

# Gender identity and bulimic eating behavior.

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Historically, during periods of uncertain food supply, consuming large quantities of food and subsequent purging was an expression of social superiority; in contrast, modern society interprets bulimic eating as an expression of self-control deficits (Mennel & Simons, 1989). The recent rise of bulimia in highly developed countries has received a great deal of attention in the scientific community since Hilde Bruch first described so-called "thin-fat people" in 1973. Clinicians began observing an increasing number of normal-weight individuals exhibiting an eating pattern characterized by periodic episodes of binge eating alternating with periods of dieting and purging via vomiting, diuretics, or laxatives.

At this time, if one had to predict a person's risk of developing bulimia on the basis of a single attribute, the best choice would be anatomical sex. (3) In general, 90% of all identified bulimics are women. (Halmi, Falk, & Schwartz, 1981). While quite common among females, bulimia is seldom identified in males. Estimates suggest that 4-10% of high school and college women have serious problems with bulimia; by contrast, 0-0.4% of college men are affected (Pyle, 1985; Smith, 1986; Striegel-Moore, 1989; Zuckerman, Colby, Ware, & Lazerson, 1986). However, rather than addressing the unbalanced sex ratio among identified bulimics, research on bulimia has primarily focused on psychiatric factors, e.g., depression, impulsiveness (Crandall, 1988).

The specific social address of bulimia -- women -- indicates that socio-cultural norms play a greater role than current research suggests. Empirical findings indicate that binge eating is under substantial social control; in sorority groups, popularity and bingeing were positively correlated (Crandall, 1988). From a socio-cultural perspective, the circumstance that dieting now characterizes "normal" eating for North American women is due to a shift in the female beauty ideal toward a thin physique (Garner, Garfinkel, Schwartz, & Thompson, 1980; Polivy et al., 1987). However, even though the social pressure to be slim to be attractive, and attractive to be feminine, operates on all women, only a relative minority develops bulimia according to DSM-III-R criteria (American Psychiatric Association, 1987). Which women are particularly at risk?

Earlier work was based on the premise that bulimia is a discrete disorder (Bruch, 1973). However, apart from the extreme degree to which they engage in a widespread behavior pattern bulimics do not seem unusual. The

prevalence of eating disorders is assumed to be in direct proportion to the prevalence of dieting behavior in a given population (Hsu, 1989). Estimates suggest that by age 13, 80% of girls compared to 10% of boys have already been on a weight-loss diet (Rodin, Striegel-Moore, & Silberstein, 1990). The symptom of binge eating seems to be quite common in normal populations. Estimates suggest that 30% to 50% of high school and college students engage in binge eating (Halmi et al., 1981; Klingenspor, 1991). Corresponding to the recent assertion that bulimia represents an extreme on a continuum of weight preoccupation and dieting (Polivy & Herman, 1987), bulimic eating behavior is therefore conceptualized as a continuous variable in the present analysis.

From the perspective of social identity theory (Tajfel & Turner, 1986), it is hypothesized that an important variable in the etiology of bulimia is the composition of a woman's gender identity (e.g., the degree of femininity and masculinity). Gender or sex as a social category provides individuals with an identification of themselves in terms of value-laden attributes. In the present analysis, gender identity is conceptualized as part of an individual's social identity and refers to an individual's identification with social stereotypes of women and men (Ashmore, 1990; Tajfel et al., 1986).

What is the nature of the social stereotypes of women and men? In terms of contents, being feminine means being attuned to and responsive to the needs of others. Independence, competence, and assertiveness, that is, the psychological tools for getting one's own needs met, define masculinity. These identifications are relative rather than absolute (Tajfel et al., 1986); e.g., women are considered more compliant and passive compared to men. In terms of social desirability, the evidence is that masculine attributes are valued more than feminine attributes (Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1970; Broverman, Broverman, Clarkson, Rosenkrantz, & Vogel, 1972), i.e., sex defines membership in unequal social categories. Corresponding to this finding a number of studies indicate that adolescent girls in Western societies generally feel more miserable than adolescent boys. The average female adolescent is more anxious, insecure, depressed, and self-conscious than her male counterpart (Hurrelmann, 1991; Kandel & Davies, 1982; Tobin-Richards, Boxer, & Petersen, 1983). These sex differences in psychological well-being can be related to the pervasive experience of inequality between men and women in our culture, which women incorporate into their self-concept (Hurrelmann, 1991).

However, the influence of sex-group membership is hypothesized to depend on a woman's social identity; that is, a woman's gender identity will have a more or less positive influence on her self-concept depending on how much she identifies with feminine and masculine attributes. This general idea guided the present studies and reflects social identity theory's assumptions (e.g., Tajfel et al., 1986; Williams, 1984) that (a) social identity is constructed in an

intergroup context by means of social comparison, that (b) value-laden attributes associated with social groups and group membership have a positive or negative influence on the individual's social identity and self concept, and that (c) people are motivated by a need for a positive self-concept.

