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EATING DISORDER RISK IN SUBGROUPS OF COLLEGE FRESHMAN WOMEN

by

Karen Gochnour

A thesis submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Educational Specialist in School Psychology

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BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

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The thesis has been read by each member of the following graduate committee and by majority votes has been found to be satisfactory.

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BRIGHAM YOUNG UNIVERSITY

As chair of the candidate's graduate committee, I have read the dissertation of Karen E. Gochnour in its final form and have found that (1) its format, citations, and bibliographical style are consistent and acceptable and fulfill university and department style requirements; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the graduate committee and is ready for submission to the university library.

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ABSTRACT

EATING DISORDER RISK IN SUBGROUPS OF COLLEGE FRESHMAN WOMEN

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The intent of this study was to identify subgroups within the college population having a heightened risk for eating disorders. The information for this analysis was retrieved from an existing data set. The two variables that were compared were self selection of college major at the initial collection during freshman year. The sample size of 1,924 was used to see if subgroups of college majors had a heightened risk. Twenty groups composed of similar majors were studied. The majors of Dance, Dietetics, Physical Education, and Communications had heightened risk according to analysis percentage of each group in the clinical range on the Eating Attitudes Test-40 (EAT-40), EAT-40 mean, and/or EAT-40 median. Results indicate that Dance, Dietetic, Physical Education, and Communications would merit additional resources to prevent eating disorders at the college level.

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TABLE OF CONTENTS

Abstract	iv
Acknowledgments.....	v
Table of Contents.....	vi
List of Tables.....	ix
Introduction.....	1
Statement of Problem.....	4
Statement of Purpose.....	4
Literature Review.....	5
Character Traits.....	8
Perfectionism.....	8
Competition.....	9
Stress.....	9
Autonomy.....	9
Family Life.....	10
Gender Roles.....	11
Environment.....	11
College Variables.....	11
Dance Majors.....	12
Dietetics Majors.....	14
Culinary Arts Majors.....	14
Freshmen.....	16

Statement of Problem.....	16
Statement of Purpose	16
Methods.....	17
Participants.....	17
Instruments.....	18
Demographic Questionnaire.....	18
EAT-40.....	18
Data Analysis.....	22
Results.....	24
Percentage of Subjects in Clinical Range by Subpopulation.....	24
Mean on the EAT-40 by Subgroup.....	26
5% Trimmed Mean on the EAT-40 by Subgroup.....	28
Median on the EAT-40 by Subgroup.....	29
Summary of Percent, Mean, and Median.....	30
Discussion	32
High Risk.....	32
Dance	33
Dietetics.....	33
Physical Education	36
Communications.....	37
At-Risk.....	38
Limiting Characteristics of the Sample.....	40

Conclusion.....	42
Future Research.....	42
References.....	44
Appendix A.....	47
Appendix B.....	50

LIST OF TABLES

Table 1. Demographic Questionnaire Groupings of Majors.....	19
Table 2. Results of the Study.....	25
Table 3. Risk Rate Based on High Percentage of Persons with Clinical Scores Within Subgroups.....	26
Table 4. Risk Rate Based on Mean	28
Table 5. Risk Rate Based on 5% Trimmed Mean.....	29
Table 6. Risk Rate Based on Median	30

Introduction

Eating disorders are devastating to the mind, body, and relationships of those struggling with them. In 1987, Mitchell and Eckert claimed that eating disorders “are increasing in incidence” and “are associated with serious medical, psychological, and societal consequences” (p. 628). Almost twenty years later, the presence and pervasiveness of eating disorders continue to plague society. Research efforts are devoted to addressing the complexity of causes, contributing elements, and descriptive characteristics of a person with an eating disorder. In addition, prevention efforts are aimed at reducing eating disorders. These efforts are costly and knowing where to target them is essential in maximizing resources and increasing the effectiveness of prevention. The knowledge of high risk concentrations of people who suffer from eating disorders would aid in this endeavor and help tailor those resources to those who need it most.

School is a natural arena for prevention efforts because eating disorders begin during early childhood and extend to young adulthood, a time when most people receive formal education. Within the school environment there are many groups that can be studied. Hamli, Falk, and Schwartz (1981) documented increased risk in the college population. Within the college population, Winters (2005) demonstrated that freshman women were the highest risk group and that risk diminished across the course of the college career. Within the female freshman population it is still unclear whether there are pockets of particularly high risk groups. Attending college differs from elementary education, because it is regarded as a self-selecting environment. Self-selection according to college major may be a marker that predicts high risk subpopulations in this setting.

Recovery from eating disorders can last years and many do not recover. The U.S. Department of Health and Human Services (2002) states “the death rates are among the highest for any mental illness” (§ 4). Steinhausen (2002) explored 10 cohort studies of anorexia and reported bleak findings. He stated that “less than a half of the patients, or exactly 46%, fully recovered from anorexia nervosa, whereas a third improved with only partial or residual features of anorexia nervosa, and 20% remained chronically ill over the long term” (p. 1288). In addition he notes that “crude mortality rates were high and increased significantly with length of follow up” (p. 1288). Noting the severity of the disease, Hewit, Coran, and Steel (2001) conservatively reported mortality rates from U.S. death records collected between 1986 and 1990. In the age group 15-24, there were 62.9 out of 100,000 deaths per year for women due to eating disorders. Long recovery, partial recovery, and years spent with the disease takes a toll on the victims. Treasure and Schmidt (2005) documented a wide range of damage to the bodies and brains of women that live with the disease. Currin and Schmidt (2005) note that

the eating disorder field has been slow to embrace the concepts of early intervention and to carry out studies relevant to these ideas. This is surprising as...there are clear biological mechanisms which makes it likely that a prolonged duration of this disorder may have deleterious effects on different body systems and organs and may make full recover less likely. (p. 620)

With these findings it is difficult to ignore the seriousness of the disease.

Society is responding to the existence of this disease, but on-going efforts are needed. The U. S. Department of Health and Human Services Office of Women’s Health is involved in prevention and has sponsored a campaign, Body Wise, to educate young

students on eating disorders (U. S. Department of Health and Human Services, 2000). Given the high mortality rate and damage caused by this disease, social service agencies and colleges have instituted costly prevention and education efforts. National Eating Disorders Awareness week is advertised on college campuses across the nation (National Eating Disorders Association, 2006). Women's Services and Resources at Brigham Young University conduct prevention and education efforts year round. In order to better focus resources and prevention efforts, research has been conducted to identify the overall risk and longitudinal course of eating disorders on college campuses (Costello 1999, Lewinsohn, Striegel-Moore, & Seeley, 2002).

According to the American Psychiatric Association (2000) as designated in the Diagnostic Manual of Mental Disorders (4th ed., text revision), *DSM-IV-TR* anorexia usually starts in early adolescence with onset between the ages of 13 and 18, bulimia's onset is in late adolescence to early adulthood which coincides with the time that a person goes to college. Lewinsohn et al. (2000) comments on the emergence of anorexia nervosa (AN) and bulimia (BN), "it appears that the first occurrence of AN takes place almost exclusively during adolescence, whereas risk for onset for BN extends into young adulthood" (p. 1290). Most women attend college during young adulthood and studying this time period could provide insight into risk factors.

