Influence of Maternal Eating attitudes, Behaviors, and Fat Talk on Adolescent, Non-Elite, Competitive-Level Gymnasts

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INFLUENCE OF MATERNAL EATING ATTITUDES, BEHAVIORS, AND FAT TALK ON ADOLESCENT, NON-ELITE, COMPETITIVE-LEVEL GYMNASTS

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Northern Illinois University, 2020
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Adverse eating attitudes and eating behaviors describe thoughts and actions related to food and body image that increase risk for development for an eating disorder. The term “fat talk” is defined as “cultural meanings of talk about weight” and has been used to assess preoccupation with the cultural stigma of weight. Understanding risk factors for the development of adverse thoughts and actions in adolescence is especially important, as disordered cognitions and behaviors often appear in early adolescence. Maternal modeling, children modeling their actions or attitudes based on their mothers, plays a role in the level of risk. Similarly, gymnastics, an aesthetic sport, increases the risk for adverse eating attitudes and behaviors, but studies assessing the role of fat talk are limited. The objective of this non-experimental, cross-sectional survey study was to identify the association between maternal adverse eating attitudes, adverse eating behaviors, and fat talk on adolescent, non-elite, competitive-level gymnasts.
Surveys were administered by the researcher over a 5-month period, and risk for adverse eating attitudes, adverse eating behaviors, and fat talk was assessed by collection of self-reported data through these surveys.

A total of 51 mother-daughter dyads participated in this study. Of those 51 dyads, 42 completed the survey in its entirety, with an adolescent average age of 13.0 years ± 1.938 years. Findings were significant for adverse eating attitudes of mothers predicting adverse eating attitudes in their adolescent gymnast daughters, $r = 0.334, p < 0.05$. However, no significant relationship was found between the risk for eating behaviors in adolescent gymnasts and their mothers: Cox and Snell $r^2 = 0.019$, Nagelkerke $r^2 = 0.036$, $p = 0.999$. There was no statistically significant relationship between mothers’ and daughters’ use of fat talk, $r = 0.127$, $p = 0.425$. A statistically significant positive linear relationship was found between adolescent gymnasts’ use of fat talk and their own adverse eating attitudes, $r = 0.335$, $p < 0.05$. Similarly, a statistically significant positive linear relationship was found between adolescent gymnasts’ use of fat talk and their own adverse eating behaviors: Cox and Snell $r^2 = 0.227$, Nagelkerke $r^2 = 0.438$, $p = 0.007$. In addition to the hypotheses, there was a statistically significant positive linear relationship between gymnasts’ use of fat talk and the number of hours spent in the gym per week, $r = 0.423$, $p = 0.005$.

These findings support the maternal modeling of eating attitudes but not the maternal modeling of eating behaviors or use of fat talk reported in other studies. The positive relationship between adolescent gymnasts’ use of fat talk and increased risk for adverse eating attitudes and adverse eating behaviors are of note and warrant further investigation. Research would benefit from understanding the influence of additional family members’ adverse eating attitudes, adverse eating behaviors, and fat talk on adolescent gymnasts. Additionally, understanding more about
the positive relationship between time spent in the gym and use of fat talk in adolescent gymnasts would be useful in decreasing the risk of eating disorder development in adolescent gymnasts.
INFLUENCE OF MATERNAL EATING ATTITUDES, BEHAVIORS, AND FAT TALK ON ADOLESCENT, NON-ELITE, COMPETITIVE-LEVEL GYMNASTS

BY

MADISYN ROZNER
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A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE MASTER OF SCIENCE

SCHOOL OF HEALTH STUDIES

Thesis Director:
Sheila Barrett
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CHAPTER ONE

INTRODUCTION

Based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria and data collected through the National Comorbidity Replication between 2001 and 2003, the lifetime prevalence of the diagnoses of anorexia nervosa, bulimia nervosa, and binge eating disorder are estimated to be 0.9%, 1.5%, and 3.5% among women and 0.3% 0.5%, and 2.0% among men respectively.\textsuperscript{1,2} However, disordered eating behaviors are not limited to adults. An NHANES study of adolescent girls, 12 to 15 years old, revealed that 52.2% had tried to lose weight. Of those who had tried to lose weight, 81.4% and 51.1% had cut back on eating and exercised to lose weight respectively.\textsuperscript{3} The Youth Risk Behavior Surveillance System surveyed 13,917 adolescents and found that 45.8% of girls and 31.1% of boys had engaged in dieting, 50.2% of girls and 38.1% of boys had engaged in unhealthy weight control behaviors, and 6.8% of girls and 3.9% of boys had engaged in extreme weight control behaviors.\textsuperscript{4}

Eating disorders have a peak incidence between 15 and 19 years old.\textsuperscript{5} However, disordered cognitions and behaviors often appear in early adolescence. According to Rohde, Stice, and Marti, eating disorder risk factors escalate most drastically during early adolescence.\textsuperscript{6} During this period, typically between 11 and 14 years old, the brain and cognitive functions mature. Relationships change with peers and family during early adolescence as well. Eating
disorder risk factors have been identified as early as five or six years old, but due to these changes in early adolescence, eating disorder risk factors become more pronounced.\textsuperscript{6,7}

In addition to cognitive changes that occur during adolescence, female adolescents were shown to be almost three times more likely to have abnormal eating attitudes if their mothers revealed abnormal eating attitudes through scoring high on the Eating Attitudes Test (EAT-26).\textsuperscript{8} Parents play a large role in modeling as well as communicating attitudes and behaviors relating to body weight, body shape, and food intake. Parents can also influence their child through verbal messages about the child’s body shape and eating behaviors.\textsuperscript{9} Children internalize behaviors observed from maternal mannerisms. The demonstration of behaviors, such as dieting, affect future behaviors of adolescents. It is likely that the child will adopt behaviors and perspectives of their mothers as they grow up.\textsuperscript{10} In a study done to assess potential risk factors in the development of eating disorders in female adolescent, aesthetic, elite athletes, parental influence was a strong predictor of disordered eating.\textsuperscript{11} Additionally, it was also found that adolescent, aesthetic, elite athletes had a greater risk for developing an eating disorder when compared to aesthetic, non-elite athletes.\textsuperscript{11}

Adolescents in aesthetic sports, such as gymnastics, dance, and wrestling, are at a higher risk of developing an eating disorder.\textsuperscript{12} There are several factors that put athletes in aesthetic sports at a higher risk. Female aesthetic athletes have been shown to have greater drive for thinness, dieting behavior, and concerns for weight and shape than the general population.\textsuperscript{13} Shape concern is often related to either being judged in competition or improving sport performance.\textsuperscript{13} A study investigating sports-related risk factors for disordered eating in aesthetic sports found that the desire to be leaner in athletes was due to their belief that weight regulation
will enhance their sport performance. This belief was shown to be predictive of disordered eating behaviors.\textsuperscript{14} Dieting is often suggested as a solution to poor performance in aesthetic sports.\textsuperscript{15} 

Desire to be leaner can arise from more factors than only sport performance. The desire to attain the thin ideal is associated with the desire for acceptance within societal norms.\textsuperscript{16} “Fat talk” is believed to be one way adolescents communicate about social norms related to appearance. The term “fat talk” was defined as “cultural meanings of talk about weight” by Nitcher and Vuckovic in 1994.\textsuperscript{16} They used anthropological research methods, such as ethnographic interviews, to study adolescents’ preoccupation with weight and how it manifests in conversation. They studied adolescents from the Teen Lifestyle Project, which was a longitudinal project that focused on body image, dieting, and smoking. Through interviews and focus groups they found that adolescent girls exclaiming, “I’m so fat,” was more than a statement about weight. It was a statement that acted as a call for support from others, for affirmation that they were not fat and did fit in with the culture, or as an apology for behavior that did not fit the cultural norms.\textsuperscript{16} Since the concept of fat talk was defined, research has begun on the effect of fat talk on eating disorder risk as well as in mother and daughter relationships. For example, a study was done to assess the relationship between eating attitudes and behaviors of mother-daughter pairs, and when mothers and daughters both had high levels of fat talk, daughters’ at-risk eating attitudes increased.\textsuperscript{17} Understanding the relationship between fat talk and eating pathology is still in its infancy.
Background and Significance

There have been studies done that work to increase knowledge of the relationship between parental eating attitudes and adolescents’ eating attitudes. The consensus in the general population is that the family, especially mothers, plays a role in eating attitudes of adolescents.8,10,18

A seven-year longitudinal study of 228 girls utilized the Eating Attitudes Test (EAT-26), the Children’s Eating Attitudes Test (ChEAT), and the Eating Disorder Inventory (EDI-2). It was determined that fathers’ EAT-26 scores were predictive of 9-year-olds’ ChEAT scores seven years later. It was also determined that mothers’ perfectionism scores were predictive of 13-year-olds’ ChEAT scores seven years later. Protective factors were shown to be low body mass index (BMI), healthy eating attitudes, and high self-esteem among the adolescents.19 Both parents were associated with risk factors; however, the relationship changed as the daughter’s age changed. A limitation of the study was the lack of emphasis on self-esteem as a variable. Self-esteem was found to be a protective factor in girls who had high levels of perfectionism.19 Although this finding is valuable, information regarding associated self-esteem of girls and their parents would have increased the value of the conclusion. In this study, adolescents and their parents were randomly selected from schools, but the current research study used a purposive sample of gymnasts in order to study the role that the variable of an aesthetic sport would play in the relationship between eating attitudes and behaviors of mothers and their daughters.

Using the EAT-26, eating attitudes and behaviors were assessed in adolescent girls and their parents in a study conducted in Barcelona, Spain.8 Of the 969 randomly selected girls ages 12 through 18, ten percent showed abnormal eating attitudes.8 Of the 969 mothers and 969
fathers, eight percent and three percent, respectively, showed abnormal eating attitudes. It was found that the relationship between the daughters’ and parents’ eating attitudes was most significant between mothers and daughters. The fathers’ eating attitudes were not as predictive of their daughters’ eating attitudes. This outcome suggests that the influence of maternal modeling affects adolescent eating behavior. The importance of maternal modeling was demonstrated through this study; however, this study was a cross-sectional study, indicating that neither prediction nor causation can be concluded. Additionally, the development of an eating disorder is multifactorial and could not be determined by a single factor, even in a randomized controlled trial. The current study differs because adolescents within an aesthetic sport were studied, which provided a common risk factor within the population.

Studies conducted on adolescent, aesthetic athletes have shown a variety of risk factors, such as internalization of the thin ideal, body image dissatisfaction, low self-esteem, and maternal influence. Studies have also incorporated the concept of fat talk into their research.

Through a cross-sectional study, Francisco, Narciso, Alarcao, and Alarcão compared adolescent, aesthetic, elite athletes and adolescent, aesthetic, non-elite athletes and found that female, elite athletes demonstrated a greater risk for developing an eating disorder. Adolescents were given the McKnight Risk Factor Survey-IV (MRFS-IV), Contour Drawing Rating Scale, and Eating Disorder Examination--Questionnaire in order to assess the potential risk factors in the development of eating disorders in female adolescents. Social pressure to internalize the thin ideal was shown to be the strongest predictor of disordered eating in non-elite athletes, and body image dissatisfaction was the strongest predictor of disordered eating in elite athletes. Fat talk may be used to express the social pressure to internalize the thin ideal. While this provides
evidence of an association between social pressure to internalize the thin ideal and disordered eating in non-elite athletes, more information is needed to understand whether social pressure is expressed through fat talk. The current study assessed whether this social pressure was expressed through the use of fat talk. Furthermore, parental influences, as self-reported by the adolescents, were shown to be predictors of low self-esteem and disordered eating in only elite athletes. A limitation of the study is that maternal influences were reported by the adolescents rather than the mothers. Adolescent reporting of maternal influences could result in under- or over-reporting based on the adolescents’ perception. Based on this limitation, the current study of adolescent, aesthetic, non-elite athletes measured maternal influence based on the EAT-26 and was reported by the mothers and adolescents.

Lombardo et al. surveyed pre-adolescents’ body dissatisfaction and evaluated the impact of both maternal influence and sport. Those in aesthetic sports had an increased desire to be thinner than those in non-aesthetic sports. Mothers were surveyed using the Disordered Eating Questionnaire (DEQ) and it was found that pre-adolescents in aesthetic sports had mothers who wanted them to be thinner. Most importantly, they found that maternal characteristics such as perfectionism and restricting food intake were predictive of pre-adolescent body dissatisfaction in both aesthetic and non-aesthetic sports. It is also important to note that mothers of pre-adolescents in aesthetic sports showed higher restricted eating in the DEQ than mothers of pre-adolescents in non-aesthetic sports. This demonstrates the importance of studying maternal relationships in aesthetic sport populations. One limitation of the study includes the use of pre-adolescents rather than adolescents. Previous research has demonstrated that risk factors become more prominent in adolescence. Additionally, the extent to which the thin ideal was internalized by the pre-adolescents was not assessed. A questionnaire to assess internalization of
the thin ideal in the pre-adolescents as well as the mothers would have been beneficial. The current study used the same survey for both the mothers and their daughters for the sake of consistency.

It is assumed that adolescent gymnasts are at higher risk for developing an eating disorder than adolescents in the general population due to their participation in aesthetic sports.\textsuperscript{12,24,25} In order to increase the effectiveness of prevention efforts for gymnasts, a greater understanding of the risk factors, such as maternal eating attitudes and behaviors and use of fat talk, is crucial. Maternal influence and use of fat talk was be assessed in the current research study because of their prevalence in the lives of the adolescent gymnasts.

The current study used a purposive sample of gymnasts in order to study the role that the variable of an aesthetic sport would play in the relationship between eating attitudes and behaviors of mothers and their daughters. Additionally, it assessed the use of fat talk in both mothers and daughters. This differs from previous studies either in study design, selection process, target population, assessment tools, or variables. These studies provided valuable information to determine the design of this study.

The target population became more specific as a result of previous findings. Adolescents rather than pre-adolescents were assessed because previous research has demonstrated that risk factors become more prominent in adolescence.\textsuperscript{5,19} Additionally, non-elite athletes are at higher risk than non-athletes and are influenced by more variables than elite athletes.\textsuperscript{26} This assisted in the decision to study the non-sport-related variable of mothers’ eating attitudes and behaviors in non-elite athletes.

Limitations of studies helped determine what variables to focus on. Previous studies demonstrated the need for more information on the maternal influence on eating attitudes and
behaviors, specifically within adolescent gymnasts.\textsuperscript{14} Similarly, there was a lack of information available on fat talk within this population.\textsuperscript{27}

The purpose of this research study is to increase understanding of the influence of mothers in eating attitudes and behaviors as well as use of fat talk in their daughters. The study also aims to increase understanding of the relationship between use of fat talk and eating attitudes and behaviors in this population.

Objectives

1. Determine if there is a relationship between eating attitudes of mothers and adolescent daughters in an aesthetic sport (gymnastics).
2. Determine if there is a relationship between eating behaviors of mothers and adolescent daughters in an aesthetic sport (gymnastics).
3. Determine if there is a relationship between mothers’ use of fat talk and adolescent daughters’ use of fat talk.
4. Determine if use of fat talk is correlated with high-risk eating attitudes in adolescent gymnasts.
5. Determine if use of fat talk is correlated with high-risk eating behaviors in adolescent gymnasts.
Research Questions

1. To what extent do maternal eating attitudes correlate with gymnast daughters’ eating attitudes?
2. To what extent do maternal eating behaviors correlate with gymnast daughters’ eating behaviors?
3. To what extent does maternal use of fat talk correlate with gymnast daughters’ use of fat talk?
4. To what extent is use of fat talk in girls in gymnastics correlated with high-risk eating attitudes?
5. To what extent is use of fat talk in girls in gymnastics correlated with high-risk eating behaviors?

Hypotheses

1. Mother and daughter EAT-26 (Part B) will show that eating attitudes of adolescents in an aesthetic sport (gymnastics) are positively correlated to the mother’s eating attitudes.
2. Mother and daughter EAT-26 (Part C) will show that eating behaviors of adolescents in an aesthetic sport (gymnastics) are positively correlated to the mother’s eating behaviors.
3. Mother and daughter FFTQ will show that use of fat talk in adolescents in an aesthetic sport (gymnastics) is positively correlated to the mother’s use of fat talk.
4. Gymnasts’ EAT-26 (Part B) and FFTQ will show that use of fat talk in adolescents in an aesthetic sport (gymnastics) is positively correlated with high-risk eating attitudes.
5. Gymnasts’ EAT-26 (Part C) and FFTQ will show that use of fat talk in adolescents in an aesthetic sport (gymnastics) is positively correlated with high-risk eating behaviors.
CHAPTER TWO

LITERATURE REVIEW

Aesthetic Athletes at Risk

Clinical eating disorders were found in 25% of female elite athletes in endurance sports, aesthetic sports, and weight-class sports but in only 9% of the general population when assessed in a large Norwegian study. Females involved in aesthetic sports, such as figure skating, dance, and gymnastics, are at a higher risk of developing disordered eating and eating disorders. The higher risk is related to factors such as weight concerns, body dissatisfaction, social pressure, and the presumed association between weight loss and sport performance.

Body dissatisfaction has been shown in girls as young as five and seven years old in aesthetic sports. A study was done with 197 non-Hispanic five-year-olds that measured 192 of the participants two years later at age seven to assess the relationship between aesthetic sports and weight concerns in young girls. When the study began, two thirds of mothers had a level of education higher than a high school diploma. Additionally, incomes below $35,000, between $35,000 and $50,000, and above $50,000 were reported in equal proportions of families. The girls were categorized into groups based on participation in an aesthetic sport, participation in a non-aesthetic sport, and lack of sport participation. They were divided into groups based on age
as well as sport participation. Weight concerns were assessed using a simplified version of the Weight Concerns Scale. The Weight Concerns Scale measures concern with weight related to body image. They found that both five- and seven-year-old girls in aesthetic sports reported higher weight concerns than those participating in non-aesthetic sports or those not participating in sports. Additionally, weight concerns were higher in seven-year-old girls in aesthetic sports who had also participated in aesthetic sports at five years old. The implications of these findings are that weight concerns are associated with aesthetic sport participation and concerns develop at a young age. The importance of these findings is due to the relationship between weight concerns and risk for disordered eating and eating disorders. A limitation of the study is that it did not hypothesize the means behind the relationship between weight concerns and aesthetic sports. The current study also analyzed the relationship between weight concerns and aesthetic sports but used adolescent athletes because it has been shown that risk factors become more prevalent during adolescence.