How do women strive to achieve a positive identity -- the feeling that one is valuable -- in the context of a social structure that places women in a position of less power and status compared to men? From the perspective of social identity theory, two individual strategies are available: (a) favorable social comparisons between oneself and other members of the in-group and (b) striving to leave the in-group of women and join the out-group of men (Williams, 1984). Social comparison processes within the in-group will be based on the attributes consensually associated with its members (Abrams, 1989). Women who choose this strategy would attempt to achieve a more positive identity by striving to be more feminine (e.g., to be more pleasing and/or more attractive). Efforts to join the out-group are based on assimilating to its members by internalizing and incorporating attributes associated with them. Women who choose this strategy would attempt to enhance their feelings of self-worth by striving to be more masculine (e.g., to be more independent and/or competent). Measuring gender identity provides an index of which strategy a woman is more likely to select.

Based on the central role of beauty in the social construction of femininity, bulimia has been linked to a hyperfeminine gender identity. The theoretical rationale was that individuals with high levels of femininity will tend to internalize the cultural equation of beauty with thinness unreservedly, devoting a great deal of energy to the pursuit of a thinness norm virtually unattainable for most women (Rodin, Silberstein, & Striegel-Moore, 1985). The hypothesis that bulimics overly conform to traditional gender norms was supported in a number of studies, predominantly utilizing an unidimensional measure (e.g., MMPI) of gender. Bulimic subjects were characterized as gender-typed or hyperfeminine, whereas control subjects seemed less traditional (e.g., Boskind-Lodahl, 1977; Hatsukami, Owen, Pyle, & Mitchell, 1982; Norman & Herzog, 1983; Orleans & Barnett, 1984; Rost, Neuhaus, & Florin, 1982). However, previous studies measuring femininity and masculinity as independent dimensions have yielded inconsistent results. Lewis and Johnson (1985) found lower femininity and lower masculinity in bulimics compared to controls. (4) A number of studies found no between-group differences with respect to femininity, but lower masculinity scores among bulimics compared to controls (Cantelon, Leichner, & Harper, 1986; Dunn & Ondercin, 1981; Habermas, 1990).

By way of three questionnaire studies, the present research addressed the question: How are different types of gender identity, i.e., congruence, androgyny, and masculinity, related to bulimic eating behavior? According to

the congruence hypothesis, feminine women and masculine men are considered to be healthy. Until two decades ago, the dominant conception of gender was based on a bipolar, unifactorial model, and mental health was defined as congruence between sex and gender (e.g., Terman & Miles, 1936). An important revision of this model was introduced by Bern (1974): Femininity and masculinity are now considered to be independent dimensions. The androgyny model postulates that psychological health is maximized when an individual's gender identity incorporates a high and balanced degree of femininity and masculinity regardless of the individual's sex (Bern, 1974). The masculinity model is empirically derived and simply posits that psychological health is a function of the extent to which an individual identifies with attributes associated with males independent of the individual's sex (Whitley, 1983).

The goal of the present analysis was to examine the influence of specific facets of social identity on bulimic eating behavior, rather than to test a comprehensive etiological model. It was hypothesized that gender identity is related to bulimic eating behavior indirectly, via general esteem. As compounds of an individual's social identity, femininity and masculinity are expected to have a more or less positive influence on a woman's general esteem and to determine the strategies she chooses to achieve a more positive sense of self. As the openness to socio-cultural norms increases with lower self-esteem (Janis, 1954), it is likely that lower self-esteem is related to increased vulnerability to the current thinness norm. The present analysis tested the hypothesis, that masculinity has a positive influence on a women's general esteem and, via esteem, reduces the risk of bulimic eating behavior.

Study 1 was designed to test the hypotheses that bulimic eating behavior is related to lower self-esteem, lower body esteem, and a hyperfeminine gender identity (Boskind-Lodahl, 1976). An extreme group comparison was conducted, whereby 26 normal-weight bulimics were compared to 26 subjects who had no history of weight-reduction efforts.

Based on the findings of Study 1, Study 2 was designed to provide a direct test of the question which model -- congruence, androgyny, or masculinity -- best describes the data. Competing theories on the optimal relation between gender identity and psychological health were related to bulimic eating behavior and tested within a sample of 301 North American female undergraduates. The analysis was based on the assumption that femininity and/or masculinity have direct effects on general esteem, and indirect effects via esteem on bulimic eating behavior. The congruence model posits a positive direct effect of femininity on general esteem, and a negative direct effect of general esteem on bulimic eating behavior. In contrast, the androgyny model predicts positive direct effects of both femininity and masculinity on general esteem, whereas the masculinity model predicts that masculinity alone has a positive effect on general esteem. Study 3 was

designed to cross-validate the relational structure found to be a plausible representation of the data in Study 2. The competing models described above were tested in a sample of 464 West German high school students.