Winters (2005) demonstrated that freshman women are the highest risk group at Brigham Young University. One question that Winters' research did not provide was whether particular subgroups in the freshman group were vulnerable. It is reasonable to question whether the data would reveal information about subgroup risk using the highest identified risk population, freshman women. This population is also at-risk, just based on

their age for both anorexia and bulimia. Since they are incoming freshmen, their choice of major is not influenced by variables within the campus. Their choice of major as they enter college represents a natural self selection.

Some research has demonstrated that the self-selection process inherent in the selection of a college major may predict congregations of high risk populations (Conner-Greene, Striegel-Moore, & Cronan, 1994; Crocket & Littrell, 1985; Reinstein, Kozewski, Chamberlain, & Smith-Johnson, 1992). As high risk subgroups are identified, prevention efforts may be focused, enhanced, and delivered more efficiently.

Statement of Problem

Eating disorders are extremely damaging with a devastatingly high mortality rate (Currin & Schmidt, 2005; Hewit, Coran, & Steel, 2001; Steinhausen, 2002; Treasure, & Schmidt 2005). Additionally, prevention efforts are costly and need to be directed toward target populations. Some researchers have identified that the freshman year is the highest risk period for college age women (Reinstein et al., 1992; Winters 2005). It is unclear whether subpopulations of freshman women may be at particularly high risk and can be identified according to their college major.

Statement of Purpose

The purpose of this study is to explore the eating disorder risk of a sample of freshman women according to their initial declared major. The intent is to identify high risk groups. This will help to direct resources to those groups.

Literature Review

For discussion of the college eating disorder experience, it is necessary to begin with the clinical definition of eating disorders according to the *DSM-IV-TR*. The criteria for *Anorexia Nervosa* includes the refusal to maintain body weight less than 85% of what is expected, an intense fear of gaining weight even though the person is underweight, denial of seriousness or weight connected to self evaluation, and amenorrhea (APA, 2000). This can be caused by restricting food or bingeing and purging.

For *Bulimia Nervosa* the criteria includes recurrent binge eating with a sense of loss of control, compensatory behaviors (nonpurging or purging) to prevent weight gain occurring at least twice a week for three months, and weight or body shape unduly contributing to self evaluation (APA, 2000). *Anorexia Nervosa* and *Bulimia Nervosa* cannot exist at the same time, but may look similar in behavior. The difference is that people with *Anorexia Nervosa* are underweight, whereas people with *Bulimia Nervosa* are within their normal weight range or are overweight however their behaviors may be similar.

Eating Disorder Not Otherwise Specified (EDNOS) may include parts of *Anorexia Nervosa* and *Bulimia Nervosa*, but not meet the full criteria for either disease. This category complicates the identification of eating disorders (APA, 2000). People with EDNOS will display noticeable variations from normal eating habits (APA, 2000). *Eating Disorder Not Otherwise Specified* may include binge eating disorder characteristics. Binge eating disorder has not been formally defined at this time. According to the *DSM-IV-TR*, the prevalence for females of *Anorexia* is .5% and the prevalence of *Bulimia* is 1-3% (APA, 2000). The prevalence is higher when *Eating Disorder NOS* is included with

other eating disorders. Eating disorders primarily affect women, although they do affect men to a small degree.

To further blur the demarcation of normal behavior, there is a range of eating behaviors reported. Mintz and Betz (1988) found eating disorders to be fairly common in the college population. Their study revealed that

only 33% of college women could be classified as normal eaters..., whereas 64% fell midway between normal and bulimic, (this) indicates a problem of major proportions among college women. In essence, this study suggests that in terms of disturbed eating behaviors, “normal” is not “normative”-rather what is normative among college women reflects to at least some degree less than healthy eating behavior. (Discussion, ¶ 4)

This finding has been supported by other research. Heatherton, Mohamedi, Striepe, Field, & Keel, (1997) add that at least some degree of disordered eating may be normative for college women (p. 124). These studies enlarge prevalence rates, departing from what is reported for the total population which is .5%-3% for Anorexia and Bulimia respectively according to the *DSM-IV-TR* (APA, 2000). In a college sample studied by Gray and Ford (1985), they found “13%... of the female respondents met the DSM-III criteria for bulimia” and “61% of female nonbulimics admitted to some form of binge eating” (p. 204-5). This would indicate a higher bulimic population than would be expected in the general population, but also notes that bulimic behavior is fairly common within the college environment. Mitchell and Eckert (1987) indicate that “eating disorders are unique because they represent the only common type of psychopathology in which an

environmental variable (culture) appears to be a major factor in determining the prevalence of the condition” (p. 632).

Factors in the college environment seem to contribute to disordered eating. Students dealing with the stressors of college can turn to unhealthy eating behaviors to cope with the pressure or utilize unhealthy practices in response to body image issues. The transition to college is a stressful time. For some it is a return to disordered eating when they encounter stress.

Due to the multi-factor etiology in any mental disorder it is difficult to say that there is one cause, but both the environment and the genetic predisposition contribute to the occurrence of eating disorders. College is generally a time with significant pressure that would naturally produce experimentation with alternative coping mechanisms, some of which have the potential to be self-destructive, such as drinking, promiscuity, and disordered eating. Other changes such as relationships and support systems shift from family to roommates and friends.

Schwitzer, Bergholz, Dore, and Salami (1998) stated that “a clearer picture of the prototypical eating-disorder NOS candidate among young adult women is developing” (p.3). Common characteristics include

reporting a version of the notion, ‘I don’t have an eating disorder, but I think about food all of the time;’ being knowledgeable counters of calorie and fat levels, highly scale oriented, and frequent weighers; engaging in secretive eating; engaging in excessive exercise or rumination about exercise; resisting nutrition education; exhibiting common fluctuations in weight; and experiencing moderate depression and low self-esteem. (p.3)

These characteristics may have implications for self-selected college major choice. Some majors have curriculum that includes caloric and nutritional information or information about exercise, this could have implications for eating disorder risk.

Character Traits

Researchers are narrowing the field by identifying certain characteristics of people with eating disorders to assist practitioners in prevention, treatment planning, and resource allocation. In addition to the clinical criteria, researchers have sought to identify co-occurring characteristics including, perfectionism, competition, stress, autonomy, family structure, and environment factors. These studies have attempted to identify specific elements that play into the whole picture of eating disorders. They provide other variables that help locate people at-risk for eating disorders.

Perfectionism

Perfectionism is a characteristic that has been identified existing in people with eating disorders. Ashby, Kottman, and Shoen (1998) state that individuals being treated for eating disorders scored significantly higher than noneating disordered individuals on the factor labeled Maladaptive Perfectionism, but not on the factor labeled Adaptive Perfectionism. These results suggest that individuals with eating disorders may be more perfectionistic in maladaptive ways (e.g., overconcern over mistakes, anxiety about performance, and procrastination) than individuals without eating disorders. Individuals with eating disorders do not seem to be more perfectionistic in adaptive ways (e.g., high personal standards and a need for order and organization than those without eating disorders. (p. 268)

Maladaptive perfectionism may be a characteristic associated with some college majors and college campuses than others. It may also be a predictor of eating disorder risk.

Majors that are very detail oriented or have performance elements may have implications for people with eating disorders.