Harriger, Witherington, and Bryan conducted a cross-sectional study in order to examine risk and protective factors that may affect body image disturbance and eating pathology in adolescent gymnasts. Participants were comprised of 100 female non-collegiate, non-elite gymnasts between 10 and 15 years old. Of these gymnasts, 77.8% identified as Caucasian, 11.1% as Hispanic, 2% as Asian American, 2% as Native American, 1% as African American, and 6.1% as “other.” To measure eating attitudes and behaviors, the ChEAT was used for girls between 10 and 12 years old and the EAT-26 was used for girls between 13 and 15 years old. The Rosenberg Self-Esteem Scale (RSE) was used to measure self-esteem in the girls. Objectified Body Consciousness – Youth Scale (OBC-Youth) was used to measure body shame and body surveillance in pre-adolescent and adolescent youth. Finally, the Pubertal Development
Scale (PDS) was used to collect data on pubertal development of the girls. The results revealed that higher self-esteem was associated with lower ChEAT scores, lower levels of body shame, and lower levels of body surveillance.\textsuperscript{27} However, pubertal development was associated with increased body surveillance, body shame, and disordered eating. Interestingly, more time spent training was associated with lower levels of disordered eating and body shame. The authors hypothesized that this may be because increased time training may result in a body type that is synonymous with the thin ideal or because increased time training increases confidence. Self-esteem proved to be a protective factor regardless of pubertal development and time spent training.\textsuperscript{27} The study emphasized the increased risk for eating disorders in adolescents as they go through puberty. It also emphasized the importance of uncovering risk factors in aesthetic athletes. It did not attempt to determine if there is an association between mothers and daughters. The current study added a maternal component in order to better understand how maternal influence impacts eating attitudes and behaviors as well as use of fat talk.

A relationship between weight concerns and aesthetic sports has been found in many studies, but there are variables behind the relationship that need further research.\textsuperscript{11} Internalization of the thin ideal, body dissatisfaction, pressure from being judged during competition, and the assumption that weight loss is associated with sport performance are all associated with risk of the development of an eating disorder for adolescents in aesthetic sports.\textsuperscript{13,14} A one-year longitudinal study was done to investigate the sport-related risk factors of disordered eating in aesthetic sports.\textsuperscript{14} Participants were between the ages of 11 and 18 years old and were selected from elite sports schools and Olympic training centers with an emphasis on adolescents in aesthetic sports. Of the 65 participants, 38 were female and 27 were male. The mean age of females was 14.0 ± 2.4 years and the mean age of males was 14.1 ± 2.1 years. Participants
completed the Eating Attitudes Test (EAT-26) to screen for disordered eating attitudes and behaviors as well as the Emotional Element of Exercise subscale of the Obligatory Exercise Questionnaire (OEQ-EE) to assess emotional distress attached to missing exercise sessions. Other items assessed included sports-related body dissatisfaction, desire to be leaner to improve sport performance, and social pressure from the sports environment. The study concluded that the sports-related social pressure significantly increased in girls, but not in boys. The desire to be leaner to improve sport performance was found to be predictive of disordered eating attitudes through a cross-lagged partial correlation analysis. Emotional distress resulting from missed exercise and social pressure from the sports environment were not found to be significant in predicting disordered eating or eating disorders; however, the authors noted that due to the short time period of only one year and the small sample size of only 65 adolescents, these factors should not be completely disregarded. The researchers tested which variables predicted disordered eating attitudes over a one-year period, but they did not test for a relationship between the sport-related variables. For example, they did not test whether or not emotional distress resulting from missed exercise was associated with desire to be leaner to improve sport performance. This analysis would have increased comprehension of the significant relationships found. This study also did not analyze how sport-related variables were affected by non-sport-related variables. In the current study, disordered eating attitudes and behaviors were assessed, using the EAT-26 in order to analyze if a relationship with a non-sport-related variable, mothers’ eating attitudes, exists.

Neves et al. did incorporate non-sport-related variables in their study. Analyzing the association between body dissatisfaction and media influence, perfectionism, mood, and risk behavior for eating disorders was the goal of the study. They also compared the variables
between elite gymnasts, non-elite gymnasts, and non-athletes. Participants were between ages 10 and 18 and consisted of 40 elite athletes, 245 non-elite athletes, and 128 non-athletes. Participants were recruited from gymnastics gyms and public schools in Brazil. Both males and females were included in the data; however, females made up the majority of the groups. Participants were given the Body Shape Questionnaire (BSQ) to test for body dissatisfaction as well as the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3) to test for media influence as well as sport and exercise influence on body image. The EAT-26 was used to assess at-risk eating attitudes and behaviors. Additional scales were used to assess perfectionism and mood. The researchers found that body dissatisfaction was influenced by at-risk eating attitudes and behaviors in all three groups. However, the amount that body dissatisfaction was influenced by at-risk eating attitudes and behaviors increased with the level of competition. Perfectionism scores were lower in non-athletes, putting gymnasts at a higher risk for disordered eating attitudes and behaviors. These body dissatisfaction results indicate that aesthetic athletes, elite or non-elite, are at a higher risk for eating disorders than non-athletes. Additionally, eating attitudes and behaviors were the only factors to influence body dissatisfaction in elite athletes, whereas in non-elite and non-athletes other variables were part of what influenced body dissatisfaction. Other variables that influenced and predicted body dissatisfaction included body fat percentage, mood, and media. Variables like the media can be influenced by home life and parental attitudes in an adolescent population, which is something Neves et al. did not include in their variables. Parents can mediate messages from the media, for example, by modeling a reaction to messages. The way characters’ appearances are discussed is a response to messaging. This discussion could be described as a form of fat talk. For this reason, the current study included data on the use of fat talk. Given that non-elite athletes are still
At higher risk than non-athletes, but are influenced by more variables than elite athletes, the current study tested the non-sport-related variable of mothers’ eating attitudes and behaviors in non-elite athletes.

A cross-sectional study done in Portugal to determine the potential risk as well as levels of disordered eating in adolescent athletes in aesthetic sports grouped athletes by elite and non-elite level. Of the 725 participants, 453 were female and 272 were male. Participants lived in various parts of Portugal, with the majority living in either Lisbon metropolitan area (46.9%) or Lisbon city (43.6%). When grouped into elite and non-elite, 245 adolescents were considered elite athletes and 480 were considered non-elite athletes. The elite athletes were comprised of internationally competitive gymnasts and professional dance students. The non-elite athletes were made up of gymnasts who competed at a lower level as well as recreational dancers.

Participants were evaluated on the potential risk factors for the development of eating disorders using the McKnight Risk Factor Survey-IV (MRFS-IV). The Portuguese version of the Eating Disorder Examination--Questionnaire (EDE-Q) was used to assess disordered eating. They found that female elite athletes reported a greater risk of developing eating disorders than female non-elite athletes. Contradicting the results found by Krentz and Warschburger, results showed that social pressure was the strongest variable in predicting disordered eating in non-elite athletes and that body image dissatisfaction was the strongest variable in predicting disordered eating in elite athletes. Furthermore, parental influence was seen as a predictor of disordered eating in elite athletes, whereas low self-esteem was a predictor of disordered eating in non-elite athletes.

Parental influence was measured through questions in the MRFS-IV. Francisco, Narciso, Alarcao, and Alarcão observed parental influence through the eyes of the adolescents using the MRFS-IV questionnaire. There may be parental influence that adolescents either were unaware
of or did not report. Therefore, when using non-elite adolescent athletes in the current study, parents filled out the EAT-26 on their own in order to assess whether eating attitudes and behaviors correlated to their daughters.

Eating Attitudes and Behaviors of Mothers and Adolescent Daughters

Studies that have assessed the relationship between eating disorder risk factors in mothers and daughters have focused on topics ranging from maternal eating attitudes to maternal body dissatisfaction. The Eating Attitudes Test (EAT-26) is commonly used to assess eating attitudes and behaviors. The Children’s Eating Attitudes Test (ChEAT) is a version of the EAT-26 that has been adapted for children; however, some studies continue to use the EAT-26 in adolescents. The EAT-26 as well as other instruments are used to assess if there is a relationship between the eating attitudes and behaviors of mothers and their daughters. The current study assessed eating attitudes and behaviors in adolescents between 11 and 21 years old as well as their mothers. The EAT-26 was the only assessment of eating attitudes and behaviors.

Yanez et al. used the EAT-26 for both parents and their adolescent daughters in order to assess the association of eating attitudes in adolescent girls with eating attitudes of their parents. The participating 969 adolescents were between 12 and 18 years old. The mean age of the adolescent girls was 13.9 ± 1.2 years. All participants were recruited from schools in the primarily rural county of Osona, Spain. Body mass index (BMI) of the adolescent girls was recorded. Based on the EAT-26 results, ten percent of the adolescents, three percent of fathers, and eight percent of mothers showed abnormal eating attitudes. This was indicated by an EAT-26 score above 20. Univariate analyses showed that age, BMI, menarcheal status, paternal
obesity, and mothers’ high EAT-26 scores were significantly associated with the adolescent girls’ EAT-26 scores. A multivariate analysis was done with age, BMI, and the mothers’ EAT-26 scores. It revealed that older girls, girls with obesity, and girls whose mothers had abnormal eating attitudes were significantly more likely to have high EAT-26 scores. The association between mothers’ and daughters’ EAT-26 scores indicates that maternal modeling plays a role in daughters’ eating attitudes and behaviors during adolescence. The use of BMI is a limitation of the study. Rather than using the BMI equation typically used for adults (weight in kilograms divided by height in meters squared) for those between 2 and 20 years old, the CDC recommends assessing BMI-for-age. While the additional information on age may increase the value of the information, according to Johns Hopkins Medicine, the beginning of puberty varies from 8 to 13 in girls and from 9.5 to 14 in boys. Therefore, there is room for significant error in BMI in adolescents. The current study had a similar design, but did not use BMI as a variable. As Yanez et al. did, it used a survey for both the parents and adolescents. The difference is that the current study was done in a high-risk population of aesthetic adolescent athletes, and it measured the participants’ use of fat talk.

Canals, Sancho, and Arija investigated the relationship between parents’ cognitive and behavioral dimensions and the risk of eating disorders in non-clinical adolescents using a two-year longitudinal study design. Participants were recruited from schools in the city and suburbs of Tarragona, Catalonia, Spain. Tarragona has been identified as a city with above-average socioeconomic status. By the second data collection two years later, the sample was down to 200 adolescents between 9 and 13 years old. Of the 200 adolescents, 93 were male and 107 were female. They were given the ChEAT to assess eating attitudes and behaviors. They were also interviewed with a semi-structured protocol using the Diagnostic Interview for Children and
Adolescents--Revised (DICA-R). Parents and adolescents were given the Eating Disorder Inventory (EDI-2) to identify specific cognitive and behavioral dimensions of eating disorders. There was a significant relationship between adolescents whose ChEAT scores during the second measurement, two years later, indicated that they were at risk for an eating disorder and mothers who had significantly higher scores in body dissatisfaction, drive for thinness, ineffectiveness, and interoceptive awareness. The mothers’ EDI-2 subscale scores at the initial measurement and adolescents’ EDI-2 subscale scores two years later revealed that body dissatisfaction significantly correlated between a mother and her daughter. Through the same instruments, a significant relationship was found between ascetism of fathers and their daughters. The BMI was not a predictor for a high ChEAT score. The current study used the EAT-26 for the adolescents rather than the ChEAT. For the sake of consistency, the EAT-26 was used with the mothers as well.

Westerberg-Jacobson, Edlund, and Ghaderi conducted a seven-year longitudinal study that began in Uppsala County, Sweden, with 228 girls who were either 9 or 13 years old. One purpose of the research was to examine the predictive value of eating attitudes, a wish to be thinner, dieting, perfectionism, self-esteem, and BMI on the development of disturbed eating attitudes seven years later. Another purpose was to examine the girls’ parents’ eating attitudes and perfectionism in relation to the development of disturbed eating attitudes in the girls seven years later. The last purpose was to examine whether or not normal body weight, healthy eating attitudes, and low perfectionism together with high self-esteem might operate as a protective factor. The final sample only included girls with at least one parent participating; therefore, there were 228 girls and 410 parents in the study. In Year 1, approximately half of the girls (n=107) were 9 years old and the other girls (n=121) were 13 years old. Instruments used for the
adolescents included a Swedish version of the ChEAT, an extended version of the Demographic and Dieting Questionnaire (DEMO), BMI, the Eating Disorder Inventory for Children (EDI-C), and “I Think I Am.” The DEMO was used to solicit the children’s ideas about family and self-dieting patterns, as well as to identify peer pressure to be thin. The “I Think I Am” instrument is a Swedish instrument to assess self-esteem. The questionnaires used for the parents included the EAT-26 and EDI-2. For the girls who were 9 years old in Year 1, there was no significant correlation between the ChEAT scores at Year 1 and Year 8. However, fathers’ EAT scores significantly correlated to their ChEAT scores at Year 8. For the girls who were 13 years old in Year 1, there was a significant correlation between the ChEAT scores at Year 1 and Year 8. Neither parents’ EAT scores correlated to the ChEAT scores at Year 8 for the 13-year-old group. Risk factors that most predicted disturbed eating for the 9-year-old girls included a “wish to be thinner” and fathers’ EAT scores. Risk factors that most predicted disturbed eating for the 13-year-old girls included a “wish to be thinner” and mothers’ rating on perfectionism. Additionally, they found that low BMI, low ChEAT scores, and a low to medium degree of perfectionism acted as protective factors. High self-esteem seemed to act as a buffering factor when girls had a high level of perfectionism. The current study used aesthetic athletes as the sample because they are a high-risk population.

While the three studies prior studied eating attitudes between parents and adolescents in the general population, Lombardo et al. studied personal characteristics in mothers and the predictability of body dissatisfaction in their pre-adolescent daughters in aesthetic sports. The purpose of the study was to evaluate the singular and conjoint role of the type of sport and maternal influence in young female children. The study consisted of 212 mother and daughter pairs. The pre-adolescents were between 6 and 12 years old and were practicing their sport at
least twice a week. The mean age of all participants was 9.22 ± 1.75 years. However, the mean age of children participating in aesthetic sports (8.49 ± 1.72 years) was lower than the mean age of children participating in non-aesthetic sports (10.10 ± 1.34 years). Body dissatisfaction was measured in the pre-adolescents by having them choose a silhouette that they thought looked like them and a silhouette that they would ideally look like. Comparing their ideal to their actual body image is how body dissatisfaction was calculated. Mothers were asked to provide three reasons why they had decided to suggest the type of sport their child was in. The mothers were also given the Disordered Eating Questionnaire (DEQ), which was used to evaluate disordered eating behaviors, and the Contour Drawing Rating Scale (CDRS), which was used to indicate a wish to be thinner. The body dissatisfaction measure given the children was also given to the mothers. They were to pick which silhouette looked like their child and which silhouette the child would ideally look like.20 Lastly, Frost’s Multidimensional Perfectionism Scale (MPS-35) was used to assess mothers’ levels of perfectionism.

Analyses showed that mothers of children in aesthetic sports were younger and thinner than mothers of children in non-aesthetic sports. Similarly, children in aesthetic sports were significantly younger and had lower BMI than children in non-aesthetic sports. Additionally, children in aesthetic sports reported greater desire to be thinner than those in non-aesthetic sports. Mothers of children in aesthetic sports showed significantly higher levels of restricted eating and desire to be thinner than mothers of children in non-aesthetic sports.20 These results indicate that mothers’ eating attitudes and behaviors affect pre-adolescents’ body dissatisfaction. A multiple regression analysis revealed that a mother’s desire to have a thinner child and a mother’s habit of restricted eating were the most predictive variables for body dissatisfaction in children in aesthetic sports ($r^2 = 0.395$).20 The study found that mothers of children in aesthetic
sports may want their child to be thinner. The study does not address why that desire is predictive of body dissatisfaction of the children and did not indicate whether mothers are verbally expressing these desires to their children. The current study evaluated the use of fat talk in mothers who have daughters in an aesthetic sport in order to determine how weight is talked about within that relationship. Another limitation is the use of pre-adolescents rather than adolescents. Considering that body dissatisfaction is a risk factor for the development of an eating disorder, the authors could have included the eating attitudes and behaviors of the children as well to evaluate whether disordered attitudes and behaviors develop in the same time frame as body dissatisfaction.18,26

Hahn-Smith and Smith examined the role of maternal identification in the development of girls’ body image, eating attitudes, and self-esteem.34 The hypothesis behind examining maternal identification is that if a young girl identifies or associates her body shape with her mother’s body shape, the way the young girl sees herself will mirror how her mother sees herself.35 The girls who participated in the study were recruited from public schools in New Mexico and were between 8 and 13 years old. There were 92 mother and daughter pairs in the study. The majority of participants identified as Hispanic (48%) and Anglo (41%). The remainder identified as Hispanic/Anglo (7%), Native American (3%), and African American (1%). The daughters were given the Body Esteem Scale (BES) to assess how they value their appearance and how they believe others evaluate them. They were also given the ChEAT to assess eating attitudes and behaviors. Child figure drawings (CFD) were done in order to assess body dissatisfaction in the girls. Similar to the silhouette drawing described in Lombardo et al.,20 the girls were to determine which drawing they most identified with and which drawing they would most like to identify with. The Piers-Harris Children's Self-Concept Scale was used to
examine self-esteem and the Self-Descriptive Q-Sort was used to examine maternal identification and self-concept. The mothers were given BSQ to test for body dissatisfaction as well as the EAT-26 to assess eating attitudes and behaviors. Mothers were asked to complete figure drawings (FD) to identify which drawing they identified with and which drawing they would ideally identify with. They also filled out CFD about their daughters. Lastly, the mothers were given Rosenberg Self-Esteem Scale (RSE) to assess self-esteem. The researchers found that mothers of daughters with high body esteem indicated that the ideal body for their daughter was larger than it was currently. Mothers who had higher levels of body dissatisfaction were more likely to have daughters with high levels of body dissatisfaction. Through examining self-esteem in both mothers and daughters, they concluded that mothers who had higher self-esteem scores tended to have daughters with higher self-esteem scores. Girls with higher maternal identification had lower ChEAT scores, which reveals that girls of this age strive to be like their mothers. This increases the importance of identifying the relationship between eating attitudes and behaviors of mothers and daughters. With the similar habits demonstrated between mother and daughter in this study, the current study determined whether these similarities continued with the use of fat talk.

These studies have all demonstrated maternal influence on daughters, whether in eating attitudes or body dissatisfaction. The current study used instruments such as the EAT-26, which has been used in studies of the general population, but did so with a sample of aesthetic athletes because of the high risk associated with aesthetic sports. The risk associated with aesthetic sports is not solely related to the sport itself. As learned through Lombardo et al., there are similarities in the personal characteristics of mothers who put their daughters in aesthetic sports.
Use of Fat Talk

Fat talk can act as a call for support from others, for affirmation that one is not fat and does fit in with the culture, or as an apology for behavior that does not fit the cultural norms. The use of fat talk serves many purposes, but it also has many effects. The use of fat talk can be harmful to body image satisfaction as well as eating attitudes and behaviors.

