

## **Network Centrality, Perfectionism and Eating Disorders Among Nutrition Majors**

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### **Abstract**

Disordered eating and body dissatisfaction are becoming increasingly prevalent on today's college campuses. Students surveyed at a university over the course of thirteen years revealed a 17.1% increase for men and 9.2% increase for women in eating disorder rates (White, 2011). Furthermore, those students who choose to pursue degrees in nutrition are at an additional risk of developing an eating disorder (Houston, 2008). Perhaps this is due to the fact that these students are hyper-aware of "correct" eating behaviors and thus attempt to meet the standards of their future profession. Substantial research supports the fact that increased levels of perfectionism are found in those with eating disorders such as anorexia nervosa and bulimia nervosa (Stairs, 2011). Moreover, in the college setting especially, peers greatly influence one another. Individuals who surround themselves with peers that place value on thinness are at a heightened risk for developing abnormal eating behaviors (Hutchinson, 2007). Nutrition students are surrounded by peers taking similar courses, which may create added pressure to attain thin ideals that reinforce abnormal eating patterns. This study aims to determine whether or not there is a relationship between perfectionism, disordered eating, and network centrality among a sample of nutrition majors. 99 undergraduate nutrition students at a midsized public university participated. They had an average age of 20.44 years. The vast majority reported being white/Caucasian (91.0%); in addition, students recorded came from middle to upper class backgrounds with 43.6% reporting an annual family income of \$100,000 or greater. The average GPA of the participants on a four-point scale was 3.38. The data were collected through a social network analysis, which provided a graphic representation of the relational connections between nutrition students' social circles.

**Keywords: Nutrition, Eating Disorders, Perfectionism**

### **1. Introduction**

There is significant research in the way of eating disorders on college campuses; surprisingly there is not substantial research on a rather obvious population, nutrition students. While the students' developing knowledge of nutrition may certainly contribute to positive eating behaviors, it may conversely create an unhealthy fixation on food thus reinforcing eating disorder tendencies. The nutrition student population has been found to have greater incidences of restrained eating in order to lose weight or prevent weight gain (Korinth, 2009). This behavior may be driven by the individual's desire to fulfill the thin ideal or comply with the "correct" eating standards that their future profession values. In addition to pressures from within their scope of study, social network as well as certain personality traits may influence college nutrition student's negative eating behaviors. This study aims to determine whether or not there is a relationship between perfectionism, disordered eating, and network centrality among a sample of nutrition majors. Perfectionism is defined as the tendency to set very high standards and to place importance on the achievement of those standards for self-evaluation (Frost, 1990). Those nutrition students who experience higher levels of perfectionism may find themselves obsessing over thin ideals and trying to attain the high standard of "correct" eating.

Among nutrition students, this could certainly pose an issue as higher levels of perfectionism are correlated with the development of eating disorders (Bardone-Cone, 2007).

In addition to nutritional studies and traits of perfectionism, peer groups may also influence whether or not an individual experiences an eating disorder. College is a time in which individuals are still developing and their eating behaviors can be greatly influenced by social environments, specifically peers (Story, 2002). Social network analysis has the ability to measure centrality, or, popularity within a network. The data collection in this study measured the indegree and outdegree of individuals in order to determine if prestige within the dietetic major was related to perfectionism and disordered eating behavior.

## 2. Methods

### 2.1 Participants

All of the participants were undergraduate students majoring in nutrition at a mid-sized Midwestern University. The nutrition branch is comprised of approximately 200 students, 99 participated in this study. The nutrition students had an average age of 20.44 (SD=1.52). The average GPA of the participants on a four point scale was 3.38/ 4.0 (SD=.36). Of the participants 91.9% were white (Caucasian).

Two educational tracks are offered to nutrition majors: Community Nutrition and Dietetics Nutrition. Of those who participated in this study, 19.0% were enrolled in the Community Nutrition track and 73.7% were pursuing the dietetics track, allowing them to earn their Didactic Program in Dietetics Verification Statement and meet the requirements to become a registered dietitian.