The proposed design for Study 2 and 3 differs from and extends previous research on the relation between bulimia and gender identity in a number of ways. Most important, whereas previous research was limited by simple univariate statistical methods, more sophisticated multivariate methods of structural equation modeling were utilized for data evaluation. Major advantages of this methodology for theory development are (1) that complex relationships, including indirect effects, between the variables of interest can be examined simultaneously and (2) that measurement error is taken into account via latent variables.

## STUDY 1

### Method

**Subjects.** The sample was recruited in Heidelberg, West Germany, and consisted of 52 Caucasian and predominantly middle class females. 26 bulimic women were recruited by means of newspaper ads, fliers posted in public buildings, and through informal and formal self-help groups (e.g., Cinderella e. V., Overeaters Anonymous). Bulimic subjects were accepted to participate in the study only if they were normal weight, self-reported binge eating, and feeling uncomfortable if others would observe them bingeing and purging by means of self-induced vomiting, laxatives, and fasting for more than 24 h. 26 nonbulimic subjects, i.e., women with no history of bulimic symptoms, were matched by age, marital status, and educational status. The procedure used for selecting subjects who met these criteria was a short interview validated by 7 diagnostic items in the questionnaire.

The mean age was 23.8 (SD = 3.75) in the bulimic group and 23.34 (SD = 3.73) in the nonbulimic group. The age range for the entire sample was 17 to 31. The mean Body Mass Index [BMI = weight(kg)/height[(m).sup.2]] did not differ between groups. The BMI was 20.41 (SD = 2.18) in the bulimic group and 20.12 (SD = 1.31) in the control group. All subjects were single. There was no difference in the number of subjects with or without a partner between groups.

**Procedure.** Data were collected individually. Subjects that met the selection criteria completed a questionnaire including the following measures. (1) Self-esteem was measured using the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), a 10-item Likert-type scale with each item having 4 possible responses indicating the strength of agreement with the item. The higher the numerical score, the higher the self-reported level of self-esteem. (2) Body-esteem was measured using the Body Cathexis Scale (BCS: Secord

& Jourard, 1953). The BCS lists 52 aspects of physical appearance and functioning. Subjects rated their satisfaction with body parts and functions on a 5-point scale with higher scores indicating more body-satisfaction. (3) Femininity and (4) masculinity were measured using the Bern Sex Role Inventory (BSRI; Bern, 1974; Schneider-Duker & Kohler, 1988) which measures the extent of an individual's identification with cultural stereotypes of men and women. Subjects were asked to indicate on a 7-point scale ranging from "never or almost never true" to "always or almost always true" the degree to which each attribute describes her or himself. Femininity equals the self-rating for the 20 feminine items and masculinity equals the self-rating for all 20 masculine items (Bem, 1974). (5)

Gender identity is inferred from the t-test of difference between the femininity and masculinity scores for each individual. Subjects are classified as gender-typed, cross-gender-typed, androgynous, trend feminine, and trend masculine (Bem, 1974). The t-test classification procedure has been criticized for not taking the extent of femininity and masculinity endorsement into account. Although the median-split-method proposed by Spence et al. (1975) considers the extent of identification, it is associated with a number of other major problems, one being that it is likely to misclassify individuals (see Ashmore, 1990). For this reason, the original t-test-method was used in this study and group means are reported to compare the extent of endorsement.

## Results

Both hypotheses predicting between-group differences in self-esteem and body-esteem were confirmed. As Table I shows, bulimic women had lower self-esteem and body-esteem compared to nonbulimic controls.

The hypothesis that bulimia is common among gender-typed women was supported. While 62% ( $n = 16$ ) of the bulimic group were gender-typed, the majority of nonbulimic women, 58% ( $n = 15$ ), were androgynous. According to the Fisher-Yates Test this difference between groups was highly significant ( $p = .0003$ ; Lienert, 1973). As can be seen in Table I, group differences are based on hypomascularity rather than hyperfemininity on part of bulimic women.

Nonbulimic subjects appear to tend to endorse as self-relevant both female and male qualities in roughly the same proportion or amount. Their mean score on masculinity is somewhat higher than on femininity. In contrast, bulimic subjects underidentify with masculine attributes, compared to controls. Their mean score on masculinity was significantly lower compared to the nonbulimic group.

## Discussion

The results of Study 1 suggest (a) that masculinity is necessary for optimal adult female functioning in contemporary society and (b) that a failure to develop masculine attributes may be a risk factor for bulimic eating behavior.

