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Discrimination and Eating Disorder Psychopathology: A Meta-Analysis

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Abstract

Eating disorders occur in diverse populations, and discrimination may be a specific factor that is related to higher eating disorder psychopathology among marginalized individuals. To evaluate the current evidence on this topic, a meta-analysis was used to quantitatively synthesize the literature on discrimination and eating disorder psychopathology across a heterogeneous range of studies. Searches were conducted in peer-reviewed journals and accessible unpublished dissertations of all years through January 2020. Studies were coded by two authors using a tailored coding form, and zero-order bivariate correlations were used as effect size measures. There were 55 cross-sectional studies extracted for inclusion in the meta-analysis. Results showed a small-to-medium association between discrimination and eating disorder psychopathology that was consistent across domains. Effects sizes were typically higher for weight discrimination. For binge eating and general eating disorder pathology, effects were smaller in studies that had larger proportions of women, and for binge eating only, effects were higher in college samples. These findings could suggest that discrimination represents a contributory factor related to eating disorder psychopathology across types of discrimination and eating disorder psychopathology. Implications are discussed for future research on discrimination and psychopathology including possible mechanisms.

Keywords: discrimination; feeding and eating disorders; body image; meta-analysis; vulnerable populations

Historically, eating disorders (EDs) have been considered disorders that primarily affect affluent White women (Sonneville & Lipson, 2018). However, a burgeoning array of research has revealed that eating disorders afflict diverse groups of individuals with regard to race, gender, sexual orientation, gender identity, and weight status (Schaumberg et al., 2017). Further, marginalized or stigmatized groups—including lesbian, gay, bisexual, and transgender (LGBT) individuals, racial and ethnic minorities, and individuals with obesity—have been shown to be at similar or greater risk of disordered eating compared to their non-marginalized counterparts (Beccia et al., 2019; Hudson et al., 2007; Mason et al., 2018). For example, studies have shown higher risk of disordered eating among LGBT youth and adults compared to heterosexuals with some differences in magnitude by subgroups (i.e., greater disparities among males and transgender individuals; Calzo et al., 2017); more disordered eating behaviors among individuals with overweight and obesity compared to individual in the normal weight category (Nagata et al., 2018); and elevated disordered eating and weight control behaviors among racial and ethnic minority individuals compared to non-Hispanic White individuals (Beccia et al., 2019; Rodgers et al., 2017).

EDs generally involve maladaptive eating- and body-related behaviors and cognitions (e.g., body dissatisfaction, drive for thinness, binge eating, restriction, and compensatory behaviors), and they are associated with a myriad of negative mental and physical health consequences (Hudson et al., 2007; Kessler et al., 2013; Udo & Grilo, 2019). Although EDs affect diverse groups of individuals, theoretical and empirical research has often focused on general psychosocial factors that increase risk for ED psychopathology (see Pennesi & Wade, 2016 for a review). However, additional factors unique to marginalized groups, particularly

experiences of discrimination, may be key influences that contribute to ED risk in these populations (Meyer, 2003).

Discrimination, or "unfair treatment by others on the basis of one's social group membership" (Grollman, 2012, p. 200), is a rather common experience among adults, with a population-based survey finding that 33.5% of adults experienced major lifetime discrimination, and 60.9% of adults experienced day-to-day discrimination (Kessler et al., 1999). Under the umbrella of discrimination includes victimization, harassment, and stigma enacted by others. Research consistently demonstrates that discrimination is damaging to both mental and physical health (Krieger, 2000). For example, in a population study of adults, day-to-day discrimination and lifetime discrimination were both associated with increased odds of generalized anxiety and major depression (Kessler et al., 1999). Also, a host of studies demonstrate that self-reported perceived discrimination associated with gender, race, sexual orientation, and weight is associated with more distress, physical symptoms, negative affect, and perceived stress (Hatzenbuehler, 2009; Pascoe & Smart Richman, 2009; Sikorski et al., 2015). The experience of discrimination may be important in explaining risk for EDs, disordered eating, and body image concerns among marginalized groups. This has been supported by research showing perceived discrimination generally and across race, sexual orientation, and weight is associated with increased global ED psychopathology and specific ED symptoms including binge eating and body image disturbance and body shame (e.g., Harrington et al., 2006; Kwan et al., 2018; Mason & Lewis, 2015; 2016).

Numerous theoretical models have been developed to account for the observed links between discrimination and adverse health outcomes. Generally, these models conceptualize discrimination as a stressor that leads to negative mental health through various stress-related

processes (Hatzenbuehler, 2009; Meyer, 2003). For example, borne out of earlier research on racism (e.g., Clark et al., 1999), Meyer (2003) proposed that minority stressors associated with sexual orientation, racial/ethnic identity, and gender, specifically perceived discrimination, are associated with adverse mental health outcomes, though there are important variables that may moderate the relationship between discrimination and negative health outcomes (Meyer, 2003). In a recent review, Sikorski and colleagues (2015) extended minority stress models to weight stigma and provided evidence that discrimination based on weight and appearance can lead to negative mental health.