A correlational study was done with 321 female college students between the ages of 18 and 25 years old. The participants were recruited from a co-ed liberal arts college in the northeastern United States, which has a student body that is primarily (74%) Caucasian. The purpose of the study was to determine if verbally participating in fat talk conversations had a different effect on body image than only listening to others participate in fat talk. The Fat Talk Questionnaire (FTQ) was used to assess fat talk. A question was added to determine how often participants listened to close friends use fat talk. Measures assessed included drive for thinness, body dissatisfaction, and dietary restraint. Drive for thinness and body dissatisfaction scores were derived from the Eating Disorders Inventory (EDI). The Dietary Intent Scale was used to measure dietary restraint. Results showed that verbally participating in fat talk was more strongly associated with a drive for thinness, body dissatisfaction, and dietary restriction than listening to friends participate in fat talk. The current study differs from that study because it focused on mother-daughter dyads rather than friends. Understanding that listening to fat talk may not be as harmful to a female’s body image as participating in fat talk is valuable. When adolescents listen to fat talk regarding their own bodies, this relationship changes. According to Lydecker, Riley,
and Grilo, parents who used fat talk to discuss their child reported higher rates of binge eating, overeating, secretive eating, and obesity in their adolescents.\textsuperscript{22}

Lydecker, Riley and Grilo conducted a correlational and cross-sectional study to determine the associations between forms of parental fat talk and disordered eating behaviors in children.\textsuperscript{22} Additional variables measured were weight, child sex, and age. The study included 581 parents (387 mothers and 193 fathers) of pre-adolescents and adolescents. Parents identified as White (80.4%), Black (7.4%), Hispanic (4.3%), Asian (2.4%), and other (5.5%). Most relationships between parent and child were biological (86.7%). There were 278 pre-adolescents and 301 adolescents. The FTQ was given to parents to measure negative conversations regarding weight, also known as fat talk. This instrument was adapted to focus on parental use of fat talk specifically in front of their children. They defined self-fat talk as using fat talk to discuss themselves. Obesity-fat talk was defined as using fat talk to talk about others. Child-fat talk was defined as using fat talk to discuss their child. The Eating Disorder Examination--Questionnaire (EDE-Q) was given to measure eating disorder pathology over the four weeks prior to the study. Lastly, parents reported their child’s age, height, and weight. The researchers found that 76.0% of parents reported self-fat talk in front of children, 51.5% reported obesity-fat talk, and 43.6 percent reported child-fat talk. Fat talk did not differ between parents of pre-adolescents and adolescents, but fat talk was more common with sons than daughters. However, only child-fat talk was associated with the children’s eating and weight variables. The association was strongest for adolescent girls. Weight variables included binge eating, overeating, secretive eating, and overweight/obesity and were taken from the EDE-Q.\textsuperscript{10} The study provides evidence that parental fat talk occurs and is associated with disordered eating behaviors. It suggests that interventions may be necessary to educate parents on how they discuss weight and body image
around their children, but was limited by only collecting data from the parents’ perspective. Parents may undermine the way they speak in front of their children.

Arroyo and Andersen assessed the association between mothers’ and daughters’ appearance-related communication and body image outcomes. Appearance-related communication was broken down into fat talk and old talk. Fat talk was defined as disparaging comments about their own and others’ bodies, regarding weight and size. Old talk was defined as disparaging comments regarding someone’s age or the aging process and how it relates to physical concerns. The daughters were recruited from students in communication classes at a large university in the southeastern United States. Daughters’ ages ranged from 18 to 25 years old. The daughters identified as White/Caucasian (79.4%), Black/African American (8.5%), Asian (7.5%), Hispanic/Latina (3.5%), and other (2%). Mothers’ ages ranged from 36 to 60 years old. The mothers identified as White/Caucasian (80.9%), Black/African American (8%), Asian (15.7%), Hispanic/Latina (2.5%), and other (1%). There were 199 mother-daughter dyads. Fat talk was measured through the Fat Talk Scale and was done by measuring frequency of fat talk through nine vignettes with scenarios. Old talk was measured through the Old Talk Scale, which was developed based on the Fat Talk Scale. Therefore, it also consisted of nine vignettes with scenarios. In both instruments, participants rated on a Likert scale how likely they would be to react similarly to the scenarios. Body dissatisfaction, body surveillance, drive for thinness, and bulimic tendencies were also assessed. Actor-partner independence models were used. A significant relationship between mothers’ and daughters’ fat talk was found. This relationship insinuates that daughters may be modeling their mothers’ weight-related communication. This association was not found with old talk. Additionally, mothers’ fat talk was associated with higher levels of bulimic tendencies in their daughters. Mothers’ old talk was associated with
daughters’ body dissatisfaction. The significance of old talk may be associated with the process of learning the social and cultural beliefs of beauty. Furthermore, both mothers’ and daughters’ use of fat talk was related to their own body image concerns.23

Chow and Tan conducted a cross-sectional study in order to assess the relationship between eating attitudes and behaviors of mother-daughter pairs and the prevalence of fat talk.17 Additionally, the relationship of depressive symptoms and fat talk was investigated. Participants were recruited from a midwestern metropolitan area in the United States. Adolescent girls were between 11 and 18 years old. The average age of the mothers was about 44 years old. There were 100 mother-daughter pairs in the study. Mothers identified their daughters as Caucasian (48%), African American (30%), mixed race/other (15%), Asian (4%), Hispanic (2%), and Middle Eastern (1%). Most of the mothers (90%) reported at least some college education. Additionally, 79% reported a household income of $35,000 or above. The EAT-26 was used to measure eating attitudes and behaviors. The Family Fat Talk Questionnaire (FFTQ) was used to measure fat talk tendencies. It was modified to focus on mothers and daughters, rather than family members in general. Depressive symptoms were measured through the Brief Symptom Inventory. Data was analyzed by the actor-partner interdependence model. The partner effects of fat talk, meaning how the mothers’ use of fat talk affected the daughters’ eating attitudes and behaviors or vice versa, were not statistically significant. The researchers found that mothers’ and adolescent daughters’ participation in fat talk was related to their own eating attitudes and behaviors, meaning that increased participation in fat talk was associated with a higher EAT-26 score. Additionally, when mothers and daughters both participated in high levels of fat talk, daughters’ EAT-26 scores increased.17 This indicates that the reciprocation of fat talk by the mother has
more of an impact on eating attitudes and behaviors than only hearing fat talk or disclosing fat talk.

The authors hypothesize that reciprocation acts as an affirmation of the concerns.\textsuperscript{36–38} This effect was only seen in the adolescents’ eating attitudes and behaviors, which may be due to the risk factors associated with adolescence.\textsuperscript{5,6} Furthermore, adolescent girls’ fat talk engagement was associated with their own depressive symptoms. There was not an association with the daughters’ depressive symptoms and their mothers’ use of fat talk. The authors hypothesized that the lack of mothers’ participation in fat talk may be related to the daughters’ depressive symptoms because the daughters’ expression of fat talk may be prevalent in order to receive social support and understanding.\textsuperscript{39} Without the mothers reciprocating the fat talk, the daughters may feel more alone in their concerns.\textsuperscript{17} This study design was very similar to the current study and was used to help model the current study. The current study additionally assessed the relationship between mothers’ and daughters’ fat talk. The biggest difference in the current study is that it assessed adolescent, aesthetic athletes and their mothers because of the increased risk for behaviors associated with eating disorder risk.\textsuperscript{12,20,24,25}

Summary

Through the review of literature, the current study was molded. There is significant research to indicate a relationship between aesthetic athletes and risk for disordered eating and eating disorders. From as young as five years old, participation in an aesthetic sport increases risk for disordered eating and eating disorders via increased weight concerns when compared to five-year-old girls participating in a non-aesthetic sports.\textsuperscript{25} However, this study focused on
adolescent girls because studies have shown that risk factors increase as girls enter adolescence. Pubertal development has been associated with increased body surveillance, body shame, and disordered eating.²⁷ It is evident that participation in an aesthetic sport is related to the risk of the development of an eating disorder for adolescents through sport-related variables, such as sport-related social pressure and desire to be leaner to improve sport performance.¹¹,¹⁴ There has not been as much data to indicate which non-sport-related factors increase risk of development of disordered eating or an eating disorder in adolescent athletes. The studies that did discuss non-sport-related variables found that non-elite athletes were at a higher risk than non-athletes but were influenced by more variables than elite athletes. The variables discussed included perfectionism, body dissatisfaction, eating attitudes, and eating behaviors.²⁶ These results directed this study into the assessment of the non-sport-related variables in non-elite athletes.

These non-sport-related variables have been frequently assessed in the general population rather than aesthetic athletes. Furthermore, these variables have been assessed in parent-daughter dyads. Girls whose mothers had abnormal eating attitudes were significantly more likely to have high EAT-26 scores.⁸ Additionally, adolescent girls who had mothers with significantly higher scores in body dissatisfaction and drive for thinness were at risk for disordered eating or an eating disorder.¹⁸ While fathers were assessed in some of these studies, mothers had a greater impact while their daughter was an adolescent.¹⁹ Due to the increased risk of adolescence, studying the mother’s role was deemed more valuable. Moreover, mothers of children in aesthetic sports showed significantly higher levels of restricted eating and desire to be thinner than mothers of children in non-aesthetic sports.²⁰ This relationship increases the need to understand the modeling effect in mother-daughter dyads in an aesthetic sport.
The variable of fat talk was included in order to assess a potential vehicle for maternal modeling to take place as well as to assess the relationship between fat talk, eating attitudes, and eating behaviors. Parents who used fat talk to discuss their child reported higher rates of binge eating, overeating, secretive eating, and obesity in their adolescents. When the relationship between eating attitudes and behaviors and fat talk was assessed in mother-daughter dyads, data showed that when mothers and daughters both participated in high levels of fat talk, daughters’ EAT-26 scores increased. This indicates a relationship between fat talk and risk of developing disordered eating or an eating disorder in the general population, but with the data on the risk of adolescent athletic athletes, the strength of the relationship should be assessed in the high-risk population.

Some studies collected data about parental influence from the adolescent perspective. On the other hand, other studies collected data only from the parents’ perspective. Either perspective on its own creates limitations in reliability of the data; therefore, this study collected data from both the parent and adolescent perspectives.

Within the literature review, the most prominent questionnaires relating to eating pathology were the Eating Attitudes Test (EAT-26), Children’s Eating Attitudes Test (ChEAT), Eating Disorder Inventory (EDI-2), Eating Disorder Inventory for Children (EDI-C), McKnight Risk Factor Survey-IV (MRFS-IV), and Eating Disorder Examination--Questionnaire (EDE-Q). The focus of this study was on risk factors for development of disordered eating or an eating disorder. EDI-2 and EDE-Q both examine eating disorder tendencies rather than risk factors. While EDI-C and MRFS-IV examine risk factors, they are both greater than 90 questions long. Due to the setting of providing questionnaires during gymnastics practice time and fear of deterring participation, they were ruled out. ChEAT was considered for this study due to being
validated for a population 13 years old and below and assessing eating attitudes and behaviors; however, with an expected age range of 11-21 years old in the current study, a questionnaire that could accommodate the entire age range was preferable. While not in the original study, EAT-26 has been validated in the adolescent population in previous studies.\textsuperscript{18,19,27}
CHAPTER THREE

METHODS

Research Design

This study aimed to: 1) determine if there is a relationship between eating attitudes and behaviors of mothers and adolescent daughters in an aesthetic sport (gymnastics), 2) determine if there is a relationship between use of fat talk of mothers and adolescent daughters in an aesthetic sport (gymnastics), and 3) determine if use of fat talk is associated with high-risk eating attitudes and behaviors in adolescent gymnasts. A cross-sectional study with a purposive sample was done using adolescent, competitive-level, non-elite gymnasts and their mothers. Eligible daughters and mothers were surveyed in order to assess eating attitudes and behaviors as well as use of fat talk. Due to the use of humans in the study, IRB approval was sought from Northern Illinois University.

Study Population

The study population consisted of adolescent females who were actively participating in gymnastics and their mothers. Adolescence is defined as the phase of life between 11 and 21
years old. The girls were required to be between 11 and 21 years old and participating in gymnastics at a Junior Olympics Level 4 or higher. USA Gymnastics has defined levels from 1 to 10. As levels increase, competition and skills required become more difficult. The inclusion of specifically Level 4 and above was chosen due to participation in competition and likelihood of the gymnasts being within the age requirements. Inclusion criteria for the girls included active enrollment in a Level 4 or higher team and participation of their mothers or an adult female who acts as a mother figure whom they primarily live with. Step-mothers and adoptive mothers were included if the adolescent primarily lived with them. Exclusion criteria for the girls included the lack of participation from their mothers. Mothers and daughters who did not live together were excluded.

This study was feasible because I had an employer-employee relationship with the gym owner of the Palatine Park District Gymnastics Program. I only worked with the recreational programs and did not work with the Palatine Gymnastics Club, the competitive program. The connection with the Palatine Park District had a snowball effect and led to connections with other gymnastics programs. The Palatine Gymnastics Club, the American Academy of Gymnastics, Cary Gymnastics, and Royalty Gymnastics agreed to allow me to recruit in their facility (Appendix A). Additionally, permission to speak to the parent group at a Booster Club meeting was received from the Palatine Gymnastics Club (Appendix A).
Procedure

Recruitment and Consent

Participants were recruited from gymnastics clubs in Illinois (Appendix B). An email was sent to the owners of the gymnastics clubs to receive permission to utilize their gymnasts in the study (Appendix A). Additionally, permission was requested to speak to their parent clubs regarding the study. Upon IRB approval and permission from the gymnastics clubs, I went to the clubs to recruit study subjects (Appendix C). A consent/assent form was placed in an envelope and given to each adolescent who was under 18 years old (Appendix D). Consent for the mothers’ participation was given in an envelope to adolescents who were 18 years old or older. When providing the envelopes to the adolescents, I specifically told the adolescents to give the envelope to the adult female at home. This should have prevented adolescents from giving the envelope to a biological mother who does not live with them, for example. The mothers’ questionnaires were also in the envelope. The adolescents took the envelope home to their mother or adult female at home. The consent letter had a return date on it set for two weeks from the week it was brought home. Additionally, the consent letter had information about the incentive for the mothers to participate. The incentive to participate was to be entered in a raffle for a $50 Amazon gift card (Appendix E). If the mothers chose to participate, the form and questionnaires were returned in a self-addressed envelope to me. A parent had to give consent for their child who was under 18 years old and the child also gave their assent. If the gymnast was over 18 years old, the mother only received and filled out a consent letter for herself. The gymnasts who were over 18 years old consented for themselves prior to filling out the
questionnaires at the gym (Appendix D). After consent/assent and the mothers’ questionnaires had been returned to me, two weeks later, I went back to the gymnastics club to give the questionnaires to the adolescents to fill out at the gym during practice.

To be able to collect the data using existing scales, the authors of the questionnaires used in this study were contacted via email to request permission to use the questionnaires. For the Eating Attitudes Test, David Garner, Ph.D, was emailed (Appendix F) to request permission and he directed me to a website that allowed me to request permission to use the Eating Attitudes Test (Appendix F). Danielle MacDonald, PhD, C.Psych, was emailed regarding the Family Fat Talk Questionnaire (FFTQ). She confirmed that the FFTQ was public domain; therefore, I was free to use it as long as it was cited properly (Appendix G).

After receiving IRB approval, I scheduled recruitment and distribution of the letters with each gym separately. Envelopes were passed out to the gymnasts to take to their mothers. The consent and assent forms as well as the maternal questionnaires were in the envelopes. Envelopes with only a consent letter and the maternal questionnaires were handed to the gymnasts who were over 18. There was a second copy of the consent form in the envelope so the mothers could keep a copy for their records. The envelopes given to the parents were already addressed and had postage for them to send to me once they were completed. Once the envelopes were returned, I went to the gymnastics clubs to distribute the questionnaires to the adolescents. The gymnasts completed their questionnaires at the club, at the beginning of practice. Complete anonymity was not possible in order to identify mother-daughter dyads. Once the mothers’ questionnaires were received, they were coded with a personal identification number (PIN) and names were not used. The questionnaires that each gymnast took had a PIN in the upper corner that correlated to the same small number in the upper corner of the mother’s questionnaires.
One winner was chosen from each gym. Winners of the gift cards were randomly chosen by putting PINs into an online drawing system. Winning PINs were matched to the envelope that was sent back to the researcher. The return label on those envelopes was used as the mailing address to send the gift cards via the United States Postal Service. In the envelope with the gift card was a letter explaining that they had been randomly chosen and asking them to send an email to the researcher to confirm that the gift card was received. All four winning participants confirmed the receipt through email.

Based on the potential risk of possible emotional discomfort or increased anxiety due to the questionnaires used in the study, information and handouts from the National Eating Disorder Association (NEDA) were emailed to the gym owners to distribute to both families and coaching staff (Appendix H). This provided families with information on how to speak to a loved one about concern for an eating disorder and how to find help. Coaches were provided with information on identification and prevention of eating disorders from a coaching perspective.

**Data Collection and Description of Instruments**

The Eating Attitudes Test (EAT-26) measured eating attitudes through a 6-point Likert scale that ranges from 0 (Never) to 5 (Always) (Appendix F). The cut off score was 20 points. A score higher than 20 points indicated risk for disordered eating and development of an eating disorder. Rather than using a cutoff score of 20 points, various studies have treated the EAT-26 scores as a continuous score. EAT-26 scores can range from 0 to 78 points. Additionally, behaviors of the past six months were assessed using questions such as, “Exercised more than 60 minutes per day to lose or control your weight?” and “Ever made yourself sick (vomited) to
control your weight or shape?” A study comparing the EAT-26 scores in a group of females with clinical anorexia nervosa and a female comparison group of college students studying psychology was done in females between 16 and 27 years old. A Cronbach’s alpha of 0.90 indicated that the test achieved good internal reliability. Although the EAT-26 was not originally validated for adolescents under 16 years old, many studies utilized the EAT-26 for this age group and achieved good internal reliability. Chow and Tan studied adolescents 11 through 18 years old and utilized the EAT-26 to measure eating attitudes and behaviors. They found a Cronbach’s alpha of 0.75 for the adolescents. In that same study, the mothers were also given the EAT-26, which had a Cronbach’s alpha of 0.71 for the mothers. Yanez et al. measured eating attitudes and behaviors in a cross-sectional study with 969 adolescents between 12 and 18 years old and found valid data using the EAT-26. Neves et al. used the EAT-26 on an adolescent population between 10 and 18 years old. They reported an internal reliability of 0.83 for their sample using the questionnaire. Additionally, Krentz and Warschburger assessed eating attitudes and behaviors of adolescent, aesthetic athletes between the ages of 11 and 18 years old using the EAT-26. They reported a Cronbach’s alpha of 0.90, indicating that the assessment was reliable for this population.

The current study only used parts B and C of the EAT-26, which included both eating attitudes as well as behaviors (Appendix I). Part A, which included self-reported height and weight in order to compute BMI, was not included in the current study. The decision to not include BMI was based on several factors, including the possibility that reporting weight would make it less likely for this age group to want to participate in the study given known weight concerns in this population; the fact that the design of the study (self-report) makes it possible that self-reported weight and height, and thus BMI, would be prone to self-reporting error and
could be unreliable; and also that BMI calculated with height and weight without consideration of pubertal development may be a poor indication of whether an adolescent is actually at a healthy weight. Based on the CDC recommendation to use BMI-for-age for those who are between 2 and 20 years old in combination with the varying pubertal age from Johns Hopkins Medicine, neither weight nor BMI was of interest in the current study.\textsuperscript{32,33} Also of note, the language in the instructions was changed. Rather than telling the participant that she was being screened for an eating disorder, the instructions informed the participant that eating attitudes and behaviors would be measured. This decision was made to simplify the language and prevent deterring participants from completing the questionnaire.