Competition

Competition is another characteristic that has been identified in eating disordered individuals. Some reports of people with eating disorders include feelings of being able to withstand long periods without food or an intense exercise schedule. Burckle, Ryckman, Gold, Thornton, and Audesse (1999) suggest that hypercompetitiveness is associated with eating disorder risk, but that general competitiveness is not.

Stress

Stress plays a role in eating disorders. Heilburn and Putter (1986) noted their findings were “consistent with primary clinical observations of anorexic cases that have emphasized the role of stress in this maladaptive eating syndrome” (p. 1045). Another point to contemplate is environment specific stress. Dickstein (1989) comments on how pressures related to school can increase anxiety and contribute to stress (p.111). It may be that certain college majors are inherently more stressful than others.

Autonomy

The definition of Bulimia Nervosa includes the experience of “feeling out of control” (APA, 2000). This directly relates to a sense of autonomy. Frederick and Grow (1996) found “that underlying deficits in autonomy were associated with reduced self-esteem, which, in turn, was related to eating disordered attitudes and behavior” (p. 224). Additional support is found in an article by Grayson and Medalie (1989) which notes that

“the internalized tension between women’s need for giving and receiving nurturance and for autonomous achievement is expressed in various symptoms such as work inhibitions, substance abuse and eating disorders. The current high prevalence of eating disorders may be understood as attempts to gain control over insistent needs to be nurtured by turning to food rather than comfort from other persons” (p. 105). Perceived autonomy is distinguished as a variable to heighten awareness. Eating disorders can stem from controlling what a person consumes because of reported feelings of being out of control. Autonomy, but more specifically the internal tension that Grayson and Medalie (1989) discuss may exist in some subpopulations. Issues surrounding giving and receiving nurturance may have implications for choice of college major. Those college majors that deal with service professions may vary from the general population, either because they are able to balance that need or they are using their career to balance their need to give and receive nurturance while maintaining autonomy.

Family Life

Family life also appears to influence eating disorders. It is intertwined with many other variables because it is an environment in and of itself. Hart and Kenny (1997) comment on this enmeshed variable, “We found that characteristics of secure attachment coupled with achievement strivings were positively associated with self-perceptions of social confidence, feelings of personal effectiveness, interpersonal trust and introceptive awareness, as well as somewhat negatively associated with body dissatisfaction and bulimic behavior” (p. 474). This would suggest when the family environment is healthy and strong there is a reduced tendency for eating disordered behavior. At the college level that family variable is often disrupted as many students leave home and live on their own

for the first time. Family stability might have some implications for when students start college because of this shift or existing family variables.

Gender Roles

Gender roles may be associated with the development of eating disorders. Kashubeck, Walsh, and Crowl (2001) stated that “femininity was positively correlated with several eating disorder scales” (p. 644). This is supported inversely by Snyder (1996), who found that “women identifying with feminist values expressed less dissatisfaction with their body weight and overall figure size, less concern about thinness, fewer bulimic tendencies, and fewer feelings of ineffectiveness” (p. 596-7). The degree to which women identify with traditional stereotypes plays into the equation. Gender roles have some implications in the development of eating disorders. Some college majors may lend themselves to traditional gender role patterns. And others may defy gender role patterns and therefore vary from the whole population in terms of the presence of eating disorders.

Environment

The environment is the most complex and encompassing variable, which includes all of the characteristics listed above; perfectionism, stress, competition, autonomy, family life, and gender roles. Specific environments have been the focus of several areas of research, most likely due to noticeable indication of disordered eating.

College Variables

So what do we know about the specific college subpopulations and professions that have higher prevalence rates? In the United States, with some limitations students choose the colleges they want to attend. This differs from some countries, where students

are selected to fields where they show the most proclivity for success. There are many different reasons for attending a particular college; possible narrowing factors include admission, accreditation, economic advantage, proximity, and social factors. Despite these limitations it is still considered a personal choice. The same is true for choice of major, while there may be outside pressures such as gender roles and family expectations, the field of study is considered to be the choice of the student. Although those pressures might be very strong and influence the decision the student makes.

Connor-Greene et al.(1988) wonders if “women seek out particular clubs, groups or sororities that share and reinforce their level of concern about appearance” (p. 127). This is an intriguing question when looking for at-risk populations and could be a factor in the self-selection of college majors.

What groups have already been subjected to scrutiny in regards to eating disorders? Specific college environment previously studied include the fields of dance, dietetics, fashion merchandising, and culinary arts; all have heightened risk except for fashion merchandising (Reinstein et al., 1992; Joseph, Wood, & Goldberg, 1982; Crocket & Littrell, 1985; Hodges, Stellefson, & Jarrell, 1999; Peterson, Phillips, & Steinhaus, 1996; Connor-Greene, Striegel-Moore, & Cronan, 1994). While these groups have received literary attention, other groups not yet identified may exist that have similar rates of risk.

Dance Majors

For women, a slender body is considered to be a prerequisite to being a dancer. In a group where slenderness is a defining characteristic, some people question the healthiness of dancers because they are so much thinner than the normal population.

Acknowledged in literature is the question whether dancers are a group at higher risk for eating disorders. The DSM-IV reports 1-3% prevalence among the total population, although on the college campus prevalence is reported between 13% (APA, 2000; Hamli et al., 1981). This is a stark contrast with what researchers have noted. Connor-Greene, et al. (1994) comments on the results of other researchers:

Brooks-Gunn, Warren, and Hamilton (1987) found that 33% of ballet dancers had a history of anorexia and bulimia. Among another group of dancers, Garner, Garfinkel, Rockert, and Olmsted (1987) found that 26% were anorectic and 14% were bulimic. Although these percentages are striking, it is important to note that the majority of the dancers did not have eating disorders. Clearly, the environment itself is not a sufficient causal factor in eating disorders. Many girls and women, even those who are members of “high risk” groups such as ballet dancers, never develop disordered eating despite considerable social pressure for thinness.

(p. 127)

While Connor-Green et al. (1994) discounts that the environment is causing the eating disorder, she notes the risk. A subpopulation with a significantly increased risk would be a target for prevention efforts. Additional analysis of this population may yield results to support Connor-Greene et al. (1994) or produce contrary results. Both studies showed a high percentage of the dance population at-risk for eating disorders. Joseph et al. (1982) also posits that “it is possible that these individuals had a propensity for developing anorexia nervosa because of their attitude toward thinness and were attracted to dance because it indulged this attitude” (p. 57). This notion indicates that self selection may help to identify at-risk populations.

Dietetics Majors

One study that focused on nutrition students found that “students entering college with dietetics or nutrition as their chosen major are at a higher risk of having an eating disorder” (Reinstein et al., 1992, p. 952). This may seem contrary since the point of studying nutrition would be to provide nutrients to the body. The knowledge that they gain in this major may be used to *feed* the disorder or perseverate on the subject that consumes their thoughts. In a study by Crockett and Littrell (1985) dietetics majors exhibited more positive behaviors and more negative behaviors. “Dietetic majors had higher scores on the positive eating habits scale more frequently than did social science/humanities majors” and “dietetic students had significantly higher scores on the vomiting scale than did home economics education majors” (p. 49). This particular study included three different majors and found the following information, “the percentage of each major that reported never vomiting after stuffing themselves was 80%, 94.9%, and 97.5% dietetic, social science/humanities, and home economic education majors, respectively” although these differences were not statistically significant (p. 49). Dietetic students seem to be more extreme in healthy and unhealthy eating practices.