These models have been extended to other forms of discrimination and mental health outcomes, including eating psychopathology (Mason et al., 2018; Sikorski et al., 2015). That is, recent models have specifically theorized that discrimination may serve to increase proximal risk factors related to EDs. For example, in a theoretical model of ED symptoms among sexual minority women derived from a review of empirical evidence, Mason and colleagues (2018) suggested that sexual orientation and gender discrimination leads to internalized biases and shame toward oneself, poor social and coping resources, and negative affect and body dissatisfaction, which in turn, increased risk for ED symptoms.

In daily diary studies, sexual orientation and gender discrimination have been associated with increased daily negative affective states on the same day (Hatzenbuehler et al., 2009; Mason et al., 2017a). Negative affective states have been shown to precipitate ED cognitions and behaviors (Haedt-Matt & Keel, 2011). Further, in a daily process model in lesbian women, daily mindful attention awareness and negative affect mediated the link between daily gender and sexual orientation discrimination and binge eating (Mason et al., 2017a). Some have also contended that discrimination may increase individuals' desire to adhere to sociocultural

standards of thinness in order to reduce future discrimination (e.g., Mason & Lewis, 2016). Furthermore, the stigma maintenance model of dysregulated eating delineates stigma and discrimination as precipitants of maladaptive momentary affect regulation strategies, which in turn, increase momentary states of negative affect that ED behaviors may be used to cope with (Mason et al., 2019). In short, the model proposes that ED behaviors, such as binge eating, may be used to cope with experiences of discrimination and stigma.

Despite the growing empirical and theoretical work examining the role of discrimination in ED psychopathology, a comprehensive quantitative synthesis of the association between discrimination and disordered eating and body image concerns has yet to be conducted. This is necessary to more precisely characterize the nature and extent of these relationships, which will ultimately serve to inform theoretical models, future research efforts, and interventions for EDs that are more applicable to the experiences of marginalized groups. Therefore, the purpose of this meta-analysis was to quantify the magnitude and robustness of associations between discrimination and harassment and ED symptoms (i.e., global symptoms, binge eating, restraint, and body image concerns).

It was expected that there would be a significant positive overall relation between discrimination and harassment and ED symptoms. Differing relations between discrimination and specific ED symptoms was more exploratory. Effects were reported for all discrimination types combined as well as separately for each type of discrimination (i.e., general/global, gender/sexual harassment, racial, weight, and sexual orientation). In addition, study level characteristics were examined as moderators of these associations, including sample population, age, sex, body mass index year of publication. Given the salience of weight concern to ED

psychopathology, it was expected that weight discrimination would have the strongest association with ED symptoms.

Method

Search Strategy and Study Selection

This manuscript followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist (see Supplementary Figure 1). This review was not prospectively registered. Searches were conducted by the first author in PsycInfo and PubMed databases using the following terms applied to the title and abstract : "discrimination", OR "harassment", OR "stigma", OR "minority stress" OR "microaggressions", OR "prejudice", OR "victimization" paired with "eating disorders", OR "disordered eating", OR "binge eating", OR "body image", OR "anorexia", OR "bulimia" OR "body dysmorphia", OR "restriction". Figure 1 displays the PRISMA diagram, which summarizes the study selection process. Empirical articles in peer-reviewed journals and accessible unpublished dissertations of all years through January 2020 were included. Inclusion criteria were availability of the study in English and inclusion of correlations between measures of discrimination or harassment and ED psychopathology. Authors were contacted in January 2020 to provide data for studies that met all criteria but did not report bivariate correlations; two authors provided data. The search process resulted in 55 articles that were included in the meta-analysis. Only cross-sectional correlations were examined given only one longitudinal study was found.

Data Collection

A coding form was developed in order to extract descriptive and quantitative information from each study including study name, sample population (i.e., college/university, community, psychiatric, or mixed/other), mean age, gender of sample (i.e., percent female), race of sample

(i.e., percent Caucasian), mean body mass index, publication date, country (i.e., United States vs. not), discrimination measure, discrimination type (i.e., general/global, racial/ethnic, gender, LGBT, weight/obesity, or sexual harassment), ED measure, ED symptom type (i.e., general/global eating ED symptoms, body dissatisfaction, binge eating/loss of control eating, restraint, or other—such as drive for muscularity or night eating), bivariate correlation value, and sample size.

Articles were coded by two separate coders (TM and PM). Reliability was calculated after completion of coding with kappa=.70 as the cutoff for adequate reliability. Acceptable agreement was found between the coders on extracted variables (kappa=.83), and, discrepancies between coders were resolved by consensus. The data that support the findings of this meta-analysis are openly available in Supplementary Table 1. Because there was only one study that specifically examined gender discrimination and the conceptual overlap between the measures of gender discrimination and sexual harassment, the gender discrimination and sexual harassment studies were combined into one category.

Assessment of Study Quality

A quality score was assigned to each study by author SW using a modified version of the Newcastle-Ottawa Scale, adapted for assessing quality of cross-sectional studies (Modesti et al., 2016). The scale was used to assess (1) representativeness of sample (one point for random and nonrandom sampling; zero points for selected group of users or no description of sampling), (2) sample size (one point for justification and zero points for no justification), (3) response rate (one point for description of response rate and zero points for no description), (4) ascertainment of the exposure (two points for validated measure; one point for non-validated measure but was described; zero points for no description of measure), (5) objectivity/reliability of outcome

determination (two points for interview measure, one point for self-report measure, and zero points for no description), and (6) appropriate statistical analyses (one point for clear description and appropriateness and zero points for no description of not appropriate). The highest quality score possible was eight. A second author (TM) coded a quality score for 25% of the articles to obtain inter-rater reliability. The intra-class coefficient was .80 indicating adequate agreement.