The Family Fat Talk Questionnaire (FFTQ) measured fat talk within the family. The instrument consisted of 16 questions that included measurement of participation of fat talk in the presence of family and the measurement of hearing fat talk when in the presence of family. These subscales were also defined as the “self” and the “family” subscales. The questions were rated on a 5-point scale. Answers ranged from Never to Always. The questions were scored as follows: Never (1), Rarely (2), Sometimes (3), Often (4), and Always (5). The Cronbach’s alpha for these questions was reported to be 0.90.\textsuperscript{43} This questionnaire was originally validated for those between 17 and 35 years old; however, the questionnaire has been utilized with adolescents and had valid results.\textsuperscript{17} To fit the purpose of the current study, the version of the FFTQ modified to mothers and daughters, rather than family in general, was used. Scores ranged from 16 to 80 and were scored continuously.

Chow and Tan used a modified version of the FFTQ to measure fat talk in mothers and daughters specifically\textsuperscript{17} (Appendix J). Chong Man Chow provided permission to use the modified questionnaire via email (Appendix J). The researchers found this questionnaire had a
Cronbach’s alpha of 0.91 in adolescents, 11 through 18, and a Cronbach’s alpha of 0.85 in their mothers, indicating satisfactory internal reliability. The current study assessed use of fat talk; therefore, the current study used the modified FFTQ that was used by Chow and Tan\textsuperscript{17} (Appendix J). Instructions were not provided when permission was given from Chong Man Chow, so instructions were modified from the original FFTQ. Modifications included specification to mothers and daughters as well as providing the description of fat talk rather than using the term “fat talk.” This decision was made to simplify the language and prevent deterring participants from completing the questionnaire.

Chow and Tan collected data for both subscales but only analyzed the “self” subscale.\textsuperscript{17} In Lin and Soby, it was shown that verbally participating in fat talk was more strongly associated with a drive for thinness, body dissatisfaction, and dietary restriction than listening to friends participate in fat talk.\textsuperscript{21} Therefore, the final data analysis utilized the “self” subscale and the “family” subscale separately.

**Data Analysis**

A level of significance of $p < 0.05$ was applied to all hypotheses. Statistical Package for the Social Sciences (SPSS) Version 24 was used for all data analyses. The manufacturer of the program is IBM Corporation. Descriptive statistics such as mean, range, and standard deviation were used with demographic data such as age, gender (to confirm participants were female), and race as well as with competitive level of the gymnasts and hours spent in the gym per week. Additionally, descriptive data on the mother-daughter dyads, such as if they were living in the same home, were biologically related, had a step-relationship, or had an adoptive relationship,
was collected (Appendix K). Participants’ scores on the EAT-26 were given a score on a continuous scale. Continuous data from the EAT-26 (Part B) was analyzed using Pearson’s correlation coefficient (Table 1). Similarly, the FFTQ was scored continuously and Pearson’s correlation coefficient was used (Table 1). A linear regression was used to assess the relationship between the EAT-26 (Part B) of gymnasts and the EAT-26 (Part B) of their mothers, the relationship between the FFTQ of gymnasts and the FFTQ of their mothers, and the relationship between the FFTQ of gymnasts and the EAT-26 (Part B) of gymnasts (Table 1). A binary logistic regression was used to assess the relationship between EAT-26 (Part C) of gymnasts and EAT-26 (Part C) of their mothers as well as the relationship between the Self subscale of the gymnasts FFTQ and their EAT-26 (Part C) scores (Table 1).

**Data Safety and Monitoring**

For the purpose of matching data from mother-daughter dyads, data was not anonymous. In order to match mother-daughter dyads, I collected names, but names were not used. Participants were assigned a personal identification number (PIN) and there was no identifying information in the study. Questionnaires with data were stored in a locked desk drawer in my apartment. The only anticipated risk to the subjects was possible emotional discomfort or increased anxiety due to the questionnaires. Risk was minimized by informing the participants that if any question was emotionally distressing, they were free to remove themselves from the study.
Table 1. Statistics Used for Hypotheses

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Types of Variables</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Eating attitudes of adolescents in an aesthetic sport (gymnastics) are related to their mothers’ eating attitudes.</td>
<td>Exposure: Maternal EAT-26 score (part B)</td>
<td>Pearson’s correlation coefficient Linear Regression</td>
</tr>
<tr>
<td></td>
<td>Outcomes: Gymnasts’ EAT-26 score (part B)</td>
<td></td>
</tr>
<tr>
<td>2. Eating behaviors of adolescents in an aesthetic sport (gymnastics) are related to their mothers’ eating behaviors.</td>
<td>Exposure: Maternal EAT-26 score (part C)</td>
<td>Binary Logistic Regression</td>
</tr>
<tr>
<td></td>
<td>Outcomes: Gymnasts’ EAT-26 score (part C)</td>
<td></td>
</tr>
<tr>
<td>3. Fat talk of adolescents in an aesthetic sport (gymnastics) is related to their mothers’ fat talk.</td>
<td>Exposure: Maternal fat talk score</td>
<td>Pearson’s correlation coefficient Linear Regression</td>
</tr>
<tr>
<td></td>
<td>Outcomes: Gymnasts’ fat talk score</td>
<td></td>
</tr>
<tr>
<td>4. As fat talk in adolescents in an aesthetic sport (gymnastics) increases, high-risk eating attitudes increase.</td>
<td>Exposure: Gymnasts’ fat talk score</td>
<td>Binary Logistic Regression</td>
</tr>
<tr>
<td></td>
<td>Outcomes: Gymnasts’ EAT-26 score (part B)</td>
<td></td>
</tr>
<tr>
<td>5. As fat talk in adolescents in an aesthetic sport (gymnastics) increases, high-risk eating behaviors increase.</td>
<td>Exposure: Gymnasts’ fat talk score</td>
<td>Pearson’s correlation coefficient Linear Regression</td>
</tr>
<tr>
<td></td>
<td>Outcomes: Gymnasts’ EAT-26 score (part C)</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER FOUR

RESULTS

This chapter addresses the results and findings of this study regarding the relationship between eating attitudes, eating behaviors, and fat talk among adolescent, non-elite, competitive gymnasts and their mothers. All data were analyzed using the SPSS version 24.0 for Windows Statistical Software (SPSS Inc., Chicago, IL, USA). The demographics of the sample used in this study will be discussed first. Subsequently, the findings of influence of mothers in eating attitudes, eating behaviors, and use of fat talk in their daughters will be addressed. Lastly, the findings of the relationship between use of fat talk and eating attitudes and behaviors in the gymnasts will be discussed.

Participant Characteristics

A total of 42 mother-daughter dyads were included in the results of this study. One hundred and forty mothers were recruited and 51 responded, resulting in a 36.4% response rate. With 51 maternal responses, 51 gymnasts were eligible to participate. One hundred and two ($n = 102$) women and girls participated the study survey, with four main components – the EAT-26 (Part B), EAT-26 (Part C), the Family Fat Talk Questionnaire, and the demographics section
(Table 2). Although 102 participants started the survey, nine mother-daughter dyads were excluded due to incomplete responses or inability to collect data from both parts of the mother-daughter dyad for all or parts of the survey. Three mothers returned the incomplete surveys, indicating that data would not be collected from their daughters. Six gymnasts were absent on the day data was collected at their gym, indicating that their mothers’ data would be excluded. The 84 remaining participants were in mother-daughter dyads, meaning that 42 sets of data were collected. Therefore, 42 dyads completed all surveys, resulting in an 82.3% completion rate.

Table 2. Demographic Characteristics of Respondents

<table>
<thead>
<tr>
<th></th>
<th>Mothers</th>
<th>Gymnasts</th>
<th>Gymnasts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 42</td>
<td>n = 42</td>
<td>n = 42</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42 (100%)</td>
<td>42 (100%)</td>
<td></td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>45.29 ± 5.061</td>
<td>13 ± 1.938</td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>2 (4.8%)</td>
<td>2 (4.8%)</td>
<td></td>
</tr>
<tr>
<td>Black/African American</td>
<td>1 (2.4%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>38 (90.5%)</td>
<td>34 (81.0%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1 (2.4%)</td>
<td>2 (4.8%)</td>
<td></td>
</tr>
<tr>
<td>Mixed Race</td>
<td>0</td>
<td>3 (7.1%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>1 (2.4%)</td>
<td></td>
</tr>
<tr>
<td><strong>Dyad Relationship</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological</td>
<td>42 (100%)</td>
<td>42 (100%)</td>
<td></td>
</tr>
<tr>
<td><strong>Days/Week Living Together</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 days</td>
<td>3 (7.1%)</td>
<td>5 (11.9%)</td>
<td></td>
</tr>
<tr>
<td>7 days</td>
<td>39 (92.9%)</td>
<td>37 (88.1%)</td>
<td></td>
</tr>
<tr>
<td><strong>Level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7 (16.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>6 (14.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>4 (9.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>10 (23.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>5 (11.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>10 (23.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hours Spent in the Gym/Week</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5</td>
<td>1 (2.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.0</td>
<td>5 (11.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.0</td>
<td>12 (28.6%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.0</td>
<td>2 (4.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.0</td>
<td>9 (21.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.0</td>
<td>3 (7.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.0</td>
<td>9 (21.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.0</td>
<td>1 (2.4%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Of those who participated, the mean age of mothers was 45.29 years ± 5.06 years. The mean age of gymnasts was 13 years ± 1.94 years. Of the 42 mothers, 2 (4.8%) identified as Asian, 1 (2.4%) identified as Black/African American, 38 (90.5%) identified as Caucasian, and 1 (2.4%) identified as Hispanic/Latino. Of the 42 gymnasts, 2 (4.8%) identified as Asian, 34 (81%) identified as Caucasian, 2 (4.8%) identified as Hispanic/Latino, 3 (7.1%) identified as mixed race, and 1 (2.4%) identified as other. All mother-daughter dyads noted that their relationship was biological. Three mothers (7.1%) indicated that their daughter lives with them five days per week and 39 mothers (92.9%) indicated that their daughter lives with them seven days per week. However, five gymnasts (11.9%) indicated that they live with their mother five days per week and 37 (88.1%) indicated that they live with their mother seven days per week. It is unclear why there was a difference in notation between mothers and gymnasts. One dyad marked “other” for how many days the daughter lives with her mother. They both wrote that the daughter lives with her dad two evenings per week and every other weekend. I quantified this by estimating the number of days that the mother lives with her daughter each four weeks and dividing that by 4 to estimate the average number of days per week. Evenings during the week were counted as half days. Based on that calculation, the dyad lives together five days per week on average. Of the 42 gymnasts, seven participated in Level 4, six participated at Level 5, four participated at Level 6, ten participated at Level 7, five participated at Level 8, and ten participated at Level 9. Four gymnasts’ competitive levels were changed from the Xcel Program Division to the Junior Olympics Program equivalents. A Gold level in the Xcel Program is equivalent to a Level 4 in the Junior Olympics Program. Similarly, a Platinum level in the Xcel Program is equivalent to a 5 in the Junior Olympics Program. Regarding hours spent in the gym per week, 1 gymnast (2.4%) spends 7.5 hours, 5 gymnasts (11.9%) spend 9 hours, 12 gymnasts (28.6%) spend 12
hours, 2 gymnasts (4.8%) spend 13 hours, 9 gymnasts (21.4%) spend 15 hours, 3 gymnasts (7.1%) spend 16 hours, 9 gymnasts (21.4%) spend 20 hours, and 1 gymnast (2.4%) spends 22
hours.

Results of Survey Instruments

Scores from both the EAT-26 and the Family Fat Talk Questionnaire used in this study have been validated and historically have produced reliable data.\textsuperscript{14,17,26,42} Within the current study, EAT-26 (Part B) had a Cronbach’s alpha of 0.66 in the mothers and 0.20 in the gymnasts. The gymnasts’ EAT-26 reliability was suspected to be related to the small sample size. The Self subscale of the FFTQ had a Cronbach’s alpha of 0.85 in the mothers and 0.78 in the gymnasts. The Family subscale had a Cronbach’s alpha of 0.73 in the mothers and 0.88 in the gymnasts. The FFTQ as a whole had a Cronbach’s alpha of 0.78 in the mothers and 0.84 in the gymnasts. Demographics were self-reported by participants.

Results of Hypothesis Testing

Linear regressions represent the predictability of the relationships indicated (Table 3). In relationships marked as significant, the predictor was predictive of the criterion. The unstandardized beta ($B$) represents the slope of the line between the predictor and the criterion, meaning that the criterion variable increased by the unstandardized beta for every one unit increase in the predictor variable. The coefficients standard error ($SE \ B$) represents the variability of the points on the regression line. A higher number in this column indicates increased
variability and a decreased likelihood of significance. The standardized beta (\( \beta \)) represents the strength of the relationship. The higher the standardized beta, the higher the predictability of the variable on the criterion. The \( t \) test was calculated for the predictor variable and was used to calculate the \( p \)-value. The significance level (\( p \)-value) assesses the significance of the relationship. Significance was assessed for a \( p \)-value of less than 0.05.

Table 3. Linear Regressions

<table>
<thead>
<tr>
<th>Predictor: mEATA(^a)</th>
<th>B</th>
<th>SE B</th>
<th>( \beta )</th>
<th>( t )</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion: dEATA(^b)</td>
<td>Constant</td>
<td>2.361</td>
<td>0.568</td>
<td>4.156</td>
<td>&lt; 0.001***</td>
</tr>
<tr>
<td></td>
<td>mEATA(^a)</td>
<td>0.167</td>
<td>0.074</td>
<td>0.334</td>
<td>2.244</td>
</tr>
<tr>
<td></td>
<td>( r^2 = 0.112 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor: mSelfSubscale(^d)</td>
<td>Constant</td>
<td>8.980</td>
<td>1.488</td>
<td>6.036</td>
<td>&lt; 0.001***</td>
</tr>
<tr>
<td>Criterion: dSelfSubscale(^c)</td>
<td>mSelfSubscale(^d)</td>
<td>0.082</td>
<td>0.101</td>
<td>0.127</td>
<td>0.807</td>
</tr>
<tr>
<td></td>
<td>( r^2 = 0.016 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor: dFamilySubscale(^e)</td>
<td>Constant</td>
<td>8.409</td>
<td>1.286</td>
<td>6.537</td>
<td>&lt; 0.001***</td>
</tr>
<tr>
<td>Criterion: dSelfSubscale(^c)</td>
<td>dFamilySubscale(^e)</td>
<td>0.143</td>
<td>0.100</td>
<td>0.220</td>
<td>1.424</td>
</tr>
<tr>
<td></td>
<td>( r^2 = 0.048 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor: dSelfSubscale(^e)</td>
<td>Constant</td>
<td>0.526</td>
<td>1.301</td>
<td>0.404</td>
<td>&lt; 0.001***</td>
</tr>
<tr>
<td>Criterion: dEATA(^b)</td>
<td>dSelfSubscale(^e)</td>
<td>0.277</td>
<td>0.123</td>
<td>0.335</td>
<td>2.249</td>
</tr>
<tr>
<td></td>
<td>( r^2 = 0.112 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor: dSelfSubscale(^e)</td>
<td>Constant</td>
<td>5.369</td>
<td>1.666</td>
<td>3.224</td>
<td>0.003**</td>
</tr>
<tr>
<td>Criterion: dHours(^f)</td>
<td>dSelfSubscale(^e)</td>
<td>0.328</td>
<td>0.111</td>
<td>0.423</td>
<td>2.950</td>
</tr>
<tr>
<td></td>
<td>( r^2 = 0.179 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* \( p < 0.05, ** p < 0.01, *** p < 0.001 \)
\(^a\)mEATA = mothers’ EAT-26 (Part B Score)
\(^b\)dEATA = daughters’ EAT-26 (Part B Score)
\(^c\)dSelfSubscale = daughters’ Self subscale score from FFTQ
\(^d\)mSelfSubscale = mothers’ Self subscale score from FFTQ
\(^e\)dFamilySubscale = daughters’ Family subscale score from FFTQ
\(^f\)dHours = hours daughters spent in the gym
In Figure 1, Linear Regression of mEATA and dEATA, the weak positive linear regression residual is displayed and compared to a normal bell curve in a histogram to assess the distribution. The residuals are the result of the difference between the observed and predicted values. There appears to be a slight positive skewedness in the distribution of the residuals, but due to the small sample size it is accepted.

Figure 1. Linear regression of mEATA and dEATA.
Research Hypothesis 1 (Mother and daughter EAT-26 [Part B] scores will show that eating attitudes of adolescents in an aesthetic sport [gymnastics] are positively correlated to their mothers’ eating attitudes) was tested using a correlation, two-tailed test for significance and simple linear regression to determine whether there is a relationship between eating attitudes of mothers and adolescent daughters in an aesthetic sport (gymnastics) using the raw scores from EAT-26 (Part B). Mothers’ EAT-26 (Part B) scores (mEATA) and gymnasts’ EAT-26 (Part B) scores (dEATA) showed a statistically significant positive linear relationship \( r = 0.334, p < 0.05 \) (see Table 3). However, the strength of this relationship was weak (see Figure 1). Based on the \( r^2 \) value (0.112), 11.2% of daughters’ eating attitudes are explained by their mothers’ eating attitudes (see Table 3). Mothers’ EAT-26 (Part B) scores were predictive of daughters’ EAT-26 (Part B) scores. Therefore, the null hypothesis was rejected.

Of the 42 mothers who completed EAT-26 (Part B), one scored > 20 and thus was noted to be at risk for adverse eating attitudes. The average EAT-26 (Part B) score recorded from mothers was 5.8, which indicated no risk overall. There was one item missing in a mother’s EAT-26 (Part B) questionnaire. In order to calculate the EAT-26 (Part B) score, I took the mean of the variable and filled it in for the missing item. No gymnasts who completed EAT-26 (Part B) scored >20, indicating lack of significant risk in their eating attitudes. The average EAT-26 (Part B) score recorded from gymnasts was 3.3, which indicated no risk overall.

In Figure 2, Scatterplot of Linear Regression of mEATA and dEATA, residual data for the linear regression of mothers’ eating attitudes and gymnasts’ eating attitudes is presented. With an \( r \) value of 0.334, there was weak positive correlation. The scatterplot of the residuals displays data points in a random pattern, indicating that the data was a good fit for a linear model.
Adverse Eating Behaviors in Mothers and Gymnast Daughters

Research Hypothesis 2 (Mother and daughter EAT-26 [Part C] scores will show that eating behaviors of adolescents in an aesthetic sport [gymnastics] are positively correlated to their mothers’ eating behaviors) was tested using a binary logistic regression to determine whether there is a relationship between eating behaviors of mothers and adolescent daughters in an aesthetic sport (gymnastics) using mothers’ raw scores from EAT-26 (Part C; mEATB) and gymnasts’ raw scores from EAT-26 (Part C; dEATB). The current study found no significant relationship between the risk for eating behaviors in adolescent gymnasts and their mothers (Cox...
and Snell $r^2 = 0.019$, Nagelkerke $r^2 = 0.036$, $p = 0.999$; Table 4). These findings do not support the research hypothesis and therefore the null hypothesis was not rejected.