Clinical research has indicated that low self-esteem, low body-esteem, and an overinvestment in the female gender stereotype are characteristic of bulimic women. In support of this description, the results of the first study show that bulimic women perceive themselves as possessing less self-esteem and less body-esteem. Contrary to Boskind-Lodahl's (1976) hypothesis that bulimia is linked to a hyperfeminine identity, there was no group difference on femininity. Therefore, corresponding to findings reported previously (Cantelon et al., 1986; Dunn et al., 1981; Habermas, 1990), Study 1 indicates that bulimia is linked to lower masculinity rather than higher femininity.

Table 1. Study 1: t-Test Comparison of Means on Self-Esteem, Body-Esteem, Femininity, and Masculinity

|             | Bulimics | Controls | t    | df      | p   |
|-------------|----------|----------|------|---------|-----|
| Self-Esteem | 12.62    | 18.12    | 4.45 | 50      | .00 |
| (SD)        | 4.52     | 4.39     |      |         |     |
| Body-Esteem | 105.19   | 141.54   | 5.81 | 40.3(a) | .00 |
| (SD)        | 27.56    | 16.10    |      |         |     |
| Femininity  | 66.19    | 66.38    | 0.08 | 50      | .94 |
| (SD)        | 9.22     | 7.70     |      |         |     |
| Masculinity | 54.81    | 70.54    | 4.60 | 50      | .00 |
| (SD)        | 12.35    | 12.28    |      |         |     |

a Due to unequal variances on body-esteem between groups statistics are reported according to Satterthwaites formula, which is associated with a decrease in the degrees of freedom (Steel & Torrie, 1980).

Table II. Study 1: Categorization of Gender Identity According to the BSRI (t-Test)

|                   | Cross       | Trend     | Trend     |          |    |
|-------------------|-------------|-----------|-----------|----------|----|
|                   | sex-typed   | masculine | Sex-typed | feminine |    |
|                   | Androgynous |           |           |          |    |
| Bulimics (n = 26) | 1           | 1         | 16        | 5        | 3  |
| Controls (n = 26) | 3           | 1         | 5         | 2        | 15 |

The results of Study 1 are based on a comparison of two extreme groups with respect to eating behavior, a very healthy and a very disordered one. This procedure is associated with a number of limitations, including sample selectivity and sample size. Therefore, subsequent studies involved larger samples more representative of a normal population. Since bulimia is assumed to represent an extreme on a continuum of weight preoccupation and dieting, the next step was to test the relationships between variables when bulimic eating behavior is measured as a continuous rather than a dichotomous variable. In order to examine complex relationships among variables including indirect effects simultaneously, the statistical methodology of structural equation modeling was implemented. OVERVIEW OF STRUCTURAL MODELING AND STRATEGY OF ANALYSIS

The three competing, nested models described above -- congruence,

androgyny, and masculinity -- were transformed into systems of linear structural equations and tested with covariance structure analysis (see Bentler, 1980, 1989; Bentler & Weeks, 1980; Joreskog, 1977, 1978; McArdle & McDonald, 1984). Data were analyzed with the micro-mainframe program EQS using the maximum likelihood method of estimation (Version 3.0; Bentler, 1989). Raw data were used for all analyses. The competing models were evaluated based on  $[\chi^2]$ , incremental fit indices, and individual parameter estimates provided by the program. A significant  $[\chi^2]$ -value indicates a lack of fit between the hypothesized model and the data.

Due to dependence on sample size and model complexity the application of  $[\chi^2]$  as an indicator of goodness-of-fit is problematic (see Bearden, Sharma, & Teel, 1982; Boomsma, 1982; Marsh, Balla, & McDonald, 1988). Therefore, so-called incremental goodness-of-fit indices that compare the model under consideration to the independence model (i.e., baseline model of independent or uncorrelated variables) were used as additional criteria for evaluating the competing models that were tested (Bentler & Bonett, 1980; Bentler, 1989). In addition, the average absolute standardized residuals (AASR) are also reported. The incremental fit indices used include the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), and the Comparative Fit Index (CFI). In general, values of fit indices greater than .9 are desirable.

In order to determine which model -- congruence, androgyny, or masculinity -- best describes the data each set of theoretical assumptions was translated into a set of parameter constraints. The congruence model predicts that femininity has a significant positive effect on a woman's general esteem, whereas the effect of masculinity is nonsignificant. The androgyny model would predict that both femininity and masculinity have significant positive effects on esteem. The masculinity model would predict that the effect of femininity is nonsignificant, whereas masculinity has a significant positive effect. All three models predict significant negative effects of esteem on bulimic eating behavior. The evaluation of significance is based on the z-values of parameters and the  $[\chi^2]$ -difference between the fit of the nested models. For all models reported, additional estimates (e.g., correlated residuals) that improve the level of model fit were not used.