Statistical Analyses

Overall effect sizes for associations between discrimination and each dependent variable were assessed by zero-order Pearson's correlation coefficients (*r*), the magnitude of which was interpreted as small (.10), medium (.30), or large (.50; Cohen, 1992). In order to ensure independence for each study contributing to the overall effect size, each study was allowed to only contribute one effect size per overall effect size (Lipsey & Wilson, 2001). Therefore, if studies reported multiple measures of the same construct (e.g., two measures of body image concerns), these data were aggregated in overall effect size calculations.

For effects comprised of at least five studies, a random effects model was applied, which assumes that the variability in effects is due to both within-study sampling error and between-study variance (Hedges & Pigott, 2004; Lipsey & Wilson, 2001). The random effects model takes into account possible variations in study procedures and settings, which is thought to provide more generalizable results (Lipsey & Wilson, 2001; Rosenthal, 1995). A fixed effect model was applied for effects consisting of four or fewer studies (Borenstein, personal communication during workshop, 2013).

Heterogeneity of the overall effect size distribution was assessed by the *Q* and the I^2 statistics. The *Q* statistic assesses the statistical significance of heterogeneity, whereas I^2 indicates the proportion of total variability in a set of effect sizes that is due to true between-

study differences (Huedo-Medina et al., 2006). The I^2 statistic can be interpreted such that percentages of 25, 50, and 75 represent low, medium, and high degrees of between-study variability, respectively.

Meta-regression. If the overall effect size had substantial heterogeneity (i.e., significant Q value and I^2 statistic $\geq$ 50%), random effects meta-regression using maximum likelihood procedures was applied to examine the relationships of covariates (moderators) on effect sizes. Previous research has suggested that a minimum of ten studies are needed for each covariate in meta-regression models (Bornstein et al., 2009). Thus, univariate and multivariate meta-regression was only conducted for effects consisting of at least 10 studies per covariate.

To determine the most parsimonious meta-regression models, a two-step approach was used. First, the following methodological variables and sample characteristics were examined as candidate predictors of effect size magnitude at the univariate level: age, sex (percentage of women), population (i.e., community, college/university, or mixed/other), and type of discrimination (i.e., gender, racial, LGBT, weight, other, and sexual harassment). Body mass index (BMI) was also examined as a predictor of effects for weight discrimination. Covariates that were significant predictors of effect size (p<.05) at the univariate level were retained in a multivariate model. Comprehensive Meta-Analysis Version 3.0 (Borenstein et al., 2014) and SPSS version 24.0 were the statistical programs used to conduct analyses.

Publication Bias

Both published articles and unpublished theses/dissertations were included in the literature search to minimize possible publication bias (i.e., the file drawer problem). Also, a funnel plot was created to evaluate the relationship between sample size (standard error) and effect size. According to a funnel plot, evidence of publication bias is possible when studies are

asymmetrically distributed around the mean effect size (Borenstein et al., 2009). However, visual interpretation of funnel plots is somewhat subjective, and importantly, asymmetry may arise from multiple factors, including heterogeneity, methodological quality, reporting bias, and chance (Sterne et al., 2011). Egger's regression test was also conducted to quantify the relationship between sample size and effect size, in which the presence of bias is indicated by a significant Egger's regression intercept (p<.05).

Results

Study Characteristics

There were 55 papers which consisted of 54 unique studies of 59 unique samples; these studies are summarized in Supplementary Table 2. The mean sample age ranged from 8.40 to 47.40 years (*M*=24.62, *SD*=7.67). Studies ranged in year of publication from 1999 to 2019. Samples were predominately female (mean percentage of female participants=62.78, *SD*=42.63) and Caucasian (mean percentage of Caucasian participants=51.76, *SD*=35.39). With respect to sample population, 19 samples were drawn from college/university settings (35.2%), 29 were drawn from community settings (53.7%), and 7 were drawn from other/mixed settings (11.1%). There was a high degree of variability with regard to measures used to assess discrimination and ED psychopathology. Quality ratings of studies were generally on the higher end of the rating scale (*M*=5.28; *SD*=0.68; see Supplementary Table 2 for quality ratings).

Table 1 displays overall effect sizes and heterogeneity for the associations between discrimination (i.e., combined, general, racial, gender discrimination/sexual harassment, LGBT, weight, other) and each dependent variable. Individual effects coded from each study are available as supplementary material. There was a significant association between continuous combined measures of discrimination and combined ED psychopathology, as reflected by a

small to medium positive effect (*r*=.25). With respect to specific types of ED psychopathology, effects were similar in magnitude (*r*=.17-.26), though there were few studies that assessed restraint (*k*=4). For general measures of discrimination, effects ranged ranged from .18 to .36; for racial discrimination, effects ranged from .15 to .29; for gender discrimination/sexual harassment, effects ranged from .16 to .33, for LGBT discrimination, effects ranged from .08 to .29; and for weight discrimination, effects ranged from .16 to .39. With respect to publication bias, the funnel plot (see Figure 2) and results of Egger's test (intercept=1.01, *SE*=.82, *p*=.22) did not indicate clear evidence of publication bias.