Table 4. Logistic Regressions

<table>
<thead>
<tr>
<th>Predictor:</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp (B)</th>
<th>95% C.I. for Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>mEATB</td>
<td>19.286</td>
<td>5.42</td>
<td>0</td>
<td>1</td>
<td>0.999</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.917</td>
<td>0.47</td>
<td>16.017</td>
<td>1</td>
<td>0</td>
<td>147</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criterion:</td>
<td>Cox and Snell $r^2 = 0.019$</td>
<td>Nagelkerke $r^2 = 0.036$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor:</td>
<td>dSelfSubscale</td>
<td>0.459</td>
<td>0.17</td>
<td>7.256</td>
<td>1</td>
<td>0.007*</td>
<td>1.583</td>
<td>1.133</td>
</tr>
<tr>
<td>Constant</td>
<td>-7.269</td>
<td>2.15</td>
<td>12.371</td>
<td>1</td>
<td>0</td>
<td>0.001*</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Criterion:</td>
<td>Cox and Snell $r^2 = 0.227$</td>
<td>Nagelkerke $r^2 = 0.438$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*mEATB = mothers’ EAT-26 (Part C Score)*

*dEATB = daughters’ EAT-26 (Part C Score)*

*dSelfSubscale = daughters’ Self subscale score from FFTQ*

Logistic regressions represent the predictability of the relationships indicated. Logistic regressions were used because EAT-26 (Part C) had a limited number of possible scores (at-risk or not at risk) and was not scored continuously (see Table 4). B represents the unstandardized regression weight. A positive B value would indicate that the predictor variable would predict an at risk score. The standard error (S.E.) represents the variability of the points on the regression line. A higher number in this column indicates increased variability and a decreased likelihood of significance. Wald represents a test calculated for the predictor variable and used to calculate the
$p$-value. The significance level ($p$-value) assesses the significance of the relationship.

Significance was assessed for a $p$-value of less than 0.05. $\text{Exp}(B)$ represents the odds ratio, which measures likelihood. With each one unit increase of the predictor variable, the criterion variable would increase by the odds ratio. The 95% confidence interval (C.I.) represents with 95% certainty the values that the odds ratio is within. Cox and Snell $r^2$ and Nagelkerke $r^2$ are pseudo $r^2$ values.

Of the 42 mothers who completed EAT-26 (Part C), three scored 1, indicating that they are at risk for adverse eating behaviors. The majority (92.9%) of EAT-26 (Part C) scores recorded from mothers was 0, which indicated no risk overall. Of the 42 gymnasts who completed EAT-26 (Part C), five scored 1, which suggests that they are at risk for adverse eating behaviors. The majority (88.1%) of EAT-26 (Part C) scores recorded from gymnasts were 0, which indicated no risk overall.

Omnibus tests represent whether the explained variance in the data is significantly greater than the unexplained variance (Table 5). The significance ($p$-value) represents the probability of obtaining the chi-square value, assuming that the null hypothesis is true. If the significance ($p$-value) is less than 0.05, the relationship can be predicted. The Hosmer and Lemeshow test is a goodness-of-fit test, meaning it represents how well the data fits in the model. A low significance ($p$-value) indicates that the data is not a good fit for the model.
### Table 5. Omnibus Tests and Hosmer and Lemeshow Tests

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Omnibus Test</th>
<th>Chi-square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>mEATBa</td>
<td>Omnibus Test</td>
<td>0.791</td>
<td>1</td>
<td>0.374</td>
</tr>
<tr>
<td>dEATBb</td>
<td>Hosmer and Lemeshow Test</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>dSelfSubscalec</td>
<td>Omnibus Test</td>
<td>10.819</td>
<td>1</td>
<td>0.001**</td>
</tr>
<tr>
<td>dEATBa</td>
<td>Hosmer and Lemeshow Test</td>
<td>5.257</td>
<td>3</td>
<td>0.154</td>
</tr>
</tbody>
</table>

* p < 0.05, ** p < 0.01, *** p < 0.001

*a mEATB = mothers’ EAT-26 (Part C Score)
*b dEATB = daughters’ EAT-26 (Part C Score)
*c dSelfSubscale = daughters’ Self subscale score from FFTQ

### Presence of Fat Talk in Mothers and Gymnast Daughters

Research Hypothesis 3 (Mother and daughter FFTQ will show that use of fat talk in adolescents in an aesthetic sport [gymnastics] is positively correlated to the mother’s use of fat talk) was tested using a correlation, two-tailed test for significance and simple linear regression to determine whether there is a relationship between mothers’ use of fat talk and adolescent daughters’ use of fat talk using the raw scores from Family Fat Talk Questionnaire. Daughters’ use of fat talk was assessed by the Self subscale (dSelfSubscale) of the gymnasts’ survey. Mothers’ use of fat talk was assessed once by the mothers’ Self subscale (mSelfSubscale) of the survey and again by their daughters’ perception of their fat talk in the daughters’ Family subscale (dFamilySubscale). When using the mothers’ Self subscale, the current study found no significant relationship between mothers’ and daughters’ use of fat talk ($r = 0.127$, $p = 0.425$). Based on the $r^2$ value (0.048), only 4.8% of daughters’ use of fat talk is explained by their perception of their mothers’ use of fat talk (see Table 3). When using the daughters’ Family subscale, the current study found no significant relationship between mothers’ and daughters’
use of fat talk \((r = 0.220, p = 0.162)\). Based on the \(r^2\) value (0.016), only 1.6% of daughters’ use of fat talk is explained by their mothers’ self-reported use of fat talk (see Table 3). These findings do not support the research hypothesis and therefore the null hypothesis was accepted.

Of the 42 mothers who completed Family Fat Talk Questionnaire, all completed both the Self subscale and the Family subscale. The mothers’ average Self subscale score was \(13.976 \pm 4.677\) and their average Family subscale score was \(10.143 \pm 2.553\). Of the 42 gymnasts who completed Family Fat Talk Questionnaire, all completed both the Self subscale and the Family subscale. The gymnasts’ average Self subscale score was \(10.119 \pm 3.014\) and their average Family subscale score was \(12.0 \pm 4.643\). Each subscale is scored from 8 to 40 and is scored continuously. Presence of fat talk increases as the score increases.

### Adverse Eating Attitudes and Fat Talk

In Figure 3, Linear Regression of dSelfSubscale and dEATA, the weak positive linear regression residual is displayed and compared to a normal bell curve in a histogram to assess the distribution. The residuals are the result of the difference between the observed and predicted values. There appears to be a slight positive skewness in the distribution of the residuals, but due to the small sample size it is accepted.
Research Hypothesis 4 (Gymnasts EAT-26 [Part B] and FFTQ will show that use of fat talk in adolescents in an aesthetic sport [gymnastics] is positively correlated with high-risk eating attitudes) was tested using a correlation, two-tailed test for significance and simple linear regression to determine whether the use of fat talk is correlated with high-risk eating attitudes in adolescent gymnasts using the raw scores from the gymnasts’ EAT-26 (Part B) and the Self subscale from the gymnasts’ Family Fat Talk Questionnaire. Gymnasts’ EAT-26 (Part B) scores and gymnasts’ Self subscale scores showed a statistically significant positive linear relationship ($r = 0.335, p < 0.05$). However, the strength of this relationship was weak (see Figure 3). Based on the $r^2$ value (0.112), 11.2% of daughters’ eating attitudes are explained by their own use of fat
talk (see Table 3). Gymnasts’ EAT-26 (Part B) scores were predictive of their Self subscale scores. Therefore, the null hypothesis was rejected.

In Figure 4, Scatterplot of Linear Regression of dSelfSubscale and dEATA, residual data for the linear regression of gymnasts’ eating attitudes and gymnasts’ fat talk Self subscale is presented. With an $r$ value of 0.335, there was weak positive correlation. The scatterplot of the residuals displays data points in a random pattern, indicating that the data was a good fit for a linear model.

Figure 4. Scatterplot of linear regression of dSelfSubscale and dEATA.
Adverse Eating Behaviors and Fat Talk

Research Hypothesis 5 (Gymnasts’ EAT-26 [Part C] and FFTQ will show that use of fat talk in adolescents in an aesthetic sport [gymnastics] is positively correlated with high-risk eating behaviors) was tested using a binary logistic regression to determine whether the use of fat talk is correlated with high-risk eating behaviors in adolescent gymnasts using the raw scores from the gymnasts’ EAT-26 (Part C) and the Self subscale from the gymnasts’ FFTQ. Gymnasts’ EAT-26 (Part C) scores and gymnasts’ Self subscale scores showed a statistically significant positive linear relationship (Cox and Snell $r^2 = 0.227$, Nagelkerke $r^2 = 0.438$, $p = 0.007$; see Table 4). The omnibus test is significant, indicating that there is a relationship between the use of fat talk in adolescent gymnasts and high-risk eating behaviors (see Table 5). The Hosmer and Lemeshow test is not significant, confirming this relationship (see Table 5). With each unit increase on the Self subscale of the FFTQ, the odds of marking an at-risk eating behavior on EAT-26 (Part C) increased by 1.583 (see Table 4). Therefore, the null hypothesis was rejected.

Additional Data Analysis

Gymnasts’ scores from the Self subscale of the FFTQ and the hours spent in the gym per week was tested using a correlation, two-tailed test for significance and simple linear regression to determine whether the number of hours spent in the gym per week is correlated to their use of fat talk.

Gymnasts’ Self subscale scores and the number of hours spent in the gym per week showed a statistically significant positive linear relationship ($r = 0.423$, $p = 0.005$). However, the
strength of this relationship was weak (Figure 5). Based on the \( r^2 \) value (0.179), 17.9% of gymnasts’ use of fat talk was explained by the number of hours they spent in the gym per week (see Table 3). Gymnasts’ number of hours in the gym per week was predictive of their use of fat talk.

In Figure 5, Linear Regression of dHours and dSelfSubscale, the weak positive linear regression residual is displayed and compared to a normal bell curve in a histogram to assess the distribution. The residuals are the result of the difference between the observed and predicted values. There appears to be a slight positive skewedness in the distribution of the residuals, but due to the small sample size it is accepted.

Figure 5. Linear regression of dHours and dSelfSubscale.
In Figure 6. Scatterplot of Linear Regression of dHours and dSelfSubscale, residual data for the linear regression of the number of hours spent in the gym per week and gymnasts’ fat talk Self subscale is presented. With an $r$ value of 0.423, there was weak positive correlation. The scatterplot of the residuals displays data points in a slight cone shape, but due to the small sample size, there is not enough data to indicate that the data was not a good fit for a linear model.

![Figure 6. Scatterplot of linear regression of dHours and dSelfSubscale.](image)

The null hypothesis was rejected when assessing three out of five hypotheses (Table 6). Mothers’ eating attitudes were predictive of daughters’ eating attitudes. Gymnasts’ use of fat talk was predictive of both their eating attitudes and eating behaviors. Additional results included that
gymnasts’ number of hours in the gym per week was predictive of their use of fat talk (dSelfSubscale; $p = 0.005$).

Table 6. Summary of Results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Variables</th>
<th>$p$-value</th>
<th>Ability to Reject Null Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mother and daughter EAT-26 (Part B) will show that eating attitudes of adolescents in an aesthetic sport (gymnastics) are positively correlated to their mothers’ eating attitudes.</td>
<td>dEATA mEATA</td>
<td>0.030*</td>
<td>Reject</td>
</tr>
<tr>
<td>2. Mother and daughter EAT-26 (Part C) will show that eating behaviors of adolescents in an aesthetic sport (gymnastics) are positively correlated to their mothers’ eating behaviors.</td>
<td>dEATB mEATB</td>
<td>0.999</td>
<td>Fail to Reject the Null Hypothesis</td>
</tr>
<tr>
<td>3. Mother and daughter FFTQ will show that use of fat talk in adolescents in an aesthetic sport (gymnastics) is positively correlated to their mothers’ use of fat talk.</td>
<td>dSelfSubscale mSelfSubscale</td>
<td>0.425</td>
<td>Fail to Reject the Null Hypothesis</td>
</tr>
<tr>
<td>4. Gymnasts EAT-26 (Part B) and FFTQ will show that use of fat talk in adolescents in an aesthetic sport (gymnastics) is positively correlated with high-risk eating attitudes.</td>
<td>dEATA dSelfSubscale</td>
<td>0.030*</td>
<td>Reject</td>
</tr>
<tr>
<td>5. Gymnasts EAT-26 (Part C) and FFTQ will show that use of fat talk in adolescents in an aesthetic sport (gymnastics) is positively correlated with high-risk eating behaviors.</td>
<td>dEATB dSelfSubscale</td>
<td>0.007**</td>
<td>Reject</td>
</tr>
</tbody>
</table>

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
CHAPTER FIVE

DISCUSSION

This study examined the influence of maternal eating attitudes, behaviors, and fat talk on adolescent, non-elite, competitive-level gymnasts’ eating attitudes, behaviors, and fat talk. Increasing understanding of the maternal role in the development of eating disorders and disordered eating is crucial in the development of eating disorder prevention programs. Understanding the maternal role does not place blame on mothers; rather it allows for the empowerment of mothers to make changes and lead by example. Additionally, this study assessed the effect of gymnasts’ level of fat talk on their own eating attitudes and behaviors. Fat talk was a focus in adolescents because it is known that fat talk represents one way the adolescents enforce social norms, call for support from others, ask for affirmation that they are not fat and do fit in with the culture, and as an apology for behavior that does not fit the cultural norms. Increasing understanding of these social norms is another way to prevent eating disorders and assist in the treatment of eating disorders. It was expected that higher levels of adverse maternal eating attitudes and eating behaviors would correlate to higher levels of adverse eating attitudes and eating behaviors in the gymnasts. Similarly, it was expected that higher levels of fat talk in mothers would be associated with higher levels of fat talk in their daughters. Both expected outcomes were based on the concept of maternal modeling, which entails children
modeling their actions or attitudes based on their mothers’. Furthermore, it was expected that increased use of fat talk in the gymnasts would correlate to higher levels of adverse eating attitudes and eating behaviors in themselves. This outcome was expected because of the association between fat talk with eating attitudes and body image dissatisfaction. Participation in fat talk was associated with adverse eating attitudes in adolescent females and their mothers. Additionally, fat talk was associated with higher levels of body dissatisfaction and dietary restriction in females between 18 and 25 years old.

In the current study, mothers and daughters both completed Part B of EAT-26 to assess eating attitudes, Part C of EAT-26 to examine eating behaviors, and a modified version of the FFTQ to evaluate the use of fat talk. Gymnasts were also asked to report their competitive level of gymnastics and how many hours they spend in the gym per week.

In the current study, only one mother (2.4%) scored an EAT-26 score that indicated that she was at risk for disordered eating or an eating disorder based on her eating attitudes. None of the gymnasts scored high enough on EAT-26 (Part B) to indicate high-risk eating attitudes. In a study using EAT-26 to assess adverse eating attitudes in the general population, 6% of adolescent girls and 5% of the mothers scored above 20, indicating their eating attitudes put them at risk for disordered eating or an eating disorder. This difference in findings may be related to the small sample size of the current study.

In the current study, three mothers (7.1%) and five gymnasts (11.9%) were at risk for adverse eating behaviors. There are no known studies that isolate EAT-26 (Part C) in mother-daughter dyads; therefore, there are no statistics to compare to.

The modified FFTQ was assessed in two parts in the current study: the Self subscale and the Family subscale. When completing the Self subscale, the mother and gymnast assessed their
own use of fat talk. When completing the Family subscale, the mother and gymnast assessed each other’s use of fat talk. The mothers’ average Self subscale score was 13.976 ± 4.677 and their average Family subscale score was 10.143 ± 2.553. In the validation of the original FFTQ, women with a mean age of 27.9 ± 4.0 scored an average of 17.9 ± 6.6 on the Self subscale and an average of 19.0 ± 6.6 on the Family subscale.\(^4\) This difference may be related to a small sample size as well as measurement of different and categorized age groups in the current study.

Although the results from this study do not suggest a greater prevalence for risk than the general population for adverse eating attitudes or prevalence of fat talk, results do support the notion that these symptoms exist among gymnasts and their mothers. Subsequent discussion will consist of results from the five hypotheses examined in this study.

Discussion of Hypotheses

**Adverse Eating Attitudes in Mothers and Gymnast Daughters**

The results of the current study showed a statistically significant relationship between the risk for eating attitudes in adolescent gymnasts and their mothers, resulting in the rejection of the null hypothesis. Other studies have demonstrated a similar relationship.\(^8,\)\(^19\) In a general population of mothers and adolescent daughters, a statistically significant relationship between mothers’ eating attitudes and daughters’ eating attitudes was found using EAT-26 (Part B).\(^8\) Interestingly, a longitudinal study found that fathers’ EAT-26 scores were predictive of their daughters’ ChEAT score eight years later. The mothers’ EAT-26 scores were not predictive.\(^19\)
This result may indicate that parental modeling may be as important as singling out maternal modeling.

Adverse Eating Behaviors in Mothers and Gymnast Daughters

The results of the current study showed a statistically insignificant relationship between the risk for eating behaviors in adolescent gymnasts and their mothers, resulting in failure to reject the null hypothesis, with support not provided for the research hypothesis. However, these findings may be explained by the young age of the adolescents in the current study. While the study population was inclusive of adolescents between 11 and 21 years old, the average age was 13 ± 1.938 years. I was available for questions while the gymnasts were taking the questionnaires. A few questions were asked regarding EAT-26 (Part C). Specifically, many gymnasts asked about the question that asked, “In the past 6 months have you exercised more than 60 minutes per day to lose or control your weight?” They were unsure whether their time spent in the gym should be taken into account when answering this question. I encouraged them to consider the purpose behind their time spent in the gym. Another question asked, “In the last 6 months, have you ever used laxatives, diet pills or diuretics (water pills) to control your weight or shape?” No questions were asked, but it is questionable as to whether a 13-year-old would be familiar with what a diuretic or laxative is regardless of whether they had ever taken one before. With the young age of the gymnasts, the questions on EAT-26 (Part C) may have been difficult to understand.

Additionally, due to the sensitive nature of the survey, participants may not have felt comfortable truthfully answering the EAT-26 (Part C) portion of the questionnaire. The
discomfort for the gymnasts may have come from being in the same room as their peers, even though they were spread out. The discomfort for the mothers may have come from being at home where their family may have been around or from the questions themselves. The research on EAT-26 (Part C) is limited. No studies have been found that compare EAT-26 (Part C) in mother-daughter dyads.

**Presence of Fat Talk in Mothers and Gymnast Daughters**

In the current study, no significant relationship was found between mothers’ and daughters’ use of fat talk; therefore, I accepted the null hypothesis. However, these findings may be explained by the data collection method of a purposive sample and snowball sample rather than a random sampling since the gymnasts were within the networks of the researcher. Additionally, a variable not assessed in this study is pubertal development. Higher levels of body surveillance, body shame and disordered eating have been associated with pubertal development in adolescent gymnasts. The young age of the adolescents (13 ± 1.938 years) in the current study may have played a role in the lack of findings. According to Johns Hopkins Medicine, the beginning of puberty varies from 8 to 13 in girls. If pubertal development was not yet prevalent or was low in the adolescents in the current study, body surveillance may have been lower than if the study population had more pubertal development. Higher levels of fat talk have been associated with higher levels of body surveillance in women between 18 and 25 years old. The potential for lower levels of body surveillance may help explain the lack of findings related to the relationship between use of fat talk in mothers and daughters.
Another study has noted a significant relationship between use of fat talk in mothers and daughters. A significant relationship between mothers’ and daughters’ fat talk was found in daughters between 18 and 25 years old and their mothers.