Culinary Arts Majors

Another population that showed a higher incidence of eating disorders was culinary arts. Hodges et al. (1999) found that 5% of female students in culinary arts had BN which is higher than general prevalence rates (p. 49). They also conclude that “the culinary student population appears to be a group at risk for the existence or development of eating pathology and diagnosable EDs” (p. 49). Hodges et al. (1999) did note the complexity of interpreting the data:

There is a clear finding, however, of increased prevalence of lifetime EDs in the student group beginning before entry into culinary school. Examining the mean age of onset of the ED compared to the mean age of starting school, which is 17 in this case can shed some light on which came first: the ED or entry into culinary school. In our study, the onset of the ED occurred first. (p. 50)

Culinary Arts differ from nutrition in that it focuses on food and not what the body does with food. It differs from other high risk majors in that it does not focus on body image, but rather enjoyment of food. It would appear that other populations with a higher incidence of eating disorders are not just focused on bodily appearance but can include those that focus on consumption of food. Often culinary art schools are not part of a university, but instead part of a specialized program. The finding of Hodges et al. adds to the literature in identifying at-risk subgroups according to self selection, although they may not be part of most college campuses.

The literature acknowledges the possibility that college majors with an emphasis on the body would show a higher incidence of eating disorders (Peterson et al., 1993). Joseph et al. (1982) confirmed that the “individuals at risk for developing anorexia nervosa will gravitate toward areas of culture where there is increased focus on body image but not on physical exercise” (p. 53). White (1992) referred to professions that focus on appearance and weight noting that “it might be argued that certain women who are preoccupied with weight and shape and already have eating disorders choose these professions and life-styles, but no data are available to support this” (p. 358). She emphasizes “sociocultural factors that must not be overlooked are the professions and occupations that put a female at risk” (p. 358). There is a lack in the research in this area,

but clearly several researchers have alluded to eating disorders as it relates to college major and choice of profession.

Freshmen

Winters (2005) reported that freshmen were the highest risk group at the college level. This study analyzed results of the same population that Winters analyzed. Since freshman women in this sample were identified as being high risk and represented the first self selection at the college level, it was decided that looking at freshman Eating Attitudes Test-40 (EAT-40) scores and the initial demographic questionnaire would produce the most revealing results to channel resources to the highest risk groups.

Statement of Problem

Eating disorders are extremely damaging, and coupled with a high mortality rate cause alarm. Prevention efforts are costly, and narrowing those efforts maximize benefits. Some research has identified the freshman year as the highest risk period for college age women. It is unclear whether subpopulations of freshman women may be at particularly high risk and can be identified according to their college major.

Statement of Purpose

The purpose of this study is to explore the eating disorder risk of a sample of freshman women according to their initial declared major. We want to look at the highest risk group to see if they enter college self-selecting to specific environments. This will guide prevention efforts to appropriate funds to groups in with high risk.

Methods

Participants

Freshmen are particularly at-risk based on the Winters' (2005) findings. During the Fall of 2001, the EAT-40 and a demographic questionnaire (Appendices A and B) were sent to 1,800 randomly selected female freshman students at Brigham Young University. Of those, 658 surveys were returned. Another 1,800 female freshman students were randomly selected in the Fall of 2002 and sent the EAT-40 and demographic questionnaire. Of this group, 696 surveys were returned. In the Fall of 2003, another set of 1,800 freshmen, female students were randomly selected and sent the same measures. The last sample yielded a return of 643 surveys. The identity of the students was protected by assignment of an identification number to analyze their data. They were offered no incentives for completion of the surveys. The total sample size was 1,997 female students. Due to missing data, 73 women were excluded leaving 1,924 women as the sample size used in this sample. Two were missing data on the variable of major and 71 were missing data on the EAT-40. The 2003 sample was sent the questionnaires via email, and the EAT-40 was posted after another measure that assessed body image. It is suspected that respondents assumed they were finished with the survey after they had responded to the body image measure.

Brigham Young University (BYU) is a large, religious, conservative university consisting mostly of members of the Church of Jesus Christ of Latter-day Saints. The culture of the campus has elements of service and Christian values. "A BYU education should be (1) spiritually strengthening, (2) intellectually enlarging, (3) character building,

and (4) lifelong learning and service” (BYU, 2006, ¶ 3). This describes the traditional values that depict the culture at Brigham Young University.

Instruments

The demographic information collected included age, race, residence, home state, living conditions (whether they lived at home or not), athletic interest level, sports, dance, years in dance, and major.

Demographics Questionnaire

The college majors were categorized into 20 groups. College majors with similar subject matter were collapsed into groups. The 20 general groups were Art, Biology/Agriculture, Business, Communications, Dance, Dietetic, Don't Know/Unknown, Education, Engineering/Technology, English, History, Language, Math/Science, Marriage Family & Human Development, Music, Nursing, Physical Education, Psychology, Social Science, and Theater. A further description is listed in Table 1.

EAT-40

The Eating Attitudes Test -40 (EAT-40) was used in this study and has been shown to identify disordered eating in populations. According to Mintz and O'Halloran (2000) “the EAT measures more than a loosely defined notion of abnormal eating; the EAT seems to measure the likelihood of having a DSM-IV defined eating disorder. Hence, our results indicate that the EAT-40 can be used in nonclinical samples as a general screening measure for eating disorders” (p. 499). The EAT-40 is “the most widely used standardized measure of the symptoms and concerns characteristic of eating

Table 1

Demographic Questionnaire Groupings of Majors

Major Category	Similar Majors Included
Art	Art, Graphics, Illustration, Animation, Photography, Visual Arts, Interior Design
Biology/ Agriculture	Animal Science, Pre-Vet, Vet Tech, Agronomy, Zoology, Botany, Microbiology, Biology, Horticulture, Landscape, Range Sciences, Molecular Biology, Pre-med, Medical Teaching, Dental, Neuroscience
Business	Business, Business Management, Business Marketing, Finance, Accounting, Information Systems, International Business
Communication	Communications, Print Journalism, Broadcast Journalism, Public Relations, Marketing
Dance	Dance
Dietetic	Dietetics, Nutrition, Food Science
DK/Undeclared	Don't Know, Open
Education	Elementary Education, Childhood Education, Secondary Education, Home Economics, Teaching, Speech, Speech Language Pathology, Speech & Audiology
Engineering/ Technology	Technology, Technology Education, Industrial Design, Chemical Engineering, Mechanical Engineering, Civil Engineering, Electrical Engineering, Computer Engineering, Construction Management, Facilities Management
English	English, English Teaching, Comparative Literature
History	History, History Teaching, Humanities, Family History, American Studies, Philosophy
Language	Any Language Major (Spanish, French, etc.) Linguistics
Math/Science	Math, Math Education, Statistics, Actuarial Science, Chemistry Biochemistry, Lab Science, Geology, Computer Science, Physics, Biophysics, Astronomy

Table 1 (continued).