Moderators of Effect Sizes

In addition, there was substantial heterogeneity (i.e., significant *Q* value and I^2 statistic $\geq$ 50%) in the effect size distributions for overall (combined) ED psychopathology, binge eating, body image concerns, and general ED psychopathology, prompting the investigation of possible covariates (i.e., moderators) that account for the observed variance in these effects. While the effect for "Other" measures of ED psychopathology also demonstrated significant and substantial heterogeneity, moderations were not pursued given that there were fewer than 10 studies available for this effect size. In addition, there was substantial heterogeneity in effect size distributions (with $k \geq 10$) for associations between gender discrimination/sexual harassment and general ED psychopathology; between LGBT discrimination and combined ED psychopathology; and between weight discrimination and both combined ED psychopathology and body dissatisfaction.

Univariate meta-regression models examining each covariate are displayed in Table 2. For univariate meta-regression models examining the effect for binge eating, population emerged as a significant moderator (R^2 analog=.46), such that effects were smaller in community samples

compared to college samples. Univariate meta-regression analyses for general measures of eating psychopathology indicated a significant moderating effect of gender (R^2 analog<.01), in that effects of larger proportions of females. Multivariate models were not pursued given the lack of multiple univariate effects within each domain.

Discussion

EDs and related pathology affect diverse groups of people, and discrimination may be an important factor that increases risk for the development of eating disorder pathology, particularly among marginalized groups. However, there has yet to be a comprehensive quantitative review characterizing the association between discrimination and ED psychopathology. This meta-analysis showed a small-to-medium association between discrimination and ED psychopathology that was similar in magnitude across domains (i.e., global symptoms, body dissatisfaction, binge eating, and restraint).Theoretical models suggest that discrimination may lead to negative outcomes, including ED psychopathology, via a range of psychosocial pathways (Hatzenbuehler, 2009; Mason et al., 2018). For example, discrimination may lead to internalization of societal attitudes as well as maladaptive coping mechanisms and social isolation that then lead to heightened distress creating vulnerability to disordered eating.

Further, in general, effects sizes were similar across the specific types of discrimination. In examining trends, results showed a higher effect size for weight discrimination and body image concerns compared to other types of discrimination. Weight discrimination may have a stronger relation to body dissatisfaction given the body-related nature of this type of discrimination. In addition, moderation analyses showed higher effect sizes for binge eating and discrimination for college samples. College represents a transitional time when young adults are adjusted to a new environment. Young adults begin to be solely responsible for their eating, and

in addition, college campuses are surrounded by unhealthy food environments and all-you-can-eat dining halls which can increase the possibility of binge eating (Horacek et al., 2013). Further, research suggests that those who reported more bullying and perceived discrimination had a more difficult time adjusting to college (Jantzer & Cashel, 2017). Binge eating may be utilized as a coping mechanism for these adjustment issues, and changes in eating and the food environment in college may promote this.

For binge eating and general ED psychopathology, the effect of discrimination was smaller in samples comprised of larger proportions of females. This is consistent with research that has found stronger associations between discrimination and negative psychological symptoms among men compared to women (Assari et al., 2017; Assari & Lankarani, 2017). Social support is hypothesized to be an important buffer of the negative impacts of discrimination (Meyer, 2003); however, research shows that men may have less social support compared to women (Turner, 1994). Further, men may experience self-stigma regarding seeking help for mental health issues that prevents them from seeking help for psychological problems (Griffiths et al., 2015). This stigma may also compound with other types of stigma they are experiencing to produce worse outcomes.

Most studies in this review only examined one type of discrimination. However, intersectionality research suggests that experiencing multiple forms of discrimination is even more detrimental to health compared to only experiencing one form (Bowleg, 2008; Grollman, 2012). Experiencing multiple forms of discrimination can have an additive effect on negative outcomes as well as an interactive effect (Bowleg, 2008). For example, an additive effect might be testing whether, in a multivariate model, weight and sexual orientation discrimination each explain unique variance in ED psychopathology, and an interactive effect might be testing

whether individuals who experience both weight discrimination and sexual discrimination have differing ED psychopathology compared to those experiencing only one or neither. Additive and interactive intersectionality discrimination models have found important relations in regard to other aspects of psychopathology (e.g., Cormack et al., 2018; Szymanski & Owens, 2009), but more research is needed testing intersectionality models in eating disorders. While additive and interactive approaches are meaningful, these models are limited in that they may not truly capture the unique experiences of people with multiple marginalized identities (Bowleg, 2008). That is, while a Black lesbian woman may experience discrimination due to being Black, due to being a lesbian, and due to being a woman, they may also experience specific discrimination related to being a Black lesbian woman. Only one study in our review used a measure of discrimination that considered intersectionality in this way. Specifically, Dunn and colleagues (2019) examined associations of gendered racism and body image among Black women.

