribute with significant positive skew. Results of all measures (EAT-40, EAT-26, and BSQ) distributed with significant positive skew. Critical Ratio Tests of skew for the EAT measures ranged from 37.6 to 7.4. There was a clear pattern of decreasing skew over time, which indicates progressive normalization of the EAT distributions, but the distributions were still significantly skewed. Critical Ratio Tests of skew for the BSQ ranged from 8.3 to 2.4. As with the EAT measures, there was a clear pattern of decreasing skew over time, which indicates progressive normaliza-

tion of the BSQ distributions. Because the BSQ is not a measure of psychopathology, the reduced skew relative to the EAT measures was expected. Nevertheless, the last samples of the BSQ were still significantly skewed. Rather than report mean values, which are destabilized in skewed distributions and may misrepresent phenomena, results are reported here in terms of percentages of students who scored in the clinical range for the EAT and the BSQ. Because the patterns of risk estimated by EAT-40 and EAT-26 were very similar, only the EAT-26 results are reported.

The longitudinal course of eating disorder risk and body dissatisfaction seemed to follow the same trend across all three cohorts. As seen in Tables 2 and 3, the percentage of students in clinical (at-risk) ranges steadily declined over time.

These values were collapsed across all samples and cohorts to estimate the typical risk according to year in school. As seen in Table 4, freshman women were at greatest risk according to both the EAT-26 and the BSQ. Risk rates steadily declined across year in school.

These data were further collapsed to estimate a single risk rate of eating disorders for female students on BYU campus. Estimates were generated in two ways: weighted and unweighted. The weighted risk rate is based on the total number of questionnaires completed regardless of cohort or year in school (N ~ 5700). Because of subject attrition over time, the weighted risk overrepresents underclassmen, who have higher rates of eating disorder

Table 2. Percentage of Women in At-Risk Range by Group Based on the EAT-26

COHORT	FRESHMAN		SOPHMORE		JUNIOR		SENIOR	
	FALL	WINTER	FALL	WINTER	FALL	WINTER	FALL	WINTER
1	14.0	12.5	10.3	12.8	6.9	3.9	7.8	7.8
2	12.7	11.3	9.3	8.4	8.1	5.2		
3	11.3	10.8	10.1	13.7				

Table 3. Percentage of Women in At-Risk Range by Group Based on the BSQ

COHORT	FRESHMAN		SOPHMORE		JUNIOR		SENIOR	
	FALL	WINTER	FALL	WINTER	FALL	WINTER	FALL	WINTER
1	34.5	32.8	31.3	30.5	20.2	23.7	19.2	22.8
2	31.8	30.9	25.8	30.8	25.3	25.8		
3	37.0	39.1	32.2	30.2				

Table 4. Year-In-School Percentage in At-Risk Range Based on the EAT-26 and BSQ

MEASURE	FRESHMAN	SOPHMORE	JUNIOR	SENIOR
EAT-26	12.1	10.8	6.0	7.8
BSQ	33.5	30.0	23.8	21.0

risk. The unweighted risk is based on the average of the year-in-school averages and compensates for the overrepresentation of underclassmen.

Based on the EAT-26, the single weighted risk rate was 10.8%, and the unweighted risk rate was 9.2%. Single-sample z tests of proportions using the average annual sample size of 690 showed that both the weighted and unweighted risk rates were significantly lower than a conservative estimate of 15% based on risk rates recorded on other college campuses. The z was -3.0 ($p = .0013$) when testing against the weighted risk rate of 10.8% and -4.1 ($p = .00003$) when testing against the unweighted risk rate of 9.2%.

The single weighted risk rate based on the BSQ was 31.1%, and the unweighted risk rate was 27.2%. Single-sample z tests of proportions using the average annual sample size of 720 showed that the weighted and unweighted risk rates were not significantly different than a recent estimate of 28.7 at a midsized midwestern university. The z was 1.4 ($p = 0.0808$, NS) when testing against the weighted risk rate of 31.1% and -0.88 ($p = 0.1894$, NS) when testing against the unweighted risk rate of 27.2%.

Because of the extreme skews in all distributions, the estimates of the relationship between the EAT and the BSQ were based on Spearman's Rho. Depending on the point in time or cohort used, coefficients ranged from 0.61 to 0.72 with an average Spearman's Rho of 0.67.