Adverse Eating Attitudes and Fat Talk

Results from the current study determined there was a statistically significant relationship between use of fat talk and adverse eating attitudes in adolescent gymnasts. This finding led me to reject the null hypothesis. A study using mother-daughter dyads in the general population, rather than using gymnasts, found that adolescents’ use of fat talk was related to their own eating pathology. In college-aged females, verbally participating in fat talk was more strongly associated with dietary restriction than listening to friends participate in fat talk. While EAT-26 measures more than dietary restraint and the population was older than the adolescent population of the current study, it reiterates the significant effect that use of fat talk has on eating attitudes.

Adverse Eating Behaviors and Fat Talk

Results from the current study determined there was a statistically significant relationship between use of fat talk and adverse eating behaviors in adolescent gymnasts. This finding led me to reject the null hypothesis. As previously stated, research on EAT-26 (Part C) is limited and studies that compare EAT-26 (Part C) in mother-daughter dyads have not been found.

It is hypothesized that this relationship is related to the association between fat talk and body dissatisfaction, indicating a desire to change one’s body. Verbal participation in fat talk was
associated with higher levels of body dissatisfaction in women between 18 and 25 years old.\textsuperscript{21} Three out of the five questions on EAT-26 (Part C) specifically ask about behaviors “used to control your weight or shape.” Regardless of not using that verbiage, the other two questions in EAT-26 (Part C) may reflect an attempt to change one’s body. Therefore, the relationship between fat talk and adverse eating behaviors is hypothesized to be related to body dissatisfaction and the desire to change one’s weight or shape.

**Additional Data Analysis**

In the current study, a significant relationship was found between gymnasts’ use of fat talk and the number of hours they spent in the gym per week. There are no known studies that assess the relationship between hours spent in the gym per week and use of fat talk in adolescent gymnasts. There was a study that assessed the predictive value of time spent training and body shame. Interestingly, findings suggested that time spent training decreased levels of body shame in adolescent gymnasts.\textsuperscript{27} The researchers had hypothesized that this finding may relate to the increased time training resulting in a body shape or size that fits into the internalized thin ideal or resulting in increased confidence. Body shame is not synonymous with use of fat talk; however, this finding demonstrates that more research is needed to understand how time spent in the gym affects adolescent gymnasts’ perceptions of themselves.
Conclusion

Findings from this study have shown that mothers’ eating attitudes were predictive of their daughters’ eating attitudes in the adolescent gymnast population. However, mothers’ eating behaviors were not predictive of their daughters’ eating behaviors. Similarly, mothers’ use of fat talk was not predictive of their daughters’ use of fat talk. The influence of mothers on their adolescent, gymnast daughters was only found in eating attitudes. As previously discussed, EAT-26 (Part C) is not often assessed independently and may not be broad enough in scope to measure the predictive value of risk for adverse eating behaviors in mothers and daughters. Additionally, the sensitive nature of the survey questions and the small sample size of this study may have affected the ability of EAT-26 (Part C) and the FFTQ to measure predictive value between mothers and daughters.

The influence of fat talk on eating attitudes was assessed in this study. Adolescent gymnasts’ use of fat talk was predictive of their own eating attitudes. Similarly, adolescent gymnasts’ use of fat talk was predictive of their own eating behaviors. Both eating attitudes and behaviors were influenced by adolescent gymnasts’ use of fat talk.

Strengths

A strength of this study was using instruments that both had high reliability in previous studies. Both EAT-26 and the FFTQ had achieved high reliability with adolescents. Another strength was the inclusion of adolescents of all ages. Additionally, this study assessed a high-risk population. Moreover, the population studied was very specific and was defined based on
previous research. The design of the study was efficient from a monetary and time perspective. While the biggest costs were for postage stamps and gift cards, both were used efficiently. Postage stamps made completing the survey as convenient as possible for the mothers. It allowed them to save time by putting the letter in the mailbox rather than bringing it into the gym, which likely improved the response rate. Gift cards were used as an incentive for the mothers to return the surveys and also likely improved the response rate. Time was used efficiently with the gymnasts as well. I only collected data before and after the high school gymnastics season in order to avoid having to make extra trips back to the gyms due to gymnast absences. Another strength in the design of the study is that having mothers mail their questionnaires may have increased truthfulness in their response due to lack of worry that their daughter would see their response. Similarly, having the gymnasts fill out their surveys in the gym may have decreased their worry of having a parent or family member view their responses. Through using the modified FFTQ, mothers and daughters both reported their own use of fat talk as well as their perception of each other’s use of fat talk. This provided more information, and the similarity of subscale averages increased confidence in the accuracy of the self-reported data.

Limitations

A limitation of this study is the small sample size of 42 dyads. While the EAT-26 has achieved high reliability in the past with adolescents, it was not originally validated for adolescents. EAT-26 was originally validated with those suffering from anorexia nervosa; therefore, the risk it assesses may be more relevant for anorexia nervosa than bulimia nervosa or binge eating disorder. When reliability was assessed in the current study, it was found to be very
low in the adolescent gymnasts. Similarly, the FFTQ has achieved high reliability in the past with adolescents, but it was not originally validated for adolescents. The age of the gymnasts also could have contributed to misreporting based on misunderstanding or misinterpretation of questions on the questionnaire. A limitation to the study is that all of the questionnaires were self-reported and respondents might not have been truthful. Additional limitations come from lack of diversity both in gender and in race in the study sample. The exclusion of males is a limitation but was necessary based on my access to the gymnastics population. The majority of mothers (90.5%) and daughters (81.0%) identified as Caucasian. While this study aimed to include the entire age group of adolescents from 11 to 21 years old, the average age of adolescents was 13 ± 1.938. Another limitation to the sample population is that it was purposive and non-random. Again, this relates to my access to the adolescent gymnast population.

Future Research

Future studies should be similarly conducted to provide further insight into this sport-specific population, with further emphasis on increasing the sample size, incorporating fathers, and including male gymnasts in their participant recruitment efforts. Assessing fat talk within a home, including both parents and siblings, may help determine how family members influence each other’s fat talk. Maternal modeling and fat talk should continue to be studied regardless of the insignificant relationship found in the current study. A relationship had been found with daughters who were over 18 years old and in a larger sample. Therefore, continuing to study this concept in adolescents is necessary to understand mothers’ influence of fat talk on their daughters.
While there was an overall lack of racial diversity in this study population, five gymnasts (11.9%) either identified as biracial or as a different race than their mother. Future research would benefit from increasing understanding the role of maternal modeling and use of fat talk within a multiracial home.

Based on the finding that fat talk has a relationship with hours spent in the gym per week, studies should include coaching staff as well as assess eating attitudes and fat talk within a team. Understanding the culture at different gyms may provide insight into where eating disorder prevention efforts would be most valuable. The increased time at the gym is presumed to be associated with decreased time spent at home. It would be valuable to understand how this shift in where time is spent and possibly where meals are consumed relates to maternal modeling.

Implications for Dietetic Practice

The findings from this study add value to the collective pool of research that aims to improve prevention of eating disorders. Understanding what the prevalent risk factors are within the high-risk population of aesthetic, adolescent athletes can help dietitians gear prevention programs specifically to those groups. These prevention programs may include providing information to parents and coaches due to their high level of involvement in the aesthetic adolescent athletes’ lives. Furthermore, if a dietitian were treating an adolescent aesthetic athlete for disordered eating or an eating disorder, these findings may help in understanding predisposing or perpetuating risk factors.
REFERENCES


APPENDIX A

PERMISSION TO RECRUIT IN GYMNASTICS GYMS
Re: NIU Master's Thesis

Kathie Gebhardt <kathiecarygym@gmail.com>
Thu 7/25/2019 2:44 PM
To: Madisyn Rozner <madisyn.rozner@outlook.com>

Yes, I approve.
Kathie Gebhardt
Cary Gymnastics Center

On Thu, Jul 25, 2019 at 2:28 PM Madisyn Rozner <madisyn.rozner@outlook.com> wrote:

Hi Kathie,

My name is Madisyn Rozner and I'm a graduate student and dietetic intern at Northern Illinois University. I am working on my master's thesis and I am seeking your permission to allow gymnasts and parents at your facility to participate in a research study I am conducting for my thesis to fulfill the requirements of my master's degree. All participation would be voluntary.

The purpose of the study is to increase understanding of the influence of mothers' eating attitudes and behaviors on their daughters. The study also aims to increase understanding of the relationship between social interactions regarding weight and eating attitudes and behaviors in this population of aesthetic, adolescent, non-elite, competitive gymnasts. Research shows that mothers influence daughters' eating attitudes and behaviors, and this influence can be both negative and positive. This study aims to create a better understanding of factors related to adolescent gymnasts' health, so that future wellness and prevention programs can be more effective and can take into account the power that mothers have in working to promote overall well-being in their daughters.

Data will be kept confidential and no names will be included in the study. The gymnasts recruited will be between 11 and 21 years old. Participation in the study will take between 15 and 30 minutes and will require participants to fill out questionnaires.

If you are willing to participate, by allowing me to recruit mother and daughter volunteers to serve as research participants, please respond to this email and grant me permission to use your facility to recruit mother-daughter dyads as research participants.

Also, if you have a parent club at your facility, please let me know if you would be willing to allow me to speak to the parents prior to the beginning of the study as part of my recruitment and consent process.

I greatly appreciate your help in this process. Thank you.

Sincerely,

Madisyn Rozner
Re: NIU Master's Thesis

Barbara Dunne <BDunne@palatineparks.org>
Mon 8/19/2019 7:11 PM
To: Madisyn Rozner <madisyn.rozner@outlook.com>

Madisyn
This email is granting you permission to use Palatine Gymnastics Club team girls to recruit mother-daughter dyads as research participants. Please contact me if you need additional information for this study.

Barb Dunne
Palatine Park District
Gymnastics Coordinator

From: Madisyn Rozner <madisyn.rozner@outlook.com>
Sent: Thursday, July 25, 2019 2:24:59 PM
To: Barbara Dunne <BDunne@palatineparks.org>
Subject: NIU Master's Thesis

Hi Barb,

My name is Madisyn Rozner and I’m a graduate student and dietetic intern at Northern Illinois University. I am working on my master’s thesis and I am seeking your permission to allow gymnasts and parents at your facility to participate in a research study I am conducting for my thesis to fulfill the requirements of my master’s degree. All participation would be voluntary.

The purpose of the study is to increase understanding of the influence of mothers’ eating attitudes and behaviors on their daughters. The study also aims to increase understanding of the relationship between social interactions regarding weight and eating attitudes and behaviors in this population of aesthetic, adolescent, non-elite, competitive gymnasts. Research shows that mothers influence daughters’ eating attitudes and behaviors, and this influence can be both negative and positive. This study aims to create a better understanding of factors related to adolescent gymnasts’ health, so that future wellness and prevention programs can be more effective and can take into account the power that mothers have in working to promote overall well-being in their daughters.

Data will be kept confidential and no names will be included in the study. The gymnasts recruited will be between 11 and 21 years old. Participation in the study will take between 15 and 30 minutes and will require participants to fill out questionnaires.

If you are willing to participate, by allowing me to recruit mother and daughter volunteers to serve as research participants, please respond to this email and grant me permission to use your facility to recruit mother-daughter dyads as research participants.

Also, if you have a parent club at your facility, please let me know if you would be willing to allow me to speak to the parents prior to the beginning of the study as part of my recruitment and consent process.
Re: October 10th Booster Club Meeting - NIU Master's Thesis

Scott <sjberk98@gmail.com>
Fri 8/30/2019 1:55 PM
To: Madisyn Rozner <madisyn.rozner@outlook.com>
Cc: Laura Seamon <laura_seamon@yahoo.com>; Amy White <amyckwhite@gmail.com>

Madisyn,

Sorry. Yes you may attend the meeting. How long will you need to explain yourself? I like to keep the meeting to about an one hour.

Scott Berk

Sent from my iPhone

On Aug 30, 2019, at 1:27 PM, Madisyn Rozner <madisyn.rozner@outlook.com> wrote:

Hi Mr. Berk,

I hope this email finds you well. I wanted to touch base and see if you have spoken with the other board members about the October 10th meeting. Please let me know if there is any other information that I could provide.

Thanks,

Madisyn Rozner

From: Scott <sjberk98@gmail.com>
Sent: Friday, July 26, 2019 7:40 PM
To: Madisyn Rozner <madisyn.rozner@outlook.com>
Cc: Bdunne@palatineparks.org <Bdunne@palatineparks.org>; Laura Seamon <laura_seamon@yahoo.com>; Meghan Haddad <moc.haddad@hotmail.com>; Amy White <amyckwhite@gmail.com>; Heidi Boesen <heidiboesen@att.net>; Alice Choi <aliceschoi@gmail.com>
Subject: Re: October 10th Booster Club Meeting - NIU Master's Thesis

Madisyn,

I spoke with Barb and I do not see a problem with this. I will need to run it by the other board members first and get back to you.

Thanks

Scott Berk

Sent from my iPhone

On Jul 25, 2019, at 2:36 PM, Madisyn Rozner <madisyn.rozner@outlook.com> wrote:
Hi Mr. Berk,

My name is Madisyn Rozner and I'm a graduate student and dietetic intern at Northern Illinois University. I am working on my master's thesis and I am seeking your permission to speak at the Booster Club Meeting on October 10th, 2019 about a research study I am conducting for my thesis to fulfill the requirements of my master's degree.

The purpose of the study is to increase understanding of the influence of mothers' eating attitudes and behaviors on their daughters. The study also aims to increase understanding of the relationship between social interactions regarding weight and eating attitudes and behaviors in this population of aesthetic, adolescent, non-elite, competitive gymnasts. Research shows that mothers influence daughters' eating attitudes and behaviors, and this influence can be both negative and positive. This study aims to create a better understanding of factors related to adolescent gymnasts’ health, so that future wellness and prevention programs can be more effective and can take into account the power that mothers have in working to promote overall well-being in their daughters.

Data will be kept confidential and no names will be included in the study. The gymnasts recruited will be between 11 and 21 years old. Participation in the study will take between 15 and 30 minutes and will require participants to fill out questionnaires.

Please let me know if you would be willing to allow me to speak to the parents prior to the beginning of the study as part of my recruitment and consent process.

I greatly appreciate your help in this process. Thank you.

Sincerely,

Madisyn Rozner
Re: NIU Master's Thesis

global1kmw@aim.com
Wed 9/11/2019 3:05 PM
To: madisyn.rozner@outlook.com <madisyn.rozner@outlook.com>

Madisyn,

We look forward to participating in the study.

Kurt Waller
AAG

-----Original Message-----
From: Madisyn Rozner <madisyn.rozner@outlook.com>
To: Kurt Waller <global1kmw@aim.com>
Sent: Wed, Sep 11, 2019 2:58 pm
Subject: NIU Master's Thesis

Hi Kurt,

My name is Madisyn Rozner and I’m a graduate student and dietetic intern at Northern Illinois University. I am working on my master’s thesis and I am seeking your permission to allow gymnasts and parents at your facilities to participate in a research study I am conducting for my thesis to fulfill the requirements of my master’s degree. All participation would be voluntary.

The purpose of the study is to increase understanding of the influence of mothers’ eating attitudes and behaviors on their daughters. The study also aims to increase understanding of the relationship between social interactions regarding weight and eating attitudes and behaviors in this population of aesthetic, adolescent, non-elite, competitive gymnasts. Research shows that mothers influence daughters’ eating attitudes and behaviors, and this influence can be both negative and positive. This study aims to create a better understanding of factors related to adolescent gymnasts’ health, so that future wellness and prevention programs can be more effective and can take into account the power that mothers have in working to promote overall well-being in their daughters.

Data will be kept confidential and no names will be included in the study. The gymnasts recruited will be between 11 and 21 years old. Participation in the study will take between 15 and 30 minutes and will require participants to fill out questionnaires.

If you are willing to participate, by allowing me to recruit mother and daughter volunteers to serve as research participants, please respond to this email and grant me permission to use your facilities to recruit mother-daughter dyads as research participants.

Also, if you have a parent club at your facility, please let me know if you would be willing to allow me to speak to the parents prior to the beginning of the study as part of my recruitment and consent process.

I greatly appreciate your help in this process. Thank you.
Re: NIU Master's Thesis

Edmar Nicolas <edmar@royaltygtd.com>
Mon 2/17/2020 12:22 PM
To: Madisyn Rozner <madisyn.rozner@outlook.com>

Madisyn,

Yes, I consent to this study.

Edmar Nicolas
Head girls and boys gymnastics coach
& co owner of Royalty Gymnastics, Tumble & Dance

Sent from my iPhone

On Feb 17, 2020, at 11:30 AM, Madisyn Rozner <madisyn.rozner@outlook.com> wrote:

Hi Edmar,

My name is Madisyn Rozner and I'm a graduate student and dietetic intern at Northern Illinois University. I am working on my master's thesis and I am seeking your permission to allow gymnasts and parents at your facility to participate in a research study I am conducting for my thesis to fulfill the requirements of my master's degree. All participation would be voluntary.

The purpose of the study is to increase understanding of the influence of mothers' eating attitudes and behaviors on their daughters. The study also aims to increase understanding of the relationship between social interactions regarding weight and eating attitudes and behaviors in this population of aesthetic, adolescent, non-elite, competitive gymnasts. Research shows that mothers influence daughters' eating attitudes and behaviors, and this influence can be both negative and positive. This study aims to create a better understanding of factors related to adolescent gymnasts' health, so that future wellness and prevention programs can be more effective and can take into account the power that mothers have in working to promote overall well-being in their daughters.

Data will be kept confidential and no names will be included in the study. The gymnasts recruited will be between 11 and 21 years old. Participation in the study will take between 15 and 30 minutes and will require participants to fill out questionnaires.

If you are willing to participate, by allowing me to recruit mother and daughter volunteers to serve as research participants, please respond to this email and grant me permission to use your facility to recruit mother-daughter dyads as research participants.
APPENDIX B

RESEARCH TIMELINE
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APPENDIX C

IBR APPROVAL LETTER
Approval Notice
Initial Review

02-Oct-2019

TO: Madisyn Rozner (01729224)
   Campus Dining Services

RE: Protocol # HS20-0094 “Influence of maternal eating attitudes, behaviors, and fat talk on adolescent, non-elite, competitive level gymnasts”

Your Initial Review submission was reviewed and approved under Member Review procedures by the Institutional Review Board on 02-Oct-2019. Please note the following information about your approved research protocol:


If your project will continue beyond that date, or if you intend to make modifications to the study, you will need additional approval and should contact the Office of Research Compliance and Integrity for assistance. Continuing review of the project, conducted at least annually, will be necessary until you no longer retain any identifiers that could link the subjects to the data collected. Please remember to use your protocol number (HS20-0094) on any documents or correspondence with the IRB concerning your research protocol.

Please note that the IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Unless you have been approved for a waiver of the written signature of informed consent, this notice includes a date-stamped copy of the approved consent form for your use. NIU policy requires that informed consent documents given to subjects participating in non-exempt research bear the approval stamp of the NIU IRB. This stamped document is the only consent form that may be photocopied for distribution to study participants.