Although this meta-analysis revealed a significant correlation between discrimination and ED psychopathology across a heterogenous set of studies, there are a number of limitations worth noting. First, the majority of studies used college and community samples, and this body of research has seldom studied clinical samples of individuals with EDs. In addition, only two studies included samples of adolescents; more research is needed on discrimination and ED psychopathology in adolescents. Second, studies almost exclusively used self-report questionnaires to assess ED psychopathology, which are limited by retrospective reporting biases. Also, studies focused primarily on general/global ED psychopathology and body image concerns and much less on specific ED symptoms (e.g., binge eating, restraint, drive for muscularity). Future studies should use interview and naturalistically assessed measures of ED psychopathology as well as specific symptoms. Third, while body image concerns are comprised

of a number of subconstructs (e.g., social physique anxiety, body appreciation), these were combined into one effect size. Although these measures are often highly correlated, combining these measures does not allow us to examine the effect of discrimination on specific facets of body image.

Fourth, discrimination was assessed using self-report measures completed by the target of the discrimination, which likely includes both the individuals' account of objective, or actual, discrimination as well as subjective, or perceived, discrimination. It is important in future research to delineate between actual and perceived discrimination and to characterize their differential impact on EDs. In addition, future research should include measures that capture intersectionality (e.g., gendered racism). Fifth, the discrimination and ED literature is primarily cross-sectional; as such, this meta-analysis only included cross-sectional findings. Therefore, directionality and causality of associations cannot be confirmed. A particularly important direction for future research will be examination of longitudinal associations between discrimination and ED psychopathology to evidence for potential causal relations and maintenance mechanisms. Sixth, it also important to note that statistical tests of funnel plot asymmetry (e.g., Egger's test) often have lower power, and thus publication bias cannot be excluded in the absence of a significant Egger's test (Sterne et al., 2011). Seventh, as previously discussed, studies often only examined one type of discrimination within a rather small sample. More research is needed to examine multiple types of discrimination and ED outcomes, which would require larger, diverse samples. Finally, this review only included published research; there may be unpublished data that could have been relevant for inclusion.

Further, future research should study what factors may buffer the association between discrimination and ED psychopathology. Models of discrimination and health often describe

social support and group identity (e.g., how central one's marginalized identity is to them) as important buffers of the relationship between discrimination and mental and physical health (Meyer, 2003; Pascoe & Smart Richman, 2009). However, the buffering role of social support and group identity on the relation between discrimination and ED psychopathology has rarely been examined. Studies have found that increased social support and positive attitudes toward one's group identity are linked to lower disordered eating (Mason & Lewis, 2017b; Watson et al., 2013). Yet, only one study examined these variables as possible buffers of discrimination. Specifically, Sabik and Tylka (2006) found that aspects of feminist identity (i.e., greater integration between oneself as a woman and as an individual and greater active commitment to women's rights) buffered the impact of sexist events on disordered eating. Although, other research has found social support and group identity to buffer the association of other risk factors on disordered eating. Specifically, Wonderlich-Tierney and Vander Wal (2010) found that social support buffered the impact of social anxiety on disordered eating, and Watson et al. (2013) found that affirmative attitudes towards one's identity as an African American buffered the impact of body dissatisfaction on disordered eating. Overall, more research is needed to examine social support and group identity as buffers of different types of discrimination in diverse groups.

In addition to implications for future research, this meta-analysis has implications for clinical practice. Current empirically supported therapies for EDs do not explicitly discuss discrimination as an important target to address in therapy (Pennesi & Wade, 2016). Therefore, this meta-analysis underscores the importance of addressing discrimination in psychotherapy for ED symptoms. Clinicians should understand the experiences that individuals have with regard to their various identities and how this may affect eating disorder symptoms. Providing adaptive coping and social resources may help clients manage discrimination that they are experiencing

and reduce ED symptoms (Mason et al., 2018; 2019). In addition, given stigma associated with EDs, particularly among men, it is critical to assess individuals with stigmatized identities for ED symptoms. To implement the aforementioned clinical implications, it is critical to increase healthcare providers' cultural competence in working with stigmatized individuals, and thus, more diversity training for professionals who treat EDs is needed.

In conclusion, this meta-analytic review found that discrimination was related to ED psychopathology across a range of types of discrimination and ED symptoms. Discrimination may be important factor that explains risk for EDs in marginalized populations and could explain why some marginalized groups have elevated ED symptoms compared to their counterparts. Further, this review revealed that weight discrimination is more strongly related to ED outcomes compared to other types of discrimination, and thus may be an important driver of EDs in combination with the experience of other types of discrimination. Finally, men and college students may have stronger associations between discrimination and some types of symptoms.