After considering the overall risk, the research investigated whether there were specific subgroups that represented notably higher risk. Participants were separated into 20 subgroups according to their anticipated major in the fall semester of their freshman year. Whether students maintained those majors over time is undetermined. Subgroups were ranked according to risk, which was estimated in multiple ways, including mean values, median values, and percentage of students scoring above critical cutoffs on the EAT or BSQ. Based on the first-semester declared major and across multiple estimates, six subgroups emerged as having notable risk. The six academic-major groups at higher risk were dance, com-

munications, dietetics, physical education, theater, and business. The three academic-major groups at lower risk were engineering/technology, math/science, and biology.

DISCUSSION

Although BYU students possess many of the attributes typically associated with elevated levels of eating disorder risk, this study shows that BYU female students displayed significantly lower risk than female students on other college campuses. Additionally, BYU women entered the university at their highest level of risk in the fall of their freshman year and then steadily declined in risk throughout their time on campus. It is notable, however, that BYU women's level of body shape dissatisfaction was similar to a trustworthy estimate from another college campus. This is consistent with Carroll and Spangler's (2001) finding that female LDS college students had body image issues that were similar to their non-LDS counterparts. Both groups seemed to have been influenced by the media's thin ideal. However, in a subsequent study, Sandberg and Spangler (2007) found that female LDS college students had lower BSQ scores than their non-LDS counterparts. Across the three samples, the BYU or LDS women were estimated to have the same or better body images than non-BYU or non-LDS women.

Although body shape dissatisfaction is an important component of eating disorder risk, and the correlations between the EAT and the BSQ were quite high, the actual level of eating disorder risk for BYU female students was significantly lower than for female students on other college campuses. Women who scored high on BSQ tended to score high on the EAT. However, correlations ignore mean values and do not estimate actual levels of risk. In this case the apparently typical high body shape dissatisfaction did not result in typical levels of eating disorder risk. In fact, the estimated risks of BYU women's eating disorders were significantly lower than expected.

There are several possible explanations for why a college campus with many of the markers that predict elevated

risk for eating disorders would have scores that were lower than expected. One reason may be that Student Life prevention efforts are effective. Women's Services and Resources (WSR) sponsors eating-disorders prevention programming throughout the school year that addresses eating and body image problems. All of this programming is under the umbrella of WSR's yearlong *Recapturing Beauty* campaign. The campaign includes:

- **The 10-Day Body Image Challenge.** Held at the beginning of each school year, this program focuses on body image. The challenge includes one exercise each day that encourages students to address the way they view themselves and helps them develop a greater love and appreciation for who they are as divine beings. The exercises shift focus away from the messages of the world to define beauty from an internal standard.
- **A Week of Mindful Eating.** The purpose of this activity is to educate students about the dangers of dieting and teach them about intuitive eating, an approach that focuses on being attuned to their bodies and learning to recognize hunger and satiety signals rather than being dictated by an external authority regarding how to eat.
- **National Eating Disorders Awareness Week.** This event includes a variety of activities to educate students about eating disorders, including how to recognize the signs and symptoms of eating disorders and how to help themselves or a loved one who is dealing with an eating disorder. Activities include an array of lectures about body image and the media, media literacy, perfectionism, and self-esteem.
- **Fed Up with Food.** "Fed Up" is a weekly support group for students who want to have a healthy view of themselves and a healthy approach to eating. Weekly discussions provide participants with skills to challenge thinking and attitudes that lead to problematic eating and to empower them to be true to themselves.
- **Confidential Consultations.** Confidential consultations are available for students struggling with depression, anxiety, body image issues, or eating problems. Consultants assess needs and provide information, making referrals to the counseling center as needed.
- **Nutrition Consolations.** Nutrition consultations help students determine healthy eating patterns, and

portion sizes, create variety in their meals, and plan healthy meals, and snacks.

- **Lecture Series.** Occasionally WSR hosts speakers who have overcome eating disorders and are willing to speak about their journey and what approaches helped them. Speakers address theology regarding the doctrine of the body, the role of our physical bodies in our salvation, and the sacred stewardship of the body. These lectures help students to have a reverence and healthy respect for the body.

WSR's activities are ongoing throughout the school year and can be reviewed at recapturingbeauty.byu.edu.