Major Category	Similar Majors Included
Marriage, Family, & Human Development (MFHD)	Marriage Family & Human Development, Home & Family Life
Music	Music, Vocal Performance, Any Instrument Performance, Music Dance Theater
Psychology	Psychology
Social Science	Geography, Sociology, Anthropology, Economics, Political Science, Social Science, Archeology, International Politics, Social Work, International Relations, Travel/Tourism
Theater	Theater, Media Arts, Film

disorders” (Garfinkel & Newman, 2001). Garner and Garfinkel (1982) report a validity coefficient of .87. In their sample they found an internal reliability coefficient of .79 for the anorexia participants and a .94 for the whole sample. Based on these findings the EAT-40 has become a well-respected way to screen for eating disorders, especially anorexia nervosa. Garfinkel and Newman (2001) report test-retest reliability as being .84 on the EAT-40. Respondents are asked to answer 40 questions dealing with how they view food or eating. They rate responses on a Likert scale consisting of the responses always, very often, often, sometimes, rarely, never. On each question only the three most severe responses have a point value. The extreme responses receive 3 points; the second and third extreme responses are awarded 2 and 1 points respectively. The EAT-40 also has some prediction of bulimic behavior (Garner, Olmstead, Bohr, & Garfinkel, 1982). With a self report measure researchers hope that those selected will respond and they “rely on the assumption that subjects will accurately describe their symptoms” (Garner & Garfinkel, 1982, p. 277). Both factors influence the data that researchers obtain.

The Eating Attitudes Test 40 (EAT-40) is a measure that helps identify people at-risk for eating disorders. It was developed by Garner and Garfinkel (1979) who report that the “EAT score was significantly correlated with criterion group membership ($r=0.87$, $P<0.001$), suggesting a high level of concurrent validity” (p.273). The test has questions that deal with attitudes and feelings toward eating behavior. The respondent answers each question by choosing one of six values (Always, Usually, Often, Sometimes, Rarely, Never), each of these values is assigned a point value with the maximum score of 120 (Garner & Garfinkel, 1979). This is supported by Mintz & O’Halloran (2000) found, “results of our study, which indicated that when using the EAT to differentially diagnose

individuals with and without DSM-IV-defined eating disorder...the EAT yield impressive accuracy rates (i.e., 91% for the EAT-40)” (p. 499). The cut-off score for the EAT-40 is 30 out of a possible 120 (Mintz & O’Halloran, 2000). The cut-off score indicates that those with a score of 30 or great have eating attitudes similar to those with a clinical diagnosis of anorexia nervosa (Garner & Garfinkel, 1982, p. 276) The EAT-40 appears to be a good predictor of disordered eating.

In large populations it is not feasible to measure whether each individual meets clinical criteria for a mental disorder. It is easier to assess those who seek treatment, but for the general population researchers generally administer a screening instrument. The EAT-40 served as the screening tool used to identify eating disorder risk. The statistics calculated in this study were based on student’s freshman EAT-40 scores and the freshman choice of major to see if there was a correlation between eating disorder risk and what is attractive as a field of study. High risk subpopulations were identified by comparing major groups’ risk rates to the average risk rate overall. This revealed whether or not women with a high likelihood of having an eating disorder were drawn to similar career fields.

Data Analysis

Across the 20 majors the EAT-40 scores were analyzed by the percentage of the group in the clinical range, the means, and the medians. The number of each subsample in the population that scored above 30 on the EAT-40 were considered to be in the clinical range, this was then divided by the number of participants in that particular sample. The mean score on the EAT-40 was calculated using all the scores from each sample. The median of each subsample was calculated using the EAT-40 score of all

participants in that college majors. The groups were then identified as being high risk if they were in the top five on more than one statistic and at-risk if they appeared above the clinical percent, mean or median of the total sample.

Results

The overall sample included 1,997 college freshman women age 18-24. The final total sample size that was used for this study was 1,924, because 73 were excluded due to missing data. The sample was then analyzed according to subgroups based on clusters of college majors and the number of women in each major reported in Table 2. Identifying subgroups can be calculated several ways. This study looks at the percentage of participants in the clinical range by subgroup; those with clinical populations higher than what was reported for the total sample were designated as having heightened risk. In addition this study reports the means and medians of each subpopulation; these statistics were compared with the mean and median of the total sample to see what college majors were above those values for the total population.

Percentage of Subjects in Clinical Range by Subpopulation

Based on the final sample size of 1,924, the percentage of women in the clinical range was 12.5%. This represents 240 women. The lowest clinical percent in a subgroup was 4.8 which contrasts with the highest subgroup with a 22.7 clinical percent. All majors with clinical populations above the sample average of 12.5% included Physical Education, Dance, Communications, English, History, Psychology, Business, and the Social Sciences.

Physical Education majors (n=88) had the highest percentage with 22.7% of their population falling in the clinically significant range. This is almost one fourth of the subgroup, as it represents a 10.2% increase above the total clinical population. According to this, people choosing Physical Education as their major have the highest risk, almost double that of the whole sample.

Table 2

Results of the Study

	<i>Major</i>	<i>n</i>	<i>EAT-40 Mean</i>	<i>SD</i>	<i>5% Trimmed Mean</i>	<i>EAT-40 Median</i>	<i>Range</i>	<i>% in Clinical Range</i>
1	Art	65	14.2615	13.77869	12.4872	10	2-90	12.3
2	Biology	122	13.8689	12.84102	12.1421	9	2-66	11.5
3	Business	102	15.8922	13.79188	14.3606	12	0-73	13.7
4	Communications	74	17.4865	14.28980	16.0450	13	3-78	16.2
5	Dance	22	18.3182	13.01789	18.0580	15.5	3-48	18.2
6	Dietetic	34	18.1765	11.80003	17.4085	15.5	2-49	11.8
7	Undeclared	384	14.3255	12.05062	12.9375	10	1-64	11.2
8	Education	198	14.1364	11.21803	12.8923	10	1-66	11.1
9	Engineering/ Technology	42	13.6905	13.16405	11.6164	10	1-66	4.8
10	English	101	15.8119	14.86655	13.8350	10	1-72	15.8
11	History	71	15.1268	14.37352	13.4734	10	1-63	15.5
12	Language	46	14.2174	12.83210	12.1618	10	4-68	6.5
13	Math/Science	88	13.4091	13.01603	11.6995	10	1-80	9.1
14	MFHD	37	14.8378	12.73341	13.2462	11	3-59	10.8
15	Music	80	14.1125	10.77855	12.8750	11	1-57	10.8
16	Nursing	127	15.5276	15.94327	13.2883	10	1-86	11.8
17	Physical Education	88	18.3295	18.20996	16.2399	10	2-105	22.7
18	Psychology	84	15.2143	11.77916	14.2460	11.5	1-50	14.3
19	Social Science	134	16.2687	13.30564	15.0489	11.5	0-57	13.4
20	Theater	25	15.1600	9.32595	14.4778	13	4-40	8.0
	Total	1924	15.0910	13.23713	13.92697	10	0-105	12.5

The Dance major subgroup had the second highest percent in the clinical range. In this group 18.2 % were in the clinical range. Dance majors had a sample size of 22. This amounts to approximately 4 people as compared with 20 people in the Physical Education sample meeting the clinical criteria.