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Table 1.
Overall effect sizes and heterogeneity statistics

		Effect size and 95% interval					Heterogeneity statistics			
Combined discrimination	Number of studies	*r*	Lower CI	Upper CI	*Z*	*p*	*Q*	df (Q)	*p*	I^2
Combined ED	55	0.25	0.22	0.29	12.90	0.000	532.73	54	.00	89.86
General/global ED	27	0.26	0.21	0.31	10.06	0.000	183.85	26	.00	85.86
Body dissatisfaction	36	0.25	0.20	0.30	9.25	0.000	392.32	35	.00	91.08
Binge eating	15	0.25	0.19	0.31	7.96	0.000	101.41	14	.00	86.19
Restraint	4	0.17	0.13	0.20	8.85	0.000	3.52	3	.32	14.71
Other	5	0.20	0.12	0.27	5.00	0.000	11.18	4	.03	64.22
General discrimination										
Combined ED	7	0.26	0.17	0.34	5.76	0.000	23.62	6	.001	74.60
General/global ED	4	0.31	0.26	0.36	12.03	0.000	6.90	3	.08	56.52
Body dissatisfaction	5	0.25	0.09	0.40	3.09	0.002	41.69	4	.000	90.40
Binge eating	3	0.19	0.13	0.25	6.10	0.000	0.73	2	.69	0.00
Restraint	1	0.36	0.19	0.51	3.90	0.000	-	-	-	-
Other	1	0.18	-0.01	0.36	1.88	0.060	-	-	-	-
Racial discrimination										
Combined ED	9	0.18	0.11	0.24	5.11	0.000	21.66	8	0.01	63.07
General/global ED	5	0.17	0.07	0.27	3.27	0.001	15.85	4	0.003	74.76
Body dissatisfaction	6	0.17	0.06	0.27	3.02	0.002	23.26	5	0.00	78.50
Binge eating	2	0.21	0.11	0.30	4.05	0.000	1.09	1	0.30	8.30
Restraint	1	0.29	0.08	0.47	2.71	0.007	-	-	-	-
Other	2	0.15	0.05	0.24	3.01	0.003	0.61	1	0.43	0.00
Gender discrimination/sexual harassment										
Combined ED	13	0.19	0.16	0.22	11.27	0.000	18.96	12	0.10	36.71
General/global ED	10	0.22	0.16	0.28	6.87	0.000	34.76	9	0.00	74.11

Body dissatisfaction	10	0.17	0.13	0.21	8.29	0.000	14.29	9	0.11	37.02
Binge eating	1	0.33	0.28	0.39	11.04	0.000	-	-	-	-
Restraint	1	0.16	0.09	0.21	5.00	0.000	-	-	-	-
Other	1	0.29	0.23	0.34	9.38	0.000	-	-	-	-
LGBT										
Combined ED	11	0.20	0.09	0.30	3.62	0.000	87.82	10	0.00	88.61
General/global ED	5	0.29	0.09	0.47	2.77	0.006	64.38	4	0.00	93.79
Body dissatisfaction	8	0.14	0.05	0.23	3.13	0.002	30.45	7	0.00	77.01
Binge eating	2	0.08	0.00	0.16	1.98	0.048	2.10	1	0.15	52.31
Restraint	0	-	-	-	-	-	-	-	-	-
Other	1	0.12	0.01	0.23	2.09	0.036	-	-	-	-
Weight										
Combined ED	20	0.34	0.27	0.40	9.32	0.000	314.61	19	0.00	93.96
General/global ED	8	0.33	0.22	0.42	6.04	0.000	61.90	7	0.00	88.69
Body dissatisfaction	12	0.39	0.35	0.43	15.99	0.000	39.13	11	0.00	71.89
Binge eating	8	0.29	0.19	0.37	5.87	0.000	74.93	7	0.00	90.66
Restraint	2	0.16	0.12	0.21	6.82	0.000	1.40	1	0.24	28.41
Other	1	0.22	0.12	0.31	4.36	0.000	-	-	-	-

Note. ED = eating disorder. Combined ED refers to the aggregation of all ED effect sizes (i.e., general ED, body dissatisfaction, binge eating, restraint, and other).

Table 2.
Univariate random effects meta-regression models assessing study-level characteristics as predictors of effect sizes

Effect	Covariate	Level	Reference category	*B*	*SE*	Lower CI	Upper CI	Z	*p*	*Q*	*p*	R^2 analog
Combined discrimination and combined ED	Age	--	--	<-0.01	<0.01	-0.01	<0.01	-1.34	0.179	1.81	0.179	<0.01
	Gender	--	--	<0.01	<0.01	<-0.01	<0.01	0.67	0.502	0.45	0.502	0.04
	Population	Community	College	-0.02	0.04	-0.11	0.07	-0.42	0.673	0.89	0.642	<0.01
		Other	College	0.05	0.07	-0.10	0.19	0.62	0.535			
	Publication year	--	--	0.01	<0.01	<-0.01	0.02	1.75	0.081	3.05	0.081	0.04
Combined discrimination and general ED	Age	--	--	-0.01	0.01	-0.02	0.01	-0.88	0.377	0.78	0.377	<0.01
	Gender	--	--	**<-0.01**	**<0.01**	**-0.01**	**<-0.01**	**-2.06**	**0.040**	**4.24**	**0.040**	**<0.01**
	Population	Community	College	0.01	0.06	-0.10	0.12	0.15	0.880	0.97	0.615	<0.01
		Other	College	-0.13	0.14	-0.42	0.15	-0.92	0.357			
	Publication year	--	--	0.01	0.01	<-0.01	0.02	1.14	0.253	1.31	0.253	<0.01
Combined discrimination and body dissatisfaction	Age	--	--	<-0.01	<0.01	-0.01	0.01	-0.85	0.398	0.72	0.398	<0.01
	Gender	--	--	<0.01	<0.01	<-0.01	<0.01	0.89	0.373	0.79	0.373	0.08
	Population	Community	College	0.03	0.06	-0.09	0.15	0.47	0.638	2.79	0.248	0.03
		Other	College	0.16	0.10	-0.03	0.35	1.65	0.100			
	Publication year	--	--	0.01	0.01	<-0.01	0.02	1.32	0.187	1.74	0.187	0.07