Another reason for lower-than-expected eating disorder risk might be BYU's unique social structure. One of the ecological factors associated with eating disorder risk for college-age women is the removal of intimate family and social support. Leaving home and entering a competitive academic environment without social support can elicit the onset or exacerbation of eating disorder symptoms (Vohs, Heatherton, & Herrin, 2001). The BYU experience may be atypical in this regard. All students are assigned to a geographically based ward (church congregation). Within the ward system, students have extensive social support in the form of bishops (pastors), home teachers (males assigned to visit and support specific ward members on a monthly basis), visiting teachers (females assigned to visit and support specific female ward members on a monthly basis), home evening groups (small groups of males and females that meet every Monday evening for activities and shared worship), weekly congregational worship services, and ward-wide service and recreational activities on a monthly basis. All students receive and provide social support for each other through the ward system. The enhanced opportunity to have satisfying social and interpersonal relationships may be a protective factor against eating disorder risk.

Another reason for lower-than-expected eating disorder risk might be the predominant doctrine taught in The Church of Jesus Christ of Latter-day Saints (LDS). In LDS doctrine, the physical body is considered essential for eternal progress and is to be treated with care and reverence. The concept that the body is sacred and is a receptacle of divine presence is clearly taught. For example, tattoos are eschewed and considered analogous to writing graffiti on a temple building. Body piercings are to be avoided. It is not inconceivable that the same logic that prompts individuals to revere and protect their physi-

cal bodies would be a protective factor against many of the outward symptoms of eating disorders. Binging and purging, laxative abuse, or severe dietary restrictions may be seen as harmful to the sacred body. Carroll and Spangler (2001) opined that the doctrine of the sacredness of the body might be more salient for men than women. They also proposed that while the doctrine may be equally salient for men and women, it could be compromised more for women because of the power of the thin ideal in the media. Nevertheless, samples show that BYU females are faring better than non-BYU females, and it may be due to religious doctrine. There is also very specific scripture within the LDS belief system, called the Word of Wisdom, that provides both proscriptions and prescriptions regarding substances that should be avoided and food that should be eaten to enhance spiritual and physical health. Of course, doctrine can be distorted in the thoughts of a student suffering from eating disorder symptoms and ironically used as a rationalization that perpetuates unhealthy behavior. However, the young women on BYU campus may be benefitting from the predominant doctrinal messages within the LDS church.

Another related factor might be addresses by ecclesiastical leaders and publications of the LDS church that have moved beyond the general doctrine of reverence for the body to specifically referencing eating disorders. For example, in the 2001 article "Who Do You Think You Are?—A Message to Youth," James E. Faust of the First Presidency of the LDS church advised:

In your quest to define yourselves, do not get caught up in comparisons with role models or body types that may seem to be macho or chic but in reality are not becoming to you as sons and daughters of our loving Heavenly Father. One 17-year-old girl became so obsessed about her figure that she began to skip meals and ended up with an eating disorder. When it became apparent to her father, he insisted that she eat a substantial meal. This confrontation eventually brought her to her senses. (p. 4)

Also, an article in the *New Era*, which is a monthly publication dedicated to adolescent members of the church, focused specifically on eating disorder risk (Maynes, 2006). The author highlighted warning signs and listed helpful resources. Letters to the editors of LDS church magazines openly reference eating disorders and acknowledge the salutary influence of some articles and talks. For example, in the October 2005 *Ensign* (which is a monthly publication for adult members), a reader wrote:

Thank you for your July 2005 article "The Body, a Sacred Gift." For more than seven years an eating disorder has been the lens through which I see my body. My battle to turn to the Lord and the healing power of the Atonement was considerably aided by your article and its timing. I appreciate your constant sensitivity to today's problems and your courage in addressing them. (p. 79)

Another reader wrote in the September 2006 *Ensign*:

I want to thank you for the article "My Battle with Anorexia." I had kept my eating disorder secret for a long time and this article helped me realize that what I was doing did not coincide with the gospel and hurt me spiritually, though I would have never admitted it. (p. 48)

Any one or a combination of such unique factors in the BYU ecology may be influencing the diminished risk of eating disorders on campus. Although it is clear that the thin-ideal message promulgated by the popular media is having the same impact on body dissatisfaction of BYU females as measured by the BSQ, the risk rates of their self-reported eating disorder symptoms as measured by the EAT are less than those estimated on other college campuses. Although one or a combination of such unique factors in the BYU ecology are not completely effective, as BYU still has a 9% to 10% overall risk and some subgroups are at higher risk, something in the ecology seems to be blunting the expected risk.

We have speculated about the surprising findings in this study. Perhaps the most effective design that can explore what ecological factors might be at play will be a qualitative study utilizing in-depth interviews of BYU women at the various stages of their academic careers. There may be developmental processes as well as ecological influences that are only accessible through qualitative inquiry. Qualitative design can be used for confirmatory purposes and is not limited to exploration only. Such a study is strongly recommended.

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