Structural equation modeling included latent variables for femininity, masculinity, general esteem, and bulimic eating behavior. Self-esteem and body-esteem measures were used as indicators of the construct general esteem. For gender identity and bulimic eating behavior, items from the measures used were combined into groups of three parcels of items. Parcels or subscales of items were created in order to measure the underlying construct with multiple indicators at the latent level (Little, Das, Carlson, & Yachimowicz, 1993). The major advantage of using multiple indicators for each test is that the unreliability of variables is taken into account. Thereby, tests of the relationships between constructs can be performed at the "error-

free" latent variable level.

## STUDY 2

### Method

**Subjects.** In all, 301 female undergraduates from the University of Arizona between the ages of 16 and 47 participated in this study for course credit. Most respondents were Caucasian and middle class. The mean age of subjects was 20 years ( $SD = 3.42$ ). The mean Body Mass Index was 20.99 ( $SD = 3.12$ ). An estimated 7.3% of female students met modified DSM-III (American Psychiatric Association, 1987) criteria for bulimia nervosa (i.e., they were binge-eating at least twice a week and used one or more of the following purging techniques: self-induced vomiting, use of laxatives, use of diet pills, and/or fasting for 24 h or more).

**Procedure.** All subjects received a questionnaire packet that could be completed during one class period. The testing was supervised by the author. Respondents were instructed to complete the self-report measures anonymously. The same measures were used as in Study 1. One scale was added to measure bulimic eating behavior as a continuous variable, the bulimia subscale of the Eating Disorders Inventory (EDI; Garner & Olmsted, 1984). On this 7-item Likert-type scale each item has 6 possible responses ranging from "never" to "always" indicating the frequency of the experience described by the item. The higher the numerical score, the higher the self-reported level of bulimic eating behavior.

### Results

Data were inspected for multivariate normality. A check on skewness and kurtosis revealed elevated estimates for the variables measuring bulimic eating behavior. The three bulimia variables were transformed by taking the reciprocal of each value and the data were checked once again for skewness and kurtosis (Tabachnick & Fidell, 1989). Transformations reduced skewness and kurtosis in the bulimia variables, so that now all variables were within the range of +1 and -1. Multivariate outliers were identified as part of an initial EQS run. One case was deleted based on its extremely high contribution to normalized multivariate kurtosis.

Table III presents correlations between variables disattenuated for error at the latent level. Strong to moderate relationships were found between masculinity and general esteem, and between esteem and bulimic eating behavior. Both femininity and masculinity were negatively, albeit weakly, correlated with bulimia. In addition, a modest relationship was found between femininity and esteem. There was virtually no relationship between femininity and masculinity.

The structural modeling analyses specified three competing, nested models to evaluate the three hypotheses outlined above. Initial comparisons of the fit indices reported in Table IV favor the androgyny model. The congruence model was refuted. Although the incremental fit indices of both the androgyny and the masculinity model are acceptable, the examination of the parameter estimates indicated that femininity did have a significant effect. The nested comparison between the congruence and the androgyny model revealed that the fit of the model is greatly improved when the effect of masculinity is freely estimated. The nested comparison between the androgyny and the masculinity model also indicated a significant increment in fit when the effect of femininity is freely estimated, although small in comparison.

However, the significant  $[\chi^2]$ -difference between the measurement model and the androgyny model indicated that androgyny was a suboptimal model in the sense that the model fit could be improved significantly by freely estimating additional parameters. According to the Lagrange Multiplier Test (Bentler, 1989), the single parameter that would significantly improve the model fit was a direct effect of masculinity on bulimic eating behavior. According to the fit indices reported in Table IV this modified androgyny model was the best representation of the data.

Table III. Correlations Between Latent Variables in Study 2 (Below Diagonal) and Study 3 (Above Diagonal)

|                         | 1       | 2       | 3      | 4       |
|-------------------------|---------|---------|--------|---------|
| Bulimic eating behavior |         | -.40(a) | -.01   | -.13(a) |
| General esteem          | -.50(a) |         | .12(a) | .52(a)  |
| Femininity              | -.15(a) | .22(a)  |        | .11(a)  |
| Masculinity             | -.18(a) | .67(a)  | .05    |         |

a Significant.