It is important for you to note that as a research investigator involved with human subjects, you are responsible for ensuring that this project has current IRB approval at all times, and for retaining the signed consent forms obtained from your subjects for a minimum of three years after the study is concluded. If consent for the study is being given by proxy (guardian, etc.), it is your responsibility to document the
authority of that person to consent for the subject. Also, the committee recommends that you include an acknowledgment by the subject, or the subject's representative, that he or she has received a copy of the consent form. In addition, you are required to promptly report to the IRB any injuries or other unanticipated problems or risks to subjects and others. The IRB extends best wishes for success in your research endeavors.
APPENDIX D

CONSENT/ASSENT LETTERS
CONSENT/ASSENT TO PARTICIPATE IN A RESEARCH STUDY

Key Information
- This is a voluntary research study on eating attitudes, eating behaviors, and social interactions regarding weight in adolescent gymnasts and their mothers.
- This 15 to 30 minute study involves filling out the consent form and two questionnaires.
- The benefits include learning about your eating attitudes and behaviors, helping provide a better understanding of the eating attitudes of adolescent gymnasts that may benefit future wellness and prevention programs, and a chance to win a $50 Amazon gift card; the risks include potential discomfort from providing information on eating attitudes and behaviors.

My name is Madisyn Rozner and I’m a graduate student and dietetic intern at Northern Illinois University. I am working on my master’s thesis and I am seeking your consent and your daughter’s assent to participate in a research study I am conducting for my thesis to fulfill the requirements of my master’s degree. All participation would be voluntary.

The purpose of the study is to increase understanding of the influence of mothers’ eating attitudes and behaviors on their daughters. The study also aims to increase understanding of the relationship between social interactions regarding weight and eating attitudes and behaviors in this population of aesthetic, adolescent, non-elite, competitive gymnasts. Research shows that mothers influence daughters’ eating attitudes and behaviors, and this influence can be both negative and positive. This study aims to create a better understanding of factors related to adolescent gymnasts’ health, so that future wellness and prevention programs can be more effective and can take into account the power that mothers have in working to promote overall well-being in their daughters.

Data will be kept confidential and no names will be included in the study. The gymnasts recruited will be between 11 and 21 years old. Participation in the study will take between 15 and 30 minutes and will require participants to fill out questionnaires.

If you agree to participate, please send back this form, as well as the questionnaires in this envelope. Your daughter will fill out questionnaires during practice if your consent and questionnaires have been mailed back to Miss Rozner by ____________________.

In this form, “you” refers to your daughter as well as yourself.

Procedure:
If you decide to be a part of the study, you will be asked to;
- Complete a demographic questionnaire
- Answer questions regarding your eating attitudes and behaviors
- Complete a questionnaire about your social interactions regarding weight
Possible Risks
The only anticipated risk associated with this study is the possible discomfort from providing information on eating attitudes and behaviors.

Benefits:
By participating in this study, you may learn about your eating attitudes and behaviors. Additionally, your help in this study will provide a better understanding of the eating attitudes of adolescent gymnasts as well as benefit future wellness and prevention programs. There is no cost to you in the study. If all forms are received by Miss Rozner, you will be entered in a raffle to win a $50 Amazon gift card.

Right to withdraw from the study:
Your participation in the study is voluntary and you have the right to withdraw from the study at any time.

Confidentiality:
To protect your privacy, all information gathered from you will be kept confidential. Your information will be identified by a personal identification number (PIN) which will be assigned to you by the researcher. No one, except Miss Rozner, will know the name associated with your number. The data collected in this research will not be shared with anyone not directly related to the study unless required by law. The results will be presented as a group in all publications and at the general forum and conferences. Your information collected as a part of this research will not be used or distributed for future research, even if all identifiers are removed.

If you would like to know more about the research, you can contact Miss Madisyn Rozner at (312) 636-5345. If you feel you were mistreated or you have questions about being in the study you may contact MJ Blaschak, the Chairperson of the Northern Illinois University Institutional Review Board, at (815) 753-1438 or mblaschak@niu.edu.

If you have had all your questions answered to your liking and you would like to be in the study sign below.

______________________________  ______________________
Signature of Mother            Date

If you have had all your questions answered to your liking and you would like your gymnast ________________ to be in the study, sign below.

(Print Child’s Name)

______________________________  ______________________
Signature of Parent            Date

______________________________  ______________________
Signature of Gymnast            Date

Northern Illinois University

10/2/2019
Approved by NIU IRB
Void one year from above date
CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Key Information
- This is a voluntary research study on eating attitudes, eating behaviors, and social interactions regarding weight in adolescent gymnasts and their mothers.
- This 15 to 30 minute study involves filling out the consent form and two questionnaires.
- The benefits include learning about your eating attitudes and behaviors, helping provide a better understanding of the eating attitudes of adolescent gymnasts that may benefit future wellness and prevention programs, and a chance to win a $50 Amazon gift card; the risks include potential discomfort from providing information on eating attitudes and behaviors.

My name is Madisyn Rozner and I’m a graduate student and dietetic intern at Northern Illinois University. I am working on my master’s thesis and I am seeking your consent to participate in a research study I am conducting for my thesis to fulfill the requirements of my master’s degree. All participation would be voluntary.

The purpose of the study is to increase understanding of the influence of mothers’ eating attitudes and behaviors on their daughters. The study also aims to increase understanding of the relationship between social interactions regarding weight and eating attitudes and behaviors in this population of aesthetic, adolescent, non-elite, competitive gymnasts. Research shows that mothers influence daughters’ eating attitudes and behaviors, and this influence can be both negative and positive. This study aims to create a better understanding of factors related to adolescent gymnasts’ health, so that future wellness and prevention programs can be more effective and can take into account the power that mothers have in working to promote overall well-being in their daughters.

Data will be kept confidential and no names will be included in the study. The gymnasts recruited will be between 11 and 21 years old. Participation in the study will take between 15 and 30 minutes and will require participants to fill out questionnaires.

If you agree to participate, please send back this form, as well as the questionnaires in this envelope. Your daughter will be asked for her consent and to fill out questionnaires if your consent and questionnaires have been mailed back to Miss Rozner by ________________________.

Procedure:
If you decide to be a part of the study, you will be asked to;
- Complete a demographic questionnaire
- Answer questions regarding your eating attitudes and behaviors
Complete a questionnaire about your social interactions regarding weight

Possible Risks
The only anticipated risk associated with this study is the possible discomfort from providing information on eating attitudes and behaviors.

Benefits:
By participating in this study, you may learn about your eating attitudes and behaviors. Additionally, your help in this study will provide a better understanding of the eating attitudes of adolescent gymnasts as well as benefit future wellness and prevention programs. There is no cost to you in the study. If all forms are received by Miss Rozner, you will be entered in a raffle to win a $50 Amazon gift card.

Right to withdraw from the study:
Your participation in the study is voluntary and you have the right to withdraw from the study at any time.

Confidentiality:
To protect your privacy, all information gathered from you will be kept confidential. Your information will be identified by a personal identification number (PIN) which will be assigned to you by the researcher. No one, except Miss Rozner, will know the name associated with your number. The data collected in this research will not be shared with anyone not directly related to the study unless required by law. The results will be presented as a group in all publications and at the general forum and conferences. Your information collected as a part of this research will not be used or distributed for future research, even if all identifiers are removed.

If you would like to know more about the research, you can contact Miss Madisyn Rozner at (312) 636-5345. If you feel you were mistreated or you have questions about being in the study you may contact MJ Blaschak, the Chairperson of the Northern Illinois University Institutional Review Board, at (815) 753-1438 or mblaschak@niu.edu.

If you have had all your questions answered to your liking and you would like to be in the study sign below.

Signature of Mother ___________________ Date ___________________

Northern Illinois University
10/2/2019
Approved by NIU IRB
Void one year from above date
CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Key Information
- This is a voluntary research study on eating attitudes, eating behaviors, and social interactions regarding weight in adolescent gymnasts and their mothers.
- This 15 to 30 minute study involves filling out the consent form and two questionnaires.
- The benefits include learning about your eating attitudes and behaviors, helping provide a better understanding of the eating attitudes of adolescent gymnasts that may benefit future wellness and prevention programs; the risks include potential discomfort from providing information on eating attitudes and behaviors.

My name is Madisyn Rozner and I’m a graduate student and dietetic intern at Northern Illinois University. I am working on my master’s thesis and I am seeking your consent to participate in a research study I am conducting for my thesis to fulfill the requirements of my master’s degree. All participation would be voluntary.

The purpose of the study is to increase understanding of the influence of mothers’ eating attitudes and behaviors on their daughters. The study also aims to increase understanding of the relationship between social interactions regarding weight and eating attitudes and behaviors in this population of aesthetic, adolescent, non-elite, competitive gymnasts. Research shows that mothers influence daughters’ eating attitudes and behaviors, and this influence can be both negative and positive. This study aims to create a better understanding of factors related to adolescent gymnasts’ health, so that future wellness and prevention programs can be more effective and can take into account the power that mothers have in working to promote overall well-being in their daughters.

Data will be kept confidential and no names will be included in the study. The gymnasts recruited will be between 11 and 21 years old. Participation in the study will take between 15 and 30 minutes and will require participants to fill out questionnaires.

Procedure:
If you decide to be a part of the study, you will be asked to;
- Complete a demographic questionnaire
- Answer questions regarding your eating attitudes and behaviors
- Complete a questionnaire about your social interactions regarding weight

Possible Risks
The only anticipated risk associated with this study is the possible discomfort from providing information on eating attitudes and behaviors.
Benefits:
By participating in this study, you may learn about your eating attitudes and behaviors. Additionally, your help in this study will provide a better understanding of the eating attitudes of adolescent gymnasts as well as benefit future wellness and prevention programs. There is no cost to you in the study.

Right to withdraw from the study:
Your participation in the study is voluntary and you have the right to withdraw from the study at any time.

Confidentiality:
To protect your privacy, all information gathered from you will be kept confidential. Your information will be identified by a personal identification number (PIN) which will be assigned to you by the researcher. No one, except Miss Rozner, will know the name associated with your number. The data collected in this research will not be shared with anyone not directly related to the study unless required by law. The results will be presented as a group in all publications and at the general forum and conferences. Your information collected as a part of this research will not be used or distributed for future research, even if all identifiers are removed.

If you would like to know more about the research, you can contact Miss Madisyn Rozner at (312) 636-5345. If you feel you were mistreated or you have questions about being in the study you may contact MJ Blaschak, the Chairperson of the Northern Illinois University Institutional Review Board, at (815) 753-1438 or mblaschak@niu.edu.

If you have had all your questions answered to your liking and you would like to be in the study sign below.

_________________________________________     _______________________
Signature of Gymnast                                                                 Date

Northern Illinois University
10/2/2019
Approved by NIU IRB
Void one year from above date
APPENDIX E

BUDGET
<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentives for participation of mothers</td>
<td>$200</td>
</tr>
<tr>
<td>Postage for mothers’ envelopes</td>
<td>$110</td>
</tr>
<tr>
<td>Envelopes</td>
<td>$20</td>
</tr>
<tr>
<td>Labels for envelopes</td>
<td>$15</td>
</tr>
<tr>
<td>Ink</td>
<td>$30</td>
</tr>
<tr>
<td>Printing of assent/consent and questionnaires</td>
<td>$80</td>
</tr>
<tr>
<td>Travel cost to collect data</td>
<td>$978.46</td>
</tr>
<tr>
<td>(1687 miles x $0.58 per mile)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1433.46</strong></td>
</tr>
</tbody>
</table>
APPENDIX F

ORIGINAL EAT-26
Re: Request for Instruments to Use in Masters Thesis

David Garner <garner@river-centre.org>
Wed 10/3/2018 6:43 PM

To: Madisyn Rozner <mrozner2@niu.edu>;

Hello Ms. Rozner,

You are welcome to use the EAT-26 for your thesis as long as it is cited correctly and you can obtain specific permission information by going to the EAT-26.com website. The EDI-3 copyright is through Psychological Assessment Resources in Odessa Florida. I do not have Vicki Mark's contact information because I am out of the office but if you call PAR and ask for, she should be able to help you.

Best wishes.

Sent David Garner's iPhone

On Oct 3, 2018, at 11:12 AM, Madisyn Rozner <mrozner2@niu.edu> wrote:

Hello Dr. Garner,

My name is Madisyn Rozner and I am a graduate student at Northern Illinois University. I am studying to become a Registered Dietitian. I am working on a thesis regarding parental eating attitudes and behaviors in comparison to their daughters’ risk for an eating disorder. I would like to do this in a population of adolescent gymnasts because of the risk associated with gymnastics. The EAT and the EDI seem as though they would suit the parent attitudes portion of my study. I was hoping to cite and use the instruments to aid in the development and data collection of my study. Would it be possible for me to have access to and use your psychometric instruments?

Thank you,

Madisyn Rozner
Graduate Assistant
mrozner2@niu.edu
Permission to reproduce eat26

Eat-26 Auto Responder <donotreply@eat-26.com>
Thu 10/4/2018 10:22 AM
To: Madisyn Rozner <mrozner2@niu.edu>

Hello,

Thank you for your request for permission to reproduce and use the EAT-26. The EAT-26 is protected under copyright; however, all fees and royalties have been waived because it has been our wish for others to have free access to the test.

Please consider this e-mail as granting you permission to reproduce the test for the purpose suggested in your request if the EAT-26 is cited properly. The correct citation is: “The EAT-26 has been reproduced with permission. Garner et al. (1982). The Eating Attitudes Test: Psychometric features and clinical correlates. Psychological Medicine, 12, 871-878.”

You can download a copy of the scoring instructions and the test on the homepage of the EAT-26 website. If you use the written version of the test, it is recommended that you provide respondents with the link to the EAT-26 website (www.eat-26.com) so that they can learn more about the test.

Again, thank you for requesting permission to reproduce and use the EAT-26. If you intend on publishing your work, please send me your results so that they can be included in a research database being developed on the EAT-26 website (www.eat-26.com).

Best wishes,

David M. Garner, Ph.D.
EAT Copyright Holder
President & CEO
River Centre Clinic
**Eating Attitudes Test (EAT-26)**

Instructions: This is a screening measure to help you determine whether you might have an eating disorder that needs professional attention. This screening measure is not designed to make a diagnosis of an eating disorder or take the place of a professional consultation. Please fill out the below form as accurately, honestly and completely as possible. There are no right or wrong answers. All of your responses are confidential.

**Part A: Complete the following questions:**

1. **Birth Date**
2. **Month:**
3. **Day:**
4. **Year:**
5. **Gender:**
6. **Male**
7. **Female**

**Part B: Check a response for each of the following statements:**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Always</th>
<th>Usually</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Am terrified about being overweight.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Avoid eating when I am hungry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Find myself preoccupied with food.</td>
<td></td>
<td></td>
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<tr>
<td>4. Have gone on eating binges where I feel that I may not be able to stop.</td>
<td></td>
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<tr>
<td>5. Cut my food into small pieces.</td>
<td></td>
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<tr>
<td>6. Aware of the calorie content of foods that I eat.</td>
<td></td>
<td></td>
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<tr>
<td>7. Particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.).</td>
<td></td>
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<tr>
<td>8. Feel that others would prefer if I ate more.</td>
<td></td>
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<tr>
<td>9. Vomit after I have eaten.</td>
<td></td>
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<tr>
<td>10. Feel extremely guilty after eating.</td>
<td></td>
<td></td>
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<tr>
<td>11. Am preoccupied with a desire to be thinner.</td>
<td></td>
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<tr>
<td>12. Think about burning up calories when I exercise.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Other people think that I am too thin.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14. Am preoccupied with the thought of having fat on my body.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>15. Take longer than others to eat my meals.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>16. Avoid foods with sugar in them.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>17. Eat diet foods.</td>
<td></td>
<td></td>
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<tr>
<td>18. Feel that food controls my life.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>19. Display self-control around food.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>20. Feel that others pressure me to eat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Give too much time and thought to food.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Feel uncomfortable after eating sweets.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>23. Engage in dieting behavior.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>24. Like my stomach to be empty.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Have the impulse to vomit after meals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part C: Behavioral Questions:**

**In the past 6 months have you:**

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Once a month or less</th>
<th>2-3 times a month</th>
<th>Once a week</th>
<th>2-6 times a week</th>
<th>Once a day or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Gone on eating binges where you feel that you may not be able to stop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Ever made yourself sick (vomited) to control your weight or shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Ever used laxatives, diet pills or diuretics (water pills) to control your weight or shape?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D Exercised more than 60 minutes a day to lose or to control your weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Lost 20 pounds or more in the past 6 months</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

*Defined as eating much more than most people would under the same circumstances and feeling that eating is out of control.*

Copyright: EAT-26: (Garner et al. 1982, *Psychological Medicine, 12*, 871-878); adapted by D. Garner with permission.
APPENDIX G

ORIGINAL FAMILY FAT TALK QUESTIONNAIRE
RE: Family Fat Talk Questionnaire

MacDonald, Danielle <Danielle.MacDonald@uhn.ca>
Thu 5/30/2019 2:08 PM
To: Madisyn Rozner <Z1729224@students.niu.edu>

1 attachments (419 KB)
2015 - MacDonald - FFTQ.pdf;

Hi Madisyn,

Absolutely. The FFTQ is in the public domain (i.e., it's available in the published article) so feel free to use it in your thesis as long as you cite it appropriately. The information you will need to format the questionnaire items for your purposes is all in the article (which I've attached for you). To help you do so, here are the main points of what you will need to set it up, and where you will find them in the article:

-Pg 45, right side, you will see the instructions that should appear at the top of the page (before the items): “We are interested in the comments you say out loud when you are with your family members over the last year. We are also interested in the comments your family members made about their bodies over the last year. We define family broadly to include parents, siblings, partners, etc. Please keep this in mind when filling out the following questions.”

-The final 16 FFTQ items are listed in Table 1 (pg 46).

-Page 45, right side, you will see that the items are scored on a 5-point Likert Scale, ranging from never to always. The article doesn’t elaborate the response scale explicitly, but the responses options and their scores are:
  Never (1), Rarely (2), Sometimes (3), Often (4), and Always (5)

-Pg 48, top right: you can also see that respondents were asked to indicate which family members they were thinking of when they completed the FFTQ, and could endorse as many as they wished. The exact text for this, which occurred after the FFTQ items, was:
  “While responding to the above questionnaire, please indicate which family members you were referring to.”

And they were given the options: mother(s), father(s), brother(s), sister(s), partner(s), child(ren)

-Finally, the scoring instructions are listed on Pg 46, right hand side. You can see that there are 2 subscales, and the subscale scores are the totals of the item scores. Table 1 shows which items load onto which subscales (Factor 1 = “family” subscale and Factor 2 = “self” subscale).

I hope that helps. Take a look at the article and let me know if you have any questions. Good luck with your thesis! It sounds like an interesting idea.
Danielle

Danielle MacDonald, PhD, C.Psych.
APPENDIX H

RESOURCES SENT TO GYM OWNERS
The benefits of sport are well recognized: organized athletics builds self-esteem, promotes physical conditioning, enhances skills, teaches the value of teamwork, and sets a foundation for lifelong physical activity. Athletic competition, however, can also cause severe psychological and physical stress that is amplified in individuals struggling with anxiety, depression, and perfectionism. When the pressures of sport competition are added to cultural ideals that emphasize a certain body type, the risks increase for athletes to develop disordered eating (irregularities in eating patterns and behaviors that may or may not develop into an eating disorder). Be mindful of your messaging, your athletes’ behaviors, and keep the following tips in mind.