Combined discrimination and binge eating	Age	--	--	<-0.01	<0.01	-0.01	<0.01	-0.92	0.360	0.84	0.360	0.23
	Gender	--	--	<-0.01	<0.01	<-0.01	<0.01	0.86	0.389	0.74	0.389	0.23
	Population	**Community**	**College**	**-0.14**	**0.06**	**-0.25**	**-0.03**	**-2.50**	**0.013**	**6.41**	**0.041**	**0.46**
		Other	College	-0.06	0.09	-0.23	0.12	-0.64	0.520			
	Publication year	--	--	0.01	0.01	-0.02	0.03	0.67	0.505	0.44	0.505	<0.01
Gender discrimination/sexual harassment and general ED	Age	--	--	<-0.01	0.01	-0.01	0.01	-0.23	0.821	0.05	0.821	<0.01
	Gender	--	--	<-0.01	<0.01	<-0.01	<0.01	-0.92	0.357	0.85	0.357	0.16
	Population	Community	College	-0.04	0.08	-0.18	0.11	-0.48	0.632	0.96	0.617	<0.01
		Other	College	-0.12	0.12	-0.36	0.12	-0.97	0.334			
	Publication year	--	--	0.01	0.01	-0.01	0.02	0.88	0.377	0.78	0.377	0.32
LGBT discrimination and combined ED	Age	--	--	-0.01	0.02	-0.04	0.03	-0.47	0.635	0.22	0.635	<0.01
	Gender	--	--	<-0.01	<0.01	<-0.01	<0.01	-0.21	0.833	0.04	0.833	<0.01
	Population	Community	College	[a]								
		Other	College	[a]								
	Publication year	--	--	0.01	0.02	-0.02	0.04	0.58	0.561	0.34	0.561	<0.01
Weight discrimination and combined ED	Age	--	--	-0.01	<0.01	-0.01	<0.01	-1.35	0.178	1.81	0.178	0.26
	Gender	--	--	<0.01	<0.01	<-0.01	<0.01	0.75	0.451	0.57	0.451	0.36
	Population	Community	College	-0.02	0.09	-0.19	0.15	-0.21	0.836	0.04	0.979	<0.01
		Other	College	-0.01	0.11	-0.23	0.21	-0.08	0.935			

	Publication year	--	--	0.01	0.01	-0.01	0.02	0.54	0.589	0.29	0.589	0.01
	BMI	--	--	<-0.01	<0.01	-0.01	0.01	-0.62	0.537	0.38	0.537	<0.01
	Age	--	--	<-0.01	<0.01	-0.01	<0.01	-0.35	0.728	0.12	0.728	<0.01
Weight discrimination	Gender	--	--	<-0.01	<0.01	<-0.01	<0.01	-0.41	0.685	0.16	0.685	<0.01
and body dissatisfaction	Population	Community	College	0.09	0.07	-0.05	0.23	1.29	0.199	1.79	0.408	<0.01
		Other	College	0.05	0.08	-0.11	0.21	0.60	0.548			
	Publication year	--	--									
	BMI	--	--	<-0.01	<0.01	-0.01	<0.01	-0.69	0.493	0.47	0.493	<0.01

Note. CI=95% confidence interval; BMI=body mass index. Gender was coded as percentage of female participants within the study.
[a] Insufficient between-study variance in population types to assess moderating effects.