Figure 1 presents the standardized values of the parameter estimates of the best model in the sample of female undergraduates. Whereas masculinity was negatively correlated with bulimic eating behavior in the intercorrelated factor structure of the measurement model, its direct effect in the context of the structural model was positive due to suppressor effects. The results support a modified version of the androgyny model: (a) The magnitude of the effects of femininity and masculinity on general esteem, and via latter on bulimia, differed; the effect of femininity was small in comparison to masculinity. (b) Although the indirect benefits via esteem (-.47) outweighed the direct costs, the data suggested that masculinity may have a positive direct effect on bulimic eating behavior (.30). However, latter effect needs to be replicated before an interpretation is justified. Discussion

The major goal of Study 2 was to explore the idea that masculinity positively contributes to esteem and reduces the risk of bulimia for women. This was done by testing competing hypotheses relating gender identity and general esteem to bulimic eating behavior from a multivariate perspective. Structural modeling techniques were utilized to examine complex relations between the

variables of interest simultaneously. In contrast to the extreme group comparison used in Study 1, competing models (androgyny, congruence, masculinity) were examined within the continuum ranging from absence of bulimic symptoms to serious problems with bulimia represented in the sample. Corresponding to Study 1, the results suggest that masculinity is important for the general esteem of young adult women, maybe more important than femininity, and, via esteem, reduces the risk of bulimia. The effects of femininity on esteem, and via esteem on bulimia, were considerably smaller compared to the effects of masculinity.

#### TABULAR DATA OMITTED

In the face of the cross-sectional nature of Study 2, causal interpretations are premature. Study 3 was designed to cross-validate the findings of Study 2. This time data were collected in a sample of German female high school students, i.e., adolescents. As bulimic symptoms usually begin to appear during the period of adolescence, this procedure reduces the possibility that the findings are related to the long-term consequences rather than the causes of bulimic eating behavior.

### STUDY 3

#### Method

**Subjects.** In all, 464 Caucasian female high school students between the ages of 13 and 20 participated in this study. Students were recruited from three Gymnasien (i.e., a type of public high school in the German school system) in Heidelberg and Mannheim. Graduation from a Gymnasium is the entrance ticket to a university education. The student population of this type of high school is predominantly middle class; only 14% are blue collar (Kohler, 1992). 71% of the target population, that is of all female students visiting 8th to 13th grade, volunteered to participate in an anonymous questionnaire study. The mean age of subjects was 16 years ( $SD = 1.76$ ). The mean Body Mass Index was 19.97 ( $SD = 2.44$ ). An estimated 2.6% of subjects between the ages of 13 and 15 met modified DSM-III-R criteria for bulimia nervosa (American Psychiatric Association, 1987; see above). The prevalence of bulimia nervosa was much higher in middle adolescence: 8.9% of subjects between the ages of 16 and 18 were identified as bulimic.

**Procedure.** The procedure and the measures used were the same as in Study 2 with three exceptions. (1) In order to capture a greater range of interindividual variability, a 5-point scale was used for the Rosenberg Self-Esteem Scale. (2) A different measure -- the Physical Attractiveness Scale -- was selected to assess body esteem, primarily because this measure was specifically designed for adolescent samples (Hormann, 1986; Marsh & O'Neill, 1984). (3) An additional indicator of bulimic eating behavior was included, the

bulimia subscale of the Anorexia Nervosa Inventory (ANIS; Fichter & Keeser, 1980).

## Results

Data were inspected for multivariate normality. As in Study 2, reciprocal transformations were applied to the bulimia variables. Transformations reduced skewness and kurtosis in the three transformed variables, so that all variables were within the range of +1 and -1. Multivariate outliers were identified as part of an initial EQS run. Three cases were deleted based on their extremely high contribution to normalized multivariate kurtosis.

Table III reports correlations between variables disattenuated for error at the latent level. Similar to Study 2, the strongest relationships were found between masculinity and general esteem, and between esteem and bulimia. Again, the correlation between femininity and esteem was small in comparison. Masculinity was negatively correlated with bulimic eating behavior. In contrast to Study 2, there was no relationship between femininity and bulimia. This time, the relationship between femininity and masculinity was significant.

Corresponding to Study 2, the structural modeling analyses specified three competing, nested models to evaluate the three hypotheses outlined. Fit indices and nested comparisons are reported in Table V.

According to the fit indices reported in Table V, both the androgyny model and the masculinity model survived statistical criteria of acceptable fit to the data. However, the examination of individual parameter estimates indicated that the effect of femininity was nonsignificant. Correspondingly, the nested comparison of both models indicates that adding a femininity effect does not yield a significant increment in fit. The masculinity model was viewed as the best representation of the relational structure in the sample of female adolescents. The nonsignificant  $[\chi^2]$ -difference between the measurement model and the masculinity model indicated that masculinity was an optimal model. Figure 2 presents the standardized values of the parameter estimates.