### 2.2 Procedures

The data for this project was collected using Qualtrics, an online survey tool. The data was collected in two phases. During the first phase the data was collected in a computer lab. Then, during the second phase of data collection a survey was emailed to all of the nutrition majors using a list serve, in order to increase enrollment. The nutrition students were compensated with \$10 for completing the survey.

### 2.3 Measures

#### 2.3.1 *eating pathology symptom inventory (EPSI):*

The EPSI is an eight-factor scale consisting of 45 self-reported items that evaluate the eating pathology of an individual. Subscales of the EPSI include: Body Dissatisfaction, Bing Eating, Cognitive restraint, Purging, Restricting, Excessive Exercise, Negative Attitudes towards Obesity, and Muscle Building. The participants rated their responses on a scale of (0=never, 1=rarely, 2=sometimes, 3=often, 4=very often).

#### 2.3.2 *m-cups:*

The M-Cup scale is used to evaluate the personality traits associated with perfectionism. The subscales of M-Cups consist of: High Standards, Perceived Pressure from Others and Reactivity to Mistakes. The participants were asked to rank their feelings on a Likert Scale (1= strongly disagree, 5= strongly agree).

### 2.4. Social Network Analysis:

Each participant was given the following prompt: “please indicate which of the following members of the nutrition major you consider to be your friends (check as many as apply). Friends, defined as someone who you spend most of your time with or seek advice from in the major.” After the prompt, the participants were given a list of names of all of the nutrition students in the major at their university.

### 3. Results

The current study examined the relationship between perfectionism, disordered eating, and network centrality among a sample of nutrition majors. Perfectionism was measured by the MCUP and has three aspects – perceived pressure, reactivity to mistakes, and high standards. See table 1 for means and standard deviations. Disordered eating was measured by the EPSI and has seven subscales: body dissatisfaction, binge eating, cognitive restraint, purging, restriction, excessive exercise, and negative attitudes towards obesity. See table 2 for means and standard deviations. Network centrality was measured by indegree (number of people who selected them as friends or a measure of popularity) and outdegree (number of people they selected as friends or a measure of prestige).

Table 1. MCUP

<b>MCUP Subscales</b>	<b>Mean</b>	<b>SD</b>
Perceived Pressure	18.67	5.64
Reactivity to Mistakes	21.84	6.92
High Standards	25.75	4.25

Table 2. EPSI

<b>EPSI Subscales</b>	<b>Mean</b>	<b>SD</b>
Body Dissatisfaction	12.36	5.86
Binge Eating	10.13	4.73
Cognitive Restraint	6.79	2.27
Purging	1.47	2.60
Restriction	5.51	3.76
Excessive Exercise	9.44	4.49
Negative Attitudes towards Obesity	6.82	4.35

Figure 1 presents the network. The blue boxes represent the nodes or students. The black lines are directional. If a person or node (node A) indicated that they were friends with another person or node (node B), an arrow from node A would point to node B. The numbers were assigned to each participant to protect the identities of the students. People or nodes with more arrows or ties are considered to be more central to the network. People or nodes with fewer ties or arrows are considered to be less central or connected in the network. There are 200 nutrition majors and 99 completed the study thereby providing information on approximately 50% of the network.

Several characteristics describe the connectivity between participants in the network. For example, density is the total number of ties or arrows divided by the total number of ties possible. In large network, this number is expected to be low because it is highly unlikely that everyone in the network will know everyone else. Another characteristic in the network is the number of triplets or transitivity. In other words, if there are three nodes or people, what is the proportion of these combinations that are completely connected. Transitivity is another measure of how connected the network is.

The average number of ties is 2.43 for indegree and 5.80 for outdegree. This indicates that the participants nominated approximately 6 people as friends but only approximately 2 people returned the friend nomination.