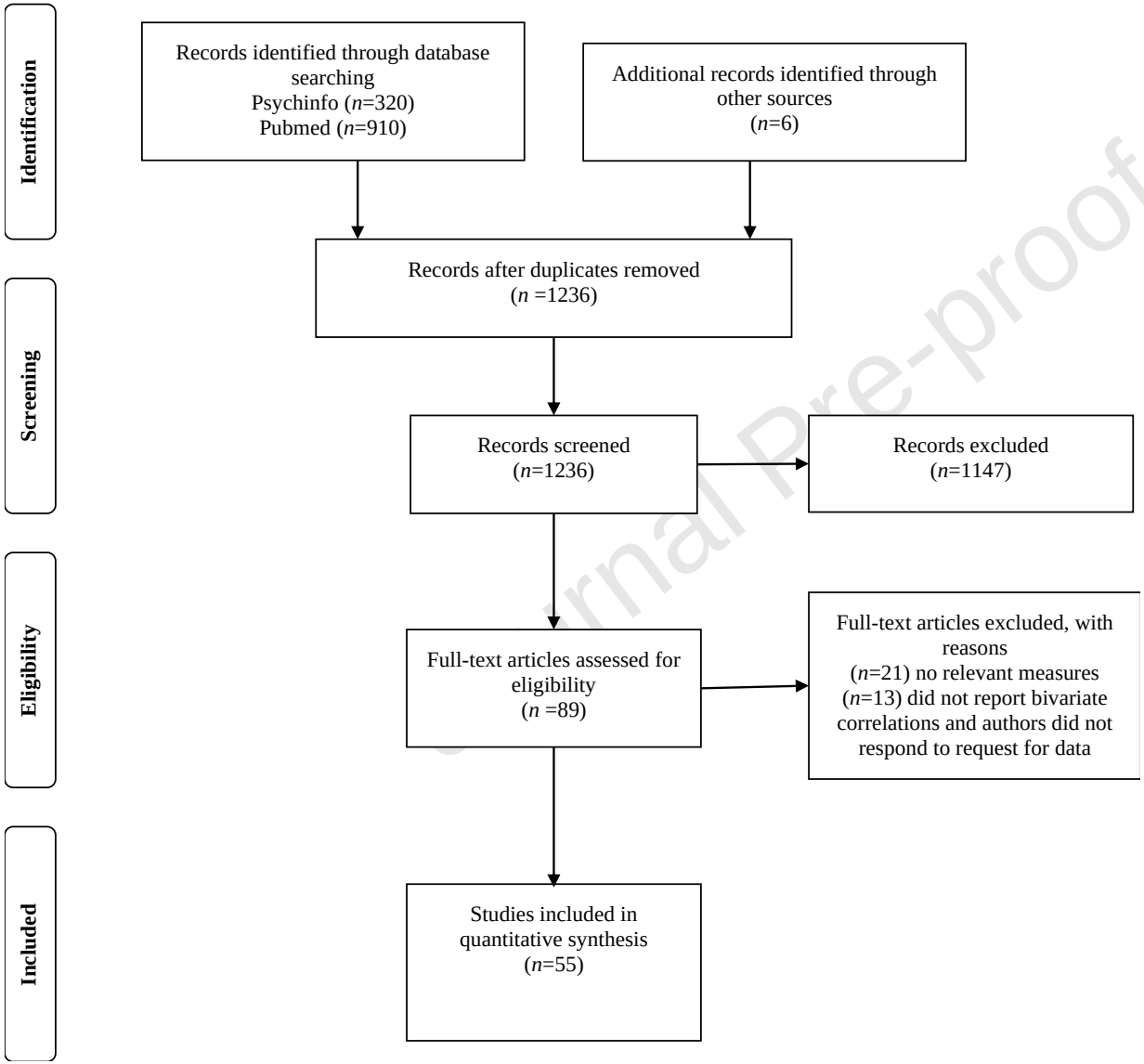

Figure 1. PRISMA flow diagram of paper selection.

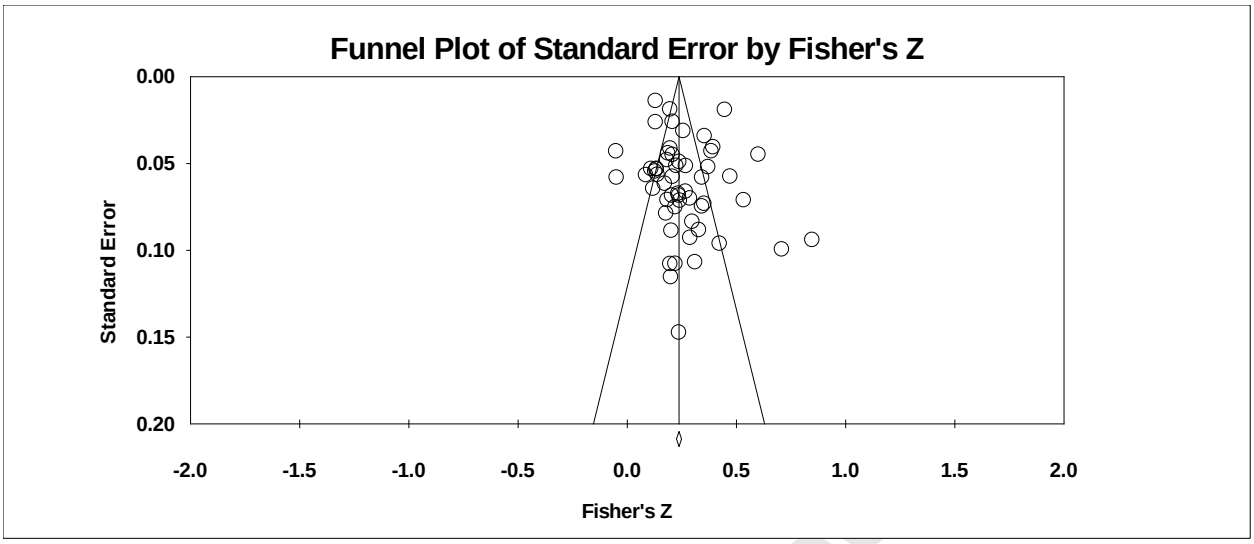

Figure 2. Funnel plot

Highlights

- A meta-analysis of discrimination and eating disorder (ED) pathology was conducted.
- There was a small-to-medium association between discrimination and ED pathology.
- Effects were generally larger for weight discrimination.
- Discrimination may represents a contributory factor related to ED pathology.