Communication majors (16.2 %) English majors (15.8%), and History majors (15.5%) occupied the third, fourth and fifth slots respectively, as shown in Table 3. The *n* of each sample varies slightly with Communication majors accounting for 74 women in the total sample, English comprised of 101 women, and History including 71 women. As mentioned earlier a few other subgroups were above the mean of 12.5%; however, these top five groups seem to illustrate those most at-risk according to this variable.

Mean on the EAT-40 by Subgroup

At-risk populations can also be identified by the mean on the EAT. The analysis by the mean takes into account group averages, but there is a risk that outliers may skew

Table 3
Risk Rate Based on High Percentage of Persons with Clinical Scores Within Subgroups

Rank	Major	% in Clinical Range
1	Physical Education	22.7
2	Dance	18.2
3	Communications	16.2
4	English	15.8
5	History	15.5

data to appear more clinical. By looking at all individual values on the EAT in each group outliers can be identified. The 5% trimmed also reduces the effect of outliers and their impact on this variable as a way to identify risk.

This may present some problems, because it includes the scores on the EAT by each member of that group as a collective number. The overall mean for the total sample on the EAT was 15.0910 and was used to identify those groups with means above this value. To be considered clinical, the score on the EAT 40 has to be above 30, lower scores are considered to represent healthier eating attitudes. The subgroups with EAT means above 15.0910 included Physical Education, Dance, Dietetic, Communications, Social Science, Business, English, Nursing, Psychology and Theater.

The Physical Education sample had a mean of 18.3295. According to the variable of mean EAT score this would indicate the P.E. sample is at the highest risk. Physical Education majors had a range of 2-105 on the EAT. This is a fairly wide range, but a closer look at the data reveals that one individual had a score of 105 with the next highest score being 66. This score would influence this mean, the range, and the number in the sample.

The second highest mean was the Dance major group with an 18.3182 average and is consistent with the analysis based on percent of the clinical group. The scores in this group ranged from 3 to 48 on the EAT. This is a smaller range and did not include obvious outliers.

The third highest was Dietetics with a mean EAT score of 18.1765. The range of scores for this group was 2 to 49 on the EAT. This group did not appear at-risk in the analysis in the first analysis of clinical percent of the group. It is surprising, because

Dietetic majors would be expected to have lower scores on the EAT, because this is the study of healthy eating. It is assumed that women studying dietetics would have healthier attitudes about eating than other groups.

Communication majors surfaced with a mean of 17.4865 and Social Science with a 16.2687 as illustrated in Table 4. The Communications sample had a high percentage and high mean. The range of their scores was 3 to 78. This seems like a wide spread, but further analysis reveals an outlier of 78 which is 25 points above the next value. The Social Science majors had a high mean, but their percentage was slightly lower. The range of their scores was 0 to 57 on the EAT.

5% Trimmed Mean on the EAT-40 by Subgroup

When the 5% trimmed mean is used, thus reducing the impact of outliers, it changes the order of which group is most at-risk. The total sample 5% trimmed mean is 13.92697 as noted in Table 5. According to the 5% trimmed mean, Dance majors are most at-risk (18.0580). Next, Dietetic majors (17.4085) appear and Physical Education

Table 4
Risk Rate Based on Mean

Rank	Major	Mean
1	Physical Education	18.3295
2	Dance	18.3182
3	Dietetic	18.1765
4	Communications	17.4865
5	Social Science	16.2687

majors (16.2399) are third. Communications (16.0450) and Social Science (15.0489) hold the fourth and fifth positions. Other groups that were above the 5% trimmed mean included Business (14.3606), Theater (14.4778) and Psychology (14.2460). The same subgroups were identified with slight variations as to which subgroup was most at-risk.

Table 5
Risk Rate Based on 5% Trimmed Mean

Rank	Major	Mean
1	Dance	18.0580
2	Dietetic	17.4085
3	Physical Education	16.2399
4	Communications	16.0450
5	Social Science	15.0489

Median of Subgroup

The median on the EAT of the total sample is 11.2. Dance, Dietetic, Communication, Business, Psychology, and Social Science are all above the total sample average. All the other subgroups had a median of 9-11.

Dance and Dietetics have the same median for their samples of 15.5 on the EAT as shown in Table 6. Communications and Theater have slightly lower medians both with a median of 13. Communications majors have a high median even though this group had a significant outlier. Business majors have a median of 12. This is the first variable in which they appeared in the top five. Just lower than Business majors, the groups of Psychology and Social Science have the same median score of 11.5. This variable

provides another method to identify risk, because the median shows the midpoint of the sample. This differs from the mean because it simplifies the data, giving less weight to individual scores.

The median for the Physical Education majors, is 10, which is not a high median although they have a high mean. It would appear that the outlier of 105 has a big impact on this sample in terms of mean, but that the median is consistent with most of the other samples. Most of the subgroups had a median of 10.

Table 6
Risk Rate Based on Median

Rank	Major	Median
1/2	Dance/Dietetics	15.5
3/4	Communications/Theater	13
5	Business	12

Summary of Percent, Mean, Median

If we look at all the approaches, several groups register on all statistics as being high risk or in the top five groups as seen in Table 3. The Dance and Communications groups appear at the top of each analysis. While Physical Education appears the most at risk, according to the percent of the sample and mean, it had a low median. Dietetics students are at-risk on two out of the three statistics. Some appear only on one analysis and may indicate less risk. These groups include Business, English, History, and Theater. The groups with the most data supporting heightened risk are Dance, Communications,

Physical Education and Dietetics. Dance and Communications subgroups are the only groups that appear on all three statistics in the top five slots. However Business, English, History and Theater are at increased risk when compared with the overall sample.

Discussion

What does this all mean? Several groups within the college environment have heightened risk and merit further investigation. The literature review revealed studies that dealt with comparisons between specific populations (Crockett & Littrell, 1985; Joseph et al., 1982; Reinstein et al., 1992; Peterson et al., 1996). The intent of this study was to look at all majors and identify subgroups on the college campus. This opened up the analysis and allowed for assessment of risk in all subgroups. Three statistics were used to measure risk producing slightly different results. Several groups contained outliers that were significantly higher than most of the sample, so viewing the data from the 5% trimmed mean was advantageous. Eliminating outliers softened the results. A discussion of the characteristics illuminated in the literature section will add hypotheses to the results.

High Risk

This study was initiated as part of a pragmatic approach to provide the best allocation of resources in the prevention of eating disorders. First, we want to look at the groups having the most risk. Physical Education, Dance, Dietetics and Communications all have heightened risk. These majors were consistently high in at least two categories on the statistics examined; percent, mean, and median. It would be logical then to allocate resources for informational and prevention efforts in these college majors based on these results.

Other studies have looked at Physical Education, Dance and Dietetics for risk. A study done by Joseph et al. (1982) does not support the findings for Physical Education but did support Dance as a high risk group. They reported Dance with a mean of 21.5,

Drama with a mean of 20.95, English with a mean of 18.56 and Physical Education with a mean of 15; the only significant value was the mean for the Physical Education group (Joseph et al. 1982, p. 55). This compares with our findings of Dance with a mean of 18.3182, Theater with a mean of 15.1600, English with a mean of 15.8119, and Physical Education with a mean of 18.3295. The differences in this comparison could be due to sample size variations or changes in culture of the ideal body and knowledge about eating disorders. In this study there were notable sample size differences in Physical Education and Theater. Our results agree with the findings for Dance and Dietetics but not with those of Physical Education. The sample size of the Physical Education major may have contributed to the deviation from Joseph et al. Or as mentioned earlier, changing cultural values may be contributing to this difference.