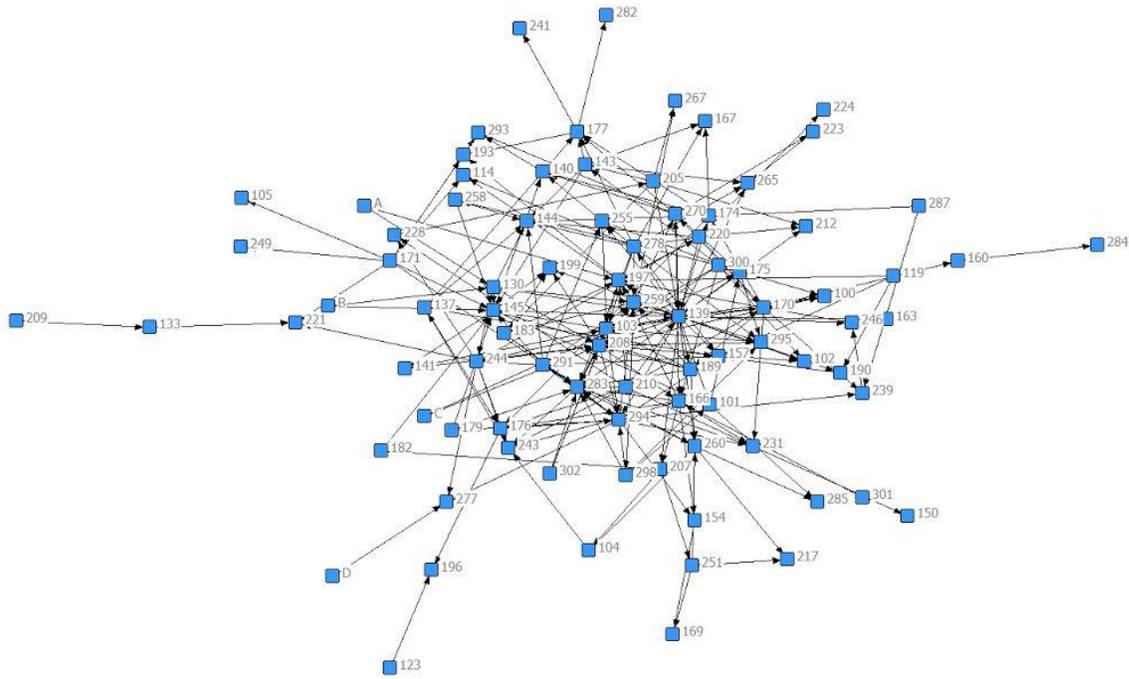


Figure 1. Nutrition Student Social Network

To further extend the research, we examined the relationship between perfectionism, centrality, and disorder eating. It was hypothesized that one's position in the network of nutrition majors would be related to one's level of disordered eating, and level of perfectionism. Previous research indicated that perfectionism is related to disordered eating. To test this hypothesis, we used structural equation modeling.

Mplus version 7.2 (Muthen & Muthen, 1998–2015) and maximum likelihood estimation was used to examine the relationship between perfectionism, disordered eating, and network centrality. In contrast to univariate statistics, multiple criteria are utilized to assess the fit of a structural model (i.e., hypothesis) to the data. The model was examined using the following criteria: (1) theoretical relevance or being informed by previous research, (2) global fit indices (i.e., chi-square, Comparative Fit Index, & Tucker-Lewis Index), (3) microfit indices (i.e., parameter estimates and Root Mean Squared Error of Approximation), and (4) parsimony.

According to Browne and Cudeck (1992), a RMSEA with a fit of less than .05 indicates a well-fitting model. For global fit indices, a non-significant chi-square suggests the data does not significantly differ from the hypotheses represented by the model; for CFI and TLI, fit indices of above .90 (preferably above .95) are utilized to indicate a well-fitting model (Hu & Bentler, 1999).