## Discussion

The major goal of Study 3 was to cross-validate the findings of Study 2. The results of the analyses performed underscore the importance of masculinity for female well-being. Corresponding to the findings of Study 2, Study 3 supported the hypothesis that masculinity positively contributes to general esteem and reduces the risk of bulimia. When all of the evaluation criteria were taken into account, only the masculinity model survived statistical criteria of acceptable fit to the data in the adolescent sample. In contrast to

Study 2, masculinity was not Janus-faced, i.e., a direct effect contributing to bulimic eating behavior in addition to the preventive effect via esteem was not found. In addition, the effect of femininity was not significant.

The results of Study 3 seem to refute the hypothesis that measuring up to culturally mandated, "sex-appropriate" norms is a source of psychological health for women (e.g., Josephs, Markus, & Tafarodi, 1992). Regarding the achievement of a positive sense of identity, the results show that in contrast to femininity developing masculinity seems to be important. The positive effect of masculinity corresponds to the greater esteem the current socio-cultural milieu attributes to men and masculinity compared to women and femininity (Broverman et al., 1970). In addition, masculinity had an indirect influence on bulimic eating behavior, which was mediated by esteem. Evidently, women who internalize and incorporate attributes generally ascribed to the opposite sex, i.e., masculinity, appear to be successful in achieving a more positive sense of identity and, via esteem, seem more resilient to bulimic eating behavior.

## GENERAL DISCUSSION

The fact that one of the major risk factors for bulimia nervosa is being a member of the social group of women was the starting point for three empirical studies. From a sociocultural perspective, the central role of TABULAR DATA OMITTED beauty in the social construction of femininity and the current beauty ideal of extreme thinness explain the emergence of this new eating disorder. The sex-specific incidence of bulimia nervosa implies that the social construction of sex plays an important part in the etiology of this disorder. However, even though feeling too fat and dieting have become a way of life for most women, only a relative minority develops bulimia nervosa. From the perspective of social identity theory, the influence of group membership on a woman's personal identity depends on her social identity, i.e., gender identity. The major goal of this project was to examine the relationship between gender identity and bulimic eating behavior.

The general idea that guided this research was that the composition of a woman's gender identity influences general esteem, and, via esteem, bulimic eating behavior. In the context of a social structure where sex defines membership in unequal social categories, two strategies that enable women to achieve a more positive sense of self and thereby increase resilience to bulimia were considered: (a) Striving to be more feminine, thereby enabling favorable social comparisons between oneself and other members of the in-group and (b) striving to be more masculine, i.e., to leave the in-group of women and join the out-group of men (Williams, 1984).

In this investigation, two statistical methods -- simple univariate tests of difference between groups and multivariate methods of structural modeling --

were used to test competing hypotheses on the relation between gender identity, general esteem, and bulimic eating behavior. Cross-sectional data were collected from subjects in different life phases (adolescence and young adulthood) living in different cultural settings (USA and West Germany). The results of this series of three studies point out a consistent pattern of relations between gender identity, esteem, and bulimic eating behavior.

The limitations of Study 1 in terms of sample size, sample selectivity, and extreme group comparison were considered in the following studies by moving to more representative samples. In Study 2 and Study 3, every attempt was made to ensure that individuals were sitting as far apart as possible. However, some underreporting of the true bulimic behaviors is possible due to social desirability and loss of privacy in the classroom setting. The fact that a consistent pattern of findings regarding the importance and indirect effect of masculinity was found in spite of these restrictions suggests that the findings are robust.

Study 1 was intended to test the hypothesis that bulimic eating behavior occurs among very feminine women who are particularly concerned about living up to current thinness standards of female beauty (Boskind-Lodahl, 1976). However, the results appear to reject this hypothesis. Rather than overidentifying with feminine attributes, bulimics were found to underidentify with masculine attributes compared to nonbulimic controls. This finding was underscored by Study 2 and Study 3, which indicated that women who are able to identify with attributes characteristic of the male stereotype are better off. Masculinity had a positive direct effect on esteem and an indirect negative effect, via esteem, on bulimia. Thus masculinity emerges not as a direct cause of healthy eating, but as a precursor mediated through general esteem. The fact that a similar pattern of relationships was found in different samples, in different -- albeit both Western -- cultural contexts using partially different measures and statistical methodologies strengthens rather than weakens its validity. Due to the use of slightly different measures in Study 2 and 3, testing the structural stability across samples by means of multiple group comparisons was not possible. However, the effect sizes are rather similar in both samples, i.e., the adolescent and the young adult sample.

Whereas masculinity alone appeared to be relevant for general esteem among adolescents (Study 3), femininity had a significant positive, albeit small effect among young adults (Study 2). Thus, the data supported Bem's hypothesis in that psychological well-being is not associated with one-sided compliance to the "proper" gender role on part of women. Rather, bulimic eating behavior seems to be associated with lower levels of "sex-inappropriate" identification, i.e., masculinity. This result is in stark contrast to classic psychoanalytic theory which postulates that psychological well-being is based on congruence between sex and gender and that a rejection of femininity underlies bulimia (see Bruch, 1973).