COACH & ATHLETIC TRAINER TOOLKIT

The Coach & Athletic Trainer Toolkit is a resource for staff who work in gyms, school settings, outside athletic groups, dance studios, etc. who would like to know how to support athletes who may be affected by eating disorders. We’ve included frequently asked questions and common myths about eating disorders, strategies for assisting athletes and much more!

Download Coach & Trainer Toolkit

TIPS FOR COACHES: PREVENTING EATING DISORDERS IN ATHLETES

1. Take a proactive approach, be vigilant, and have an understanding of eating disorders.
1. Take warning signs and eating disordered behaviors seriously! Cardiac arrest and suicide are the leading causes of death for people with eating disorders.

2. If an athlete is chronically dieting or exhibits mildly abnormal eating, refer her or him to a health professional with eating disorder expertise. Early detection increases the likelihood of successful treatment; left untreated the problem may progress to an eating disorder.

3. De-emphasize weight by not weighing athletes and eliminate comments about weight. Instead, focus on other areas in which athletes can improve performance. For example, focus on strength and physical conditioning, as well as the mental and emotional components of performance.

4. Don’t assume that reducing body fat or weight will enhance performance. While it may lead to improved performance, studies show this does not apply to all athletes. It is not uncommon for individuals attempting to lose weight to develop eating-disorder symptoms, which can physically weaken the athlete. Performance should not be at the expense of the athlete’s health.

5. Instruct coaches and trainers to recognize signs and symptoms of eating disorders, (weight loss, fatigue, over-training, refusal to eat with the team, frequent injuries, etc.) and understand their role in prevention. Eating-disordered individuals often hide their symptoms out of shame and embarrassment.

6. Provide athletes with accurate information regarding weight, weight loss, body composition, nutrition, and sports performance to reduce misinformation and to challenge unhealthy practices.

7. Emphasize the health risks of low weight, like low bone density, lowering of immunity and auto-immune illnesses. The athlete should be referred for medical assessments in these cases. [Learn more about health consequences](#)

8. Understand why weight is such a sensitive and personal issue. Eliminate derogatory comments or behaviors about weight—no matter how slight. Celebrate the athlete for talents and strengths beyond the physical; work on developing body, mind and spirit. If there is concern about an athlete’s weight, the athlete should be referred for an assessment to a professional skilled in diagnosing and treating eating disorders.

9. Do not automatically curtail athletic participation if an athlete is found to have eating problems, unless warranted by a medical condition. Consider the athlete’s health, physical and emotional safety, and self-image when making decisions regarding an athlete’s level of participation in his/her sport.

10. It is essential for coaches and trainers to explore their own values and attitudes regarding weight, dieting, and body image, and how their values and attitudes may inadvertently affect their athletes. They should understand their role in promoting a positive self-image and self-esteem in their athletes. Remember, if athletes do not take care of their bodies, they risk losing their athletic careers at a very young age. [Learn more about eating disorders and athletes](#)
LEARN ABOUT EATING DISORDERS

If your loved one is struggling with food and/or body image issues, they may have some of these characteristics. The term “eating disorder” typically refers to one (or more) of the following:

- **Anorexia Nervosa (AN)** is characterized primarily by self-starvation and excessive weight loss.
- **Bulimia Nervosa (BN)** is characterized primarily by a cycle of binge eating followed by compensatory behaviors, such as self-induced vomiting, in an attempt to counteract the effects of binge eating.
- **Binge Eating Disorder (BED)** is characterized primarily by recurrent binge eating without the regular use of compensatory measures.
- **Other Specified Feeding or Eating Disorder (OSFED)** is a feeding or eating disorder that causes significant distress or impairment but does not meet the criteria for another feeding or eating disorder.

START A CONVERSATION

WHAT SHOULD I SAY?

If you are worried about someone’s eating behaviors or attitudes, then it is appropriate for you to express your concerns in a loving, supportive way. It is important to handle these issues with honesty and respect. It is also important to discuss your worries early on, rather than waiting until they have endured any of the damaging physical and emotional effects of eating disorders.

Because your loved one’s health, or even their life, may be in danger, it is important not to keep your concerns a secret for fear of making them angry or getting them in trouble. Other people in their life need to know so they can encourage them to acknowledge their problem and get help. If your friend is under 18, a trusted adult needs to know immediately.

In a calm and caring way, talk to your loved one about specific things you see or feel. Share your memories of two or three times when you felt concerned, afraid, or uneasy because of their eating or exercise rituals. Talk about the feelings you experienced as a result of these events.

It is best to focus on the specific signs and symptoms that have caused you to feel concerned, not the person’s weight or appearance. Try to do this in a very supportive, non-confrontational way.

Three suggestions to try:

1. **Use “I” statements.** “I’m concerned about you because you refuse to eat breakfast or lunch, I feel afraid when I hear you vomiting.”
2. **Avoid accusatory “You” statements.** “You have to eat something! You’re out of control!”
3. **Avoid giving simple solutions.** “If you’d just stop then everything would be fine.”

FIND HELP

Contact the Helpline to ask about these resources:
- How to Talk to a Loved One About Eating Concerns
- How To Help a Friend with Eating and Body Image Issues
- Parent Toolkit (Includes information for all levels of care)
- Treatment Options: www.nationaleatingdisorders.org/find-treatment

800-931-2237
nationaleatingdisorders.org/
helplineschat
info@nationaleatingdisorders.org
text NEDA to 741-741 for 24/7 crisis support
For 24/7 crisis support text:
**NEDA to 741-741**

Find resources and treatment options at:
**myneda.org/find-treatment**

Take a confidential screening at:
**myneda.org/screening**

National Eating Disorders Helpline:
**myneda.org/helpline-chat**
Disordered eating is when a person’s attitudes about food, weight, and body size lead to very rigid eating and exercise habits that jeopardize one’s health, happiness, and safety. It is never too early to ask for help about eating concerns. When you begin to notice that disordered eating habits are affecting your life, your happiness, and your ability to concentrate, it is important that you talk to somebody about what you’re going through. These behaviors can quickly get out of control and may even lead to an eating disorder, which can be a life-threatening problem.

If you are able to recognize disordered eating attitudes and behaviors in yourself, you have already taken the first step toward a happy, healthy, balanced way of life. The second step—telling a trusted friend, family member, or professional counselor/nutritionist—is equally as important.

You should not attempt to address your disordered eating alone; discussing the feelings you’re experiencing with a loved one can provide essential comfort, support, and direction. Starting that initial conversation may be challenging, but these guidelines were developed to help to make it a bit easier.

**ESTABLISH A SAFE ENVIRONMENT**

Identify someone whom you trust and feel comfortable talking to. Family and friends can be wonderful, supportive resources, but if you’re concerned about your eating behaviors, it is advisable to also speak with a professional counselor and/or nutritionist. Getting help from a professional who understands and specializes in eating, weight, and body image issues can feel less threatening and more objective because they are familiar with situations like your own.

Whether you decide to speak with a professional or a loved one (or both!), set aside a specific time with that person so you can discuss your situation. Try to find a private, comfortable place away from other people and distractions so that you can talk openly about your concerns and feelings.

Both before and during this conversation, it is normal for you to experience a range of feelings including fear, shame, anger, embarrassment, or nervousness. To keep up the courage to talk about what you’re going through, remember that you are doing the right thing. It is important to talk about this and ask for help. You should be proud of yourself for...
taking the first steps toward a healthy, well-balanced lifestyle!

**EXPLAIN THE SITUATION**

Explain the thoughts and feelings that you are experiencing and the behaviors you have developed, using details. Starting from the beginning, talk about how you began the disordered eating habits and why you have continued them. Although you may not be able to fully explain the reasons for your eating and exercise rituals, attempting to do so may help you recognize some of the connections you make between eating, exercise, and self-esteem.

It is important to keep in mind that the person you have confided in may not completely understand exactly how you are feeling or the reasons for your behavior. They may demonstrate shock, denial, fear, or even anger. Be patient and remain calm. Remember that they may not automatically know the best way to respond and support you, but you can help them learn.

Answering some or all of these questions before your meeting may help you frame what you’d like to share:

- When did you begin having different thoughts regarding food, weight, or exercise? What were the thoughts?
- When did the different behaviors start? What was the behavior? How were you feeling at the time? Did you hope to accomplish something specific (e.g., lose weight, maintain weight, gain control of something, get somebody’s attention, see what it was like) in doing this behavior?
- Have you noticed any physical health effects (e.g., fatigue, loss of hair, digestive problems, loss of menstrual cycle, heart palpitations)? Have you noticed any emotional effects?
- How are you currently feeling physically? Emotionally? Do you feel ready to stop the disordered eating behaviors?
- How can the people in your life best support you? Do you want them to monitor your behavior? Do you want them to ask you how you are doing with your recovery or would you rather tell them about it when you’re ready?
- What changes are you willing to make in your life to establish a healthy lifestyle?

**EDUCATE WITH THE FACTS**

Give the person you confide in some information regarding the prevalence of eating disorders and tips for how to best support somebody who is struggling with food, weight or body image issues. Share facts with them that include the physical and emotional effects of eating disorders, along with the steps involved in recovery.

Let this person know how they can help and what you need, and keep them informed as your needs change throughout your recovery process. Remind them that recovery is a gradual process—there may even be some setbacks—and you will require patience and
gradual process—there may even be some setbacks—and you will require patience and understanding along the way.

As you begin to address your eating concerns, keep in mind that regardless of the numbers on the scale or the size, shape, and curve of your body, you are a special and unique individual! Reaching out to the people who care for you and want to help you get better is the first step towards embracing recovery and developing a healthy relationship with food.

Contact the Helpline

Find Treatment Now
APPENDIX I

MODIFIED EAT-26
Eating Attitudes Test (EAT-26)

Instructions: This questionnaire assesses eating attitudes and behaviors. It is not designed to make any diagnoses. Please fill out the below form as accurately, honestly, and completely as possible. There are no right or wrong answers. All of your responses are confidential. Please fill out both sides.

Please circle a response to each of the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Always</th>
<th>Usually</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Am terrified about being overweight.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>7. Particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.)</td>
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<tr>
<td>8. Feel that others would prefer if I ate more.</td>
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<tr>
<td>9. Vomit after I have eaten.</td>
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<tr>
<td>10. Feel extremely guilty after eating.</td>
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<tr>
<td>11. Am preoccupied with a desire to be thinner.</td>
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<tr>
<td>12. Think about burning up calories when I exercise.</td>
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<tr>
<td>13. Other people think that I am too thin.</td>
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<tr>
<td>14. Am preoccupied with the thought of having fat on my body.</td>
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<tr>
<td>15. Take longer than others to eat my meals.</td>
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<tr>
<td>16. Avoid foods with sugar in them.</td>
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<tr>
<td>17. Eat diet foods.</td>
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<tr>
<td>18. Feel that food controls my life.</td>
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<tr>
<td>19. Display self-control around food.</td>
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<td>20. Feel that others pressure me to eat.</td>
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<tr>
<td>21. Give too much time and thought to food.</td>
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<tr>
<td>22. Feel uncomfortable after eating sweets.</td>
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<tr>
<td>23. Engage in dieting behavior.</td>
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<tr>
<td>24. Like my stomach to be empty.</td>
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<tr>
<td>25. Have the impulse to vomit after meals.</td>
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</tr>
</tbody>
</table>
In the past 6 months have you:

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once a month or less</th>
<th>2-3 times a month</th>
<th>Once a week</th>
<th>2-6 times a week</th>
<th>Once a day or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Gone on eating binges where you feel that you may not be able to stop? *</td>
<td>Never</td>
<td>Once a month or less</td>
<td>2-3 times a month</td>
<td>Once a week</td>
<td>2-6 times a week</td>
<td>Once a day or more</td>
</tr>
<tr>
<td>B. Ever made yourself sick (vomited) to control your weight or shape?</td>
<td>Never</td>
<td>Once a month or less</td>
<td>2-3 times a month</td>
<td>Once a week</td>
<td>2-6 times a week</td>
<td>Once a day or more</td>
</tr>
<tr>
<td>C. Ever used laxatives, diet pills or diuretics (water pills) to control your weight or shape?</td>
<td>Never</td>
<td>Once a month or less</td>
<td>2-3 times a month</td>
<td>Once a week</td>
<td>2-6 times a week</td>
<td>Once a day or more</td>
</tr>
<tr>
<td>D. Exercised more than 60 minutes per day to lose or control your weight?</td>
<td>Never</td>
<td>Once a month or less</td>
<td>2-3 times a month</td>
<td>Once a week</td>
<td>2-6 times a week</td>
<td>Once a day or more</td>
</tr>
<tr>
<td>E. Lost 20 pounds or more in the past 6 months</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Defined as eating much more than most people would under the same circumstances and feeling that eating is out of control
APPENDIX J

MODIFIED FAMILY FAT TALK QUESTIONNAIRE
Re: FFTQ Mother-Daughter Document

Chong Man Chow <cchow@emich.edu>
Mon 7/29/2019 1:36 PM
To: Madisyn Rozner <Z1729224@students.niu.edu>

Yes

===============================================
Chong Man Chow, Ph.D.
Associate Professor
Psychology Department
Eastern Michigan University
361A Science Complex
Ypsilanti, MI 48197
734-487-2037
ccchow@emich.edu
http://statsalpha.com/

On Jul 29, 2019, at 12:56 PM, Madisyn Rozner <Z1729224@students.niu.edu> wrote:

Thank you for example of the daughters’ questionnaires. Do I have permission to use your modified questionnaire?

Thank you,
Madisyn Rozner

From: Chong Man Chow <cchow@emich.edu>
Sent: Monday, July 29, 2019 9:03 AM
To: Madisyn Rozner <Z1729224@students.niu.edu>
Subject: Re: FFTQ Mother-Daughter Document

Below are the items:

Family Fat Talk Questionnaire (MacDonald et al., 2015)

Use the following items to indicate the frequency with which you engage in the following behaviors when you are with your parent.

1 = Never
2
3
4
5 = Always

When I’m with my parent…

1. I complain that my arms are too flabby.
2. I complain that my body is out of proportion.
3. I complain that I am fat.
4. I complain that I should not be eating fatty foods.
5. I complain that my clothes are too tight.
6. I criticize my body compared to others' bodies.
7. I complain that I feel pressure to be thin.
8. I complain that I'm not in shape.

9. She complains that her arms are too flabby.
10. She complains about the proportion of her body.
11. She complains that she is fat.
12. She complains that she should not be eating fatty foods.
13. She complains that her clothes are too tight.
14. She criticizes her body compared to others' bodies.
15. She complains that she feels pressure to be thin.
16. She complains that she is not in shape.

======================================
Chong Man Chow, Ph.D.
Associate Professor
Psychology Department
Eastern Michigan University
361A Science Complex
Ypsilanti, MI 48197
734-487-2037
ccchow@emich.edu
http://statsaloha.com/
**Instructions:** We are interested in the comments you say out loud when you are with your daughter (last 12 months). We are also interested in the comments your daughter made about her body over the last year. We define daughter as the gymnast that participates in competitive level gymnastics that you live with and take an active role in parenting. Please keep this in mind when filling out the following questions.

**Please circle a response to each of the following statements:**

<table>
<thead>
<tr>
<th>1. When I’m with my daughter, I complain that my arms are too flabby.</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. When I’m with my daughter, I complain that my body is out of proportion.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>3. When I’m with my daughter, I complain that I am fat.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>4. When I’m with my daughter, I complain that I should not be eating fattening foods.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>5. When I’m with my daughter, I complain that my clothes are too tight.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>6. When I’m with my daughter, I criticize my body compared to others’ bodies.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>7. When I’m with my daughter, I complain that I feel pressure to be thin.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>8. When I’m with my daughter, I complain that I’m not in shape.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>9. When I’m with my daughter, she complains that her arms are too flabby.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>10. When I’m with my daughter, she complains about the proportion of her body.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>11. When I’m with my daughter, she complains that she is fat.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>12. When I’m with my daughter, she complains that she should not be eating fattening foods.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>13. When I’m with my daughter, she complains that her clothes are too tight.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>14. When I’m with my daughter, she criticizes her body compared to others’ bodies.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>15. When I’m with my daughter, she complains that she feels pressure to be thin.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
<tr>
<td>16. When I’m with my daughter, she complains that she is not in shape.</td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
</tbody>
</table>
Instructions: We are interested in the comments you say out loud when you are with your mother (last 12 months). We are also interested in the comments your mother made about her body over the last year. We define mother as your mom or an adult female who acts as a mother figure that lives in your home. Please keep this in mind when filling out the following questions.

Please circle a response to each of the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When I’m with my mom, I complain that my arms are too flabby.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. When I’m with my mom, I complain that my body is out of proportion.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. When I’m with my mom, I complain that I am fat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. When I’m with my mom, I complain that I should not be eating fattening foods.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. When I’m with my mom, I complain that my clothes are too tight.</td>
<td></td>
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</tr>
<tr>
<td>6. When I’m with my mom, I criticize my body compared to others’ bodies.</td>
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<tr>
<td>7. When I’m with my mom, I complain that I feel pressure to be thin.</td>
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</tr>
<tr>
<td>8. When I’m with my mom, I complain that I’m not in shape.</td>
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<td></td>
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</tr>
<tr>
<td>9. When I’m with my mom, she complains that her arms are too flabby.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>10. When I’m with my mom, she complains about the proportion of her body.</td>
<td></td>
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<tr>
<td>11. When I’m with my mom, she complains that she is fat.</td>
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<tr>
<td>12. When I’m with my mom, she complains that she should not be eating fattening foods.</td>
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<tr>
<td>13. When I’m with my mom, she complains that her clothes are too tight.</td>
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<td></td>
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</tr>
<tr>
<td>14. When I’m with my mom, she criticizes her body compared to other bodies.</td>
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</tr>
<tr>
<td>15. When I’m with my mom, she complains that she feels pressure to be thin.</td>
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<tr>
<td>16. When I’m with my mom, she complains that she is not in shape.</td>
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APPENDIX K

DEMOGRAPHICS
Mother – Demographics

Age ______
Gender: Female ___ Male ___ Non-binary ___

Ethnicity:
Asian____ Black/African American____ Caucasian/White____ Hispanic/Latino____ Native American ____ Mixed Race____ Other___________

Do you live in the same home as your daughter who participates in gymnastics? Yes ____ No ____

If yes, please mark your relationship to your (gymnast) daughter:
Biological parent ___ Adoptive parent ___ Step-parent ___ Parent’s Partner (living together) ___ Foster parent___
Other (please define) _____________

How many days per week does your gymnast live with you? 1__ 2__ 3__ 4__ 5__ 6__ 7__ Other___

Daughter - Demographics

Age ______
Gender: Female ___ Male ___ Non-binary ___

Ethnicity:
Asian____ Black/African American____ Caucasian/White____ Hispanic/Latino____ Native American ____ Mixed Race____ Other___________

Competitive level of gymnastics: 1___ 2___ 3___ 4___ 5___ 6___ 7___ 8___ 9___ Gold___ Platinum___
Hours spent in the gym per week _______

Do you live with your mom or an adult female who acts as a mother figure? Yes ___ No ___

If yes, please mark your relationship to your mother or adult female who acts as a mother figure:
Biological child ___ Adopted child___ Step-child ___ Foster child___ Other (please define) _____________

How many days per week do you live with your mom or an adult female who acts as a mother figure? 1__ 2__ 3__ 4__ 5__ 6__ 7__ Other__________