Dance

In the literature, dancers have received a great deal of attention and have been found to have significant populations of people with eating disorders (Connor-Greene, 1994, Joseph et al., 1982). Dancing as a profession may be a slightly different population than those who study dance, but similar enough to make comparisons. Consistent with other reports it is not surprising that the Dance majors on the college campus also have a heightened risk. It is noteworthy that Dance majors were in the top three on every statistic substantiating the highest risk in the groups contained in this study.

Dietetics

Dietetic majors have also been studied to see if this population is more at risk. Crockett and Littrell (1985) found that this group had more negative eating behaviors, but also more positive eating behaviors (1985). The results of this study add credence to the

finding that Dietetics majors have a higher risk of engaging in unhealthy eating disorders. According to the study by Reinstein et al. (1992) it would appear that the mean of the group would be lower if indeed the group had more healthy eating habits. In addition, it would be expected that there would be a bi-modal distribution of scores. This was not the case; the data show a slightly right skewed distribution. The range of values on the EAT was 2-49, which is a relatively small range. This would indicate that those registering as clinically significant are closer to the cut-off score than other majors with wider ranges. For this group the mean is high and the standard deviation is fairly low when compared to other standard deviations of the sample. This means that the range is smaller.

The field of Dietetics does not have a focus on performance, but inherently a focus on the body and more specifically eating habits and the body. Perhaps students are self selecting into this major, because eating consumes their thoughts. Thinking about food all the time is a characteristic of people with eating disorders as (APA, 2000; Schwitzer et al., 1998). This major would match the cognitive process of the person to the curriculum assignments of the major. Freshman Dietetic majors already struggling with eating may think that they could use the knowledge to help them in college or to gain more information to help them engage in unhealthy eating practices. The data that reveal Dietetic majors have high risk and supports the idea that students come to college attracted to an area that they may use to gain information about eating or apply the knowledge already acquired to engage in unhealthy eating habits.

The finding that Dietetic majors are more at risk is supported by Reinstein et al. (1992) which found that “students entering college with dietetics or nutrition as their chosen major are at a higher risk of having an eating disorder but no program currently

exists in the dietetics curriculum to address this problem” (p. 952). This requires action with this group. Crockett and Littrell (1985) note that having an eating disorder in this population can “harm these students physically, may affect their academic progress, and eventually may interfere with their establishing sound therapeutic relationships with future clients” (p.56). The results of Reinstein et al. (1992) indicate freshman dietetic students admit to thinking processes and behaviors that put them more at-risk than junior and senior dietetic students (p. 951). This supports the findings of Winters (2005) and the results of this study, that freshman students would be a target group for more intense prevention efforts.

There is an element of emphasis on the body that people studying nutrition would be held to a higher standard than those not studying nutrition. The underlying premise is that Dietetics majors would abide by nutrition guidelines and therefore be able to maintain a healthy body. Eating disorders can start as a way to obtain the perfect body, although that is often not the maintenance of the behavior. A healthy body and a healthy looking body can be confused. While eating disorders wreak havoc on the body, it sometimes takes a while for the destructive habits to be noticed by others. Some may go years before physical manifestations appear. Those who do not practice healthy eating habits in this group may go undetected. It is sometimes difficult to tell when someone is over concerned about their caloric intake and exercise or simply making changes to be healthier.

These studies indicate that this needs to be addressed early in the dietetics program. If a dietetics major has an eating disorder, Reinstein et al. (1992) also acknowledged that “students may need more counseling and education on eating

disorders, especially because many of these students will eventually be counseling others professionally” (p. 949). Dealing with an eating disorder while working with others with the same disease would be very challenging, addressing this freshman year would be the most advantageous.

Physical Education

Physical Education had the highest percentage of people within the clinical range. This group had the highest mean and warrants attention. Athletes have been targeted in the literature as being at-risk (Berry & Howe, 2004), and athletes are often Physical Education majors so this finding is consistent with our findings. The hypothesis for the change between our results and those results of Joseph et al. may be explained partly by the findings of Joseph et al. (1982), which indicated that “high performance expectations in the absence of thin body ideal have no influence on the development of high EAT scores and perhaps anorexia nervosa” (1982, p. 56). Joseph et al. (1982) also did not support the risk population of Physical Education and hypothesized that athletes care more about being strong than thin, but this variable may have changed with changes in cultural values. If the Physical Education major now prefers thinness as opposed to strength, this could be the explanation of why this group is at heightened risk.

The majors with high clinical percentages have similar elements. The literature review is comprised of several studies trying to tease apart the characteristics of a person with an eating disorder. The groups that were identified may be influenced by some of the characteristics outlined in the literature review. Some of these elements include performance, attention to detail, and focus on the body (Ashby et al., 1998; Peterson, et al., 1993). In the literature review researchers highlighted characteristics such as anxiety

about performance and over concern about mistakes (Ashby et al., 1998). These may be important variables when taking a closer look at Physical Education, Dance, and Communications which have elements of performance. While individual factors contribute to whether the person experiences anxiety about their performance or they worry too much about blemishes in their performance these areas have performance components allowing for the manifestation of anxiety or over concern. The focus on the body or the presentation is ingrained in these majors. The ideal body and the ability to move the body is central to Physical Education and Dance. It would seem that those variables may be influencing the self-selection to these groups and merit continued research.

Communications

Communications majors differ slightly from Dance and Physical Education that although there is an emphasis on the body, it is in presentation, but not in ability to move the body. The presentation of the body does have some repercussions in this field. The field of Communications includes print and broadcast journalism, public relations, and marketing. Appearance is obviously a part of broadcast journalism, public relations, and to some extent marketing. Writers and broadcast journalists may differ in risk, as writers do not necessarily have the same focus on their body as broadcast journalists have. It would be suspected that a higher clinical group would exist in broadcast journalist since there is an emphasis on the body and performance. A break down by area of specialty would be useful to determine if risk is related to focus on the body and may have some career follow-up implications.

Tasks that Communications majors face are also performance based and so those that meet the clinical criteria may have characteristics in regard to anxiety about performance and concern about their mistakes.

It would be assumed that Physical Education, Dance and Dietetic groups would be considered health promoting, so it is disturbing that these groups include many people attracted to those majors with the tendency to engage in unhealthy practices. Athletes, dancers, and nutrition majors have been targeted by researchers as at-risk. There is the potential that learning to be healthy comes at an increased risk of associating with those who are unhealthy. This study provides support for those groups being at-risk, even though they should be health promoting.

The appearance of Dance majors as at-risk groups may have implications for dance groups and other performing arts. It would be interesting to look at that variable in this college setting or other universities. Those who are currently performing in competitions may differ from those who are studying with the goal to teach.

At-Risk

Some samples registered on one or two of the statistics as being at-risk, but not high risk. These samples include Business, Social Science, English, History, Psychology, and Nursing and may be other areas for further exploration. Business and Social Sciences came up in two statistics. Neither major has elements that would raise awareness initially.