The greater esteem the current sociocultural milieu associates with masculinity compared to femininity explains their differential influence. In addition, conflicting ideologies inherent in the current cultural context add to the explanation of the negligible effects of femininity in contrast to masculinity. In order to conform to their "proper" role in the realm of domesticity, women are expected to provide food for others. Yet they need to deny themselves that very same food in order to meet expectations of femininity that emphasize the importance of physical attractiveness and currently equate attractiveness with slimness (Charles & Kerr, 1986).

The recent rise of the sex-specific eating disorder bulimia nervosa has provoked three central questions: Why now? Why women? Which women? (Striegel-Moore, Silberstein, & Rodin, 1986). Regarding the historical timing, a primary explanation is that social change (i.e., the beginning dissolution of traditional sex-role differentiation) involves conflicting social messages to women (Rodin et al., 1985). The argument is that antagonistic social forces currently prescribe historically "sex-appropriate" norms (femininity) and new, formerly "sex-inappropriate" norms (masculinity) simultaneously. While new expectations of masculinity in women have evolved, women are still being pressured to meet traditional expectations of femininity, and social sanctions continue to be imposed on females who exhibit characteristics considered desirable for males (Hurrelmann, 1991). The extreme methods used by bulimics to appear thin, attractive, and feminine could represent an attempt to alleviate anticipated negative social reactions to masculinity in women, to the pursuit of autonomy and individuation.

Studies that have examined the role of gender identity conflict in disordered eating behavior are based on different hypotheses regarding the locus of this conflict (internal versus external). In Steiner-Adair's (1990) model, women who incorporate modern society's ideal of autonomy and individuation come into conflict with an internal need to develop feminine-relational aspects of themselves. Silverstein, Carpman, Perlick, and Perdue (1990) hypothesize that gender identity conflict emerges in women who seek to achieve in traditionally masculine areas and experience external constraints that seem related to being female. Both models predict that women with disordered eating will ascribe to higher levels of masculine attributes in their personal ideal. Empirical findings are somewhat inconsistent. Silverstein et al. (1990) found that women with non-traditional gender role aspirations, and those who indicate conflict regarding their femaleness (e.g., wishing they had been born a male), are more likely to report disordered eating. Paxton and Sculthorpe (1991) found that disordered eating was associated with greater self-discrepancy between actual and ideal masculinity. However, the discrepancy was primarily due to lower masculinity in the actual self; women with higher eating disordered scores did not have higher levels of masculine attributes in their ideal.

The present findings supported previous findings of significant relationships between masculinity, as it is defined by normative gender stereotypes, and female esteem (e.g., Orr & Ben-Eliahu, 1993). In addition, the results suggested one view of a process where the masculinity/esteem relationship is an important antecedent of the specific outcome of bulimic eating behavior. Of course, it is important for future research to examine how these normative conceptions might be idiosyncratically transformed (Orr et al., 1993), and to investigate where masculine self-discrepancies may be a better predictor of psychological health than masculinity in the actual self alone (Grimmell & Stern, 1992).

Although an emerging double-bind of social sex-specific expectations sounds like a good answer to the "why now?" and the "why women?" question, and gender identity conflict may add to the explanation of "which women?", these factors were not examined here. Study 1 focused on the question of which women were particularly at risk for bulimia. Studies 2 and 3 addressed the question of which strategy, in terms of gender identity, is most effective in reducing a woman's risk of developing bulimia. The main result of these studies seems to be especially provocative: Identifying with masculine attributes appears to be an effective strategy for achieving a positive self concept and for reducing, indirectly, the risk of bulimia. Of course this interpretation is problematic in the face of the cross-sectional nature of the three studies, and longitudinal research is needed. Whether developing masculinity constitutes a desirable long-term strategy remains to be evaluated.

3 Abbreviated as "sex" hereafter.

4 Lewis et al. (1985) report finding no differences between bulimics and controls with respect to masculinity, but higher femininity scores in controls. However, it seems that the authors did not take the unequal variances between groups on masculinity into account (Steel & Torrie, 1980). A reanalysis of their data according to the tables reported in Lewis et al. (1985) revealed that the masculinity scores were in fact significantly lower in the bulimic group compared to the control group.

5 German versions of the instruments were used, The German version of the BSRI (Schneider-Duker & Kohler, 1988) has the advantage that it does not include the two items feminine and masculine that are considered problematic in the original version by Bern (see Ashmore, 1990; Pedhazur & Tetenbaum, 1979).

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