Bivariate correlations indicated a statistically significant relationship among variables. Based on the research and the bivariate correlations, a structural equation model was proposed using centrality as measured by indegree and outdegree, perfectionism as measured by MCUP, and disordered eating as measured by EPSI (see Figure 2). Analysis revealed a model fit of,  $\chi^2(n = 101, 55) = 110.26$ , CFI = .91, TLI = .87, RMSEA = .10. See Figure 2 for parameter estimates. The global fit of the model was mixed. However, the parameter estimates were significant and positive with the exception of indegree on the latent construct of centrality. Therefore, as disordered eating increases so does the participants' level of perfectionism and centrality. Given that outdegree was the primary indicator of centrality, it seems that prestige or the number of friends they selected in their major was linked to their disordered eating level and perfectionism level.

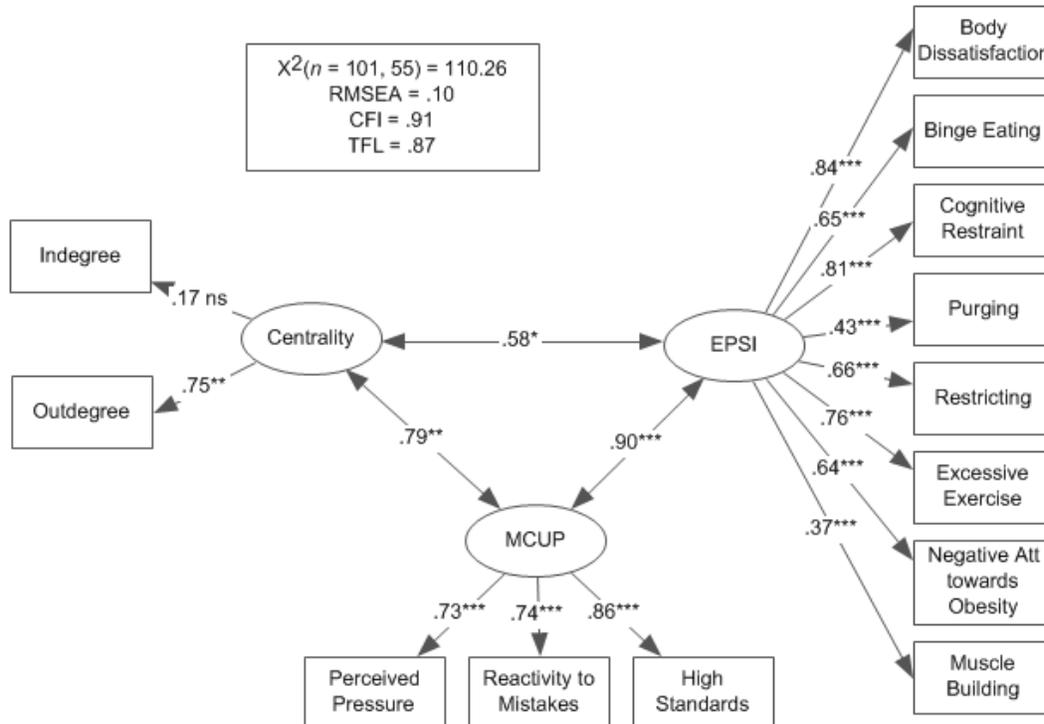


Figure 2. Structural Equation Model (MCUP, EPSI, network centrality)

#### 4. Discussion

Although the literature confirms the relationship between levels of perfectionism and disordered eating, little has been done in the way of examining the impact of network centrality and its relation to perfectionism and disordered eating. The results of this study indicate that while disordered eating is not a predictor of level of perfectionism or network centrality, a significant relationship exists amongst the three. Thus confirming the hypothesis that one's position in the network of nutrition majors would be related to one's level of disordered eating, and level of perfectionism. No study is without limitations; the present study was ethnically homogenous with 91.0% being Caucasian/white. Additionally, only 99 of the 200 nutrition students participated in this study. This study complements the current literature and is unique in that it accounts for not only level of perfectionism and disordered eating but centrality within a social network as well. Future research may consider studying a more ethnically diverse population. Additionally further studies should extend the population to other university's nutrition majors to confirm whether or not this issue is consistent throughout.

#### 5. References

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