However Social Science and English have been studied by other researchers; they were being compared with dietetics majors. Comparing English majors to Dietetics majors in another study indicated English majors have lower risk rates than dietetics majors (Joseph et al., 1985). This supports our results, but our results also indicate that

English majors have an above average risk rate. Again this may not have been the best comparison, because in our study Social Science and English are groups with high risk rates for eating disorders. The at-risk status for Social Science and English may merit further investigation in studies that used these groups for control groups.

Unexpectedly, English and History majors registered as subgroups at-risk. They do not have an element where there is performance at least in regards to the body. One explanation is that they may experience over concern about mistakes (Ashby et al., 1998). Both are very detail oriented disciplines. Perhaps for English majors who need to be critical for editing and writing this may have some implications for the maladaptive perfectionism earlier in the literature review (E. Rawlings, personal communication, April, 14, 2006).

Crockett and Littrell (1985) compared Social Science majors to Dietetics majors and found that Social Science majors had less positive eating habits than people in Dietetics. According to our results, these groups may not have been the best groups for comparison in other studies, because they were at-risk themselves. Our analysis shows Social Science majors are at-risk for eating disorders. Since this study did not use the same questionnaires it is difficult to make a comparison with the present study, but would indicate that on the variable of disordered eating this group did not vary significantly. There is a natural assumption that because Dietetic majors study the diet and the body, they would engage in more positive eating habits. The diet and emphasis on the body is not the focus of Social Science, so this group would not be expected to be at-risk for eating disorders.

Limiting Characteristics of the Sample

Brigham Young University is a unique campus in many ways. Differing cultural values may impact eating disorder risk by buffering or increasing the risk. Brigham Young University is a conservative, religious university with a code of conduct encompassing these values. As part of admission and continued enrollment students agree to adhere to a dress code and refrain from non medical substance use. These cultural values may alter the risk rates and constrict the data with an inability to generalize to other campuses. Comparison of both conservative religious colleges and secular colleges would provide insight into the impact of cultural variables.

The dress code requires modest clothing and designates, “Clothing is inappropriate when it is sleeveless, strapless, backless, or revealing; has slits above the knee; or is form fitting” (BYU, 2005, ¶9). This would reduce emphasis on the body and may impact the risk of eating disorders. Campuses without a dress code may differ in risk rates.

Substance use could be influencing eating disorders in several ways. Nicotine is an appetite suppressant and bulimia has some association with binge drinking. The Honor Code (Code of Conduct), that students commit to living, includes refraining from all alcoholic beverages and non medical drug use (BYU, 2005, ¶ 3). This may have some implications as generally experimentation with substances is part of the college experience and may influence the prevalence rates in the subgroups as well as the whole sample.

Another limitation of the study is that although the literature points to Culinary Arts and Fashion Merchandising, this campus did not have those majors available. This study could not substantiate the risk rates for either group because of lack of information.

Conclusion

This study looked at all college majors of university freshman women over three years and found higher risk rates in a several majors. The focus of the analysis of this particular study was to identify possible subgroups to enhance prevention strategies. This study was not meant to provide a profile of people with eating disorders, but rather heighten awareness about where at-risk group may exist. According to this analysis it is consistent that Physical Education, Dance, and Dietetics are at high risk. It is recommended that prevention efforts be targeted to these groups. However there is utility in addressing this issue across the college campus because all majors showed some portion of the population in the clinical range. Winters' (2005) conclusion would indicate that freshman prevention efforts would be a good use of monetary and staff resources. This analysis would include increase efforts among those freshmen that self select into fields of study of Physical Education, Dance, Dietetics and Communication.

At-risk subgroups with health promotion aspects need to be aware of the tendency for people struggling with disordered eating to congregate and address the needs of these women. The purpose of this study was to identify groups so that they could address prevention within to their curriculum. This may be occurring at some level, but increased efforts are recommended.

Future Research

Future studies may want to connect characteristic traits with subgroups on the college campus. An item analysis of the EAT and responses of each participant may yield some perceptions that are entrenched in that specific environment. Looking at another measure that assesses possible clinical risk could be used to compare to this population.

The Body Shape Questionnaire is also used to identify at-risk groups that might produce different results.

Longitudinal subgroup risk is an area to focus for further research. As mentioned, Winters (2005) noted that eating disorder risk decreases over time, so it would be predicted that the subgroups would decrease overtime. Some groups may remain at higher risk throughout the college experience. It would be interesting to see if the subgroups changed in risk rates. For example, when a student enters with an eating disorder they may choose Dietetics as their major, but as they become healthier may explore other subjects to study. They may gain the knowledge to move away from unhealthy behavior while staying in that major. This would change the risk rates for the group.

The large number of students in the Don't Know/Undeclared category was a large part of the population. Further researcher might focus on this group, especially when analyzing character traits such as autonomy.

This research points to follow-up in career fields of these majors. While dancers have received quite a bit of attention studying dietitians, those working in the Physical Education and Communication field would add to the literature. Dancers constitute specific population and are easily recognizable, whereas other professionals may be more difficult to track.

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Appendix A. EAT 40

EATING ATTITUDES TEST

Please check a response for each of the following statements and fill out **both sides**:

		Always	Usually	Often	Sometimes	Rarely	Never
1.	Like eating with other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Prepare foods for others but do not eat what I cook.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Become anxious prior to eating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Am terrified about being overweight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Avoid eating when I am hungry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Find myself preoccupied with food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Have gone on eating binges where I feel that I may not be able to stop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Cut my food into small pieces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Aware of the calorie content of foods I eat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Particularly avoid foods with a high carbohydrate content (e.g. bread, potatoes, rice, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Feel bloated after meals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Feel that others would prefer if I ate more.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Vomit after I have eaten.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Feel extremely guilty after eating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Am preoccupied with a desire to be thinner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	Exercise strenuously to burn off calories.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	Weigh myself several times a day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	Like my clothes to fit tightly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	Enjoy eating meat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	Wake up early in the morning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Eat the same foods day after day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	Think about burning up calories when I exercise.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TURN OVER

Appendix B. Demographic Questionnaire

DEMOGRAPHIC INFORMATION

1. Are you a current BYU student? Yes No

2. If you checked "No" for #1, are you (check all that apply):
 - Attending another college Planning to return to BYU
 - Serving a Mission On an Internship Already Graduated
 - Other _____

3. What is your age? _____

4. Do you live... On-campus (dormitory) Off-campus At home

5. What is your current marital status?: Single Married
 - Engaged Other _____

4. What is your current college GPA? _____

5. Do you currently participate in intercollegiate or *extramural* athletics?
 - Yes No

6. If yes to question #5, in which sport(s) do you participate?
 - Basketball Soccer Softball Tennis Swimming Cheer
 - Volleyball Cross country Track & field Golf Gymnastics
 - Rugby Other _____

7. Do you currently participate on a dance team? Yes No

8. Are you currently working? Yes No

9. If yes to #8, are you working...(check all that apply):
 - Full Time Part Time On Campus Off Campus

10. What is your anticipated major? _____ Undecided

11. How would you rate your social life at BYU thus far? (Please circle one)

Very Poor 1.....2.....3.....4.....5 **Very Good**

12. Any Comments? (Optional)
