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Commentary on Empirical Examinations of the Association between Anxiety and Eating Disorders

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Abstract

A substantial body of research supports comorbidity between eating and anxiety disorders, and articles in this special section explore the nature of this association using severity different research designs. This commentary reviews findings from these articles included, focusing on inferences that may be drawn from each design. Collectively, articles support the need for future studies to examine whether eating and anxiety disorders share underlying mechanisms. If identified, such mechanisms could create opportunities for transdiagnostic interventions that ameliorate suffering from both eating and anxiety disorders

Commentary on Empirical Examinations of the Association between Anxiety and Eating Disorders

I had the pleasure of reading the articles for this special section of *Cognitive Therapy and Research* on my flights to and from the 2013 International Conference on Eating Disorders in Montreal. Professor David Barlow provided the keynote address at this year's meeting, "Crossing Boundaries: What Can We Learn from Therapeutic Approaches to Neuroticism?" and presented on the value of transdiagnostic approaches in the treatment of anxiety disorders. Within his talk, Dr. Barlow offered the suggestion that interventions designed to address core problems related to a range of anxiety disorders might be extended to the treatment of eating disorders. For such approaches to be effective, however, there must be evidence of shared mechanisms that contribute to the risk for development or maintenance of anxiety and eating disorders. This provided a unique backdrop for reflecting on the timeliness of this special section, as the papers address the overlap between anxiety and eating disorders using a variety of designs.

Specific designs are required to evaluate whether factors represent correlates, risk factors, or causal risk factors for illness. Among the cross-sectional studies examining correlations among factors that may contribute to both anxiety and eating disorders, Hearon and colleagues (in press) measured how anxiety sensitivity and eating expectancies are related to self-reported emotional eating and to actual caloric consumption following a stressor. A key advantage of this approach is the examination of eating via self-report and behavioral observations. While all self-report measures were significantly correlated with one another in expected directions, actual food intake was predicted by a 3-way interaction for body mass index (BMI), the expectancy that eating would lead to a sense of loss of control, and anxiety sensitivity to fear of losing control. However, because of the cross-section design, it is difficult to disentangle cause and effect. One interpretation is that individuals who have higher anxiety sensitivity surrounding a fear of losing control, expect eating to feel out of

control, and have higher BMI (suggesting a pattern in which energy consumption exceeds energy needs) are at greatest risk for excessive food consumption – a factor related to risk for obesity and binge eating. It also seems plausible that individuals who consume more food and are heavier may be endorsing that they experience their eating as being out of control and are sensitive to these experiences. Thus, these findings may elucidate how eating is experienced, particularly among individuals with higher body weight. Longitudinal studies would be useful in understanding whether anxiety sensitivity prospectively predicts later development of eating expectancies, altered food intake, and changes in body weight.

Fink and colleagues (in press) also examined the associations between anxiety sensitivity and disordered eating, focusing on how anxiety sensitivity to physical concerns might moderate the association between acquired capability for suicide and eating disorder severity among female outpatients. A strength of this study is its transdiagnostic approach in a clinical sample. Although anxiety sensitivity surrounding physical concerns was positively associated with eating disorder severity, and eating disorder severity was positive correlated with acquired capability for suicide, anxiety sensitivity for physical concerns was negatively associated with acquired capability for suicide. In addition, eating disorder severity was only associated with acquired capability for suicide in those with low anxiety sensitivity for physical concerns. This led to the conclusion that although higher anxiety sensitivity (including that for physical concerns) appears to be linked to eating disorders, those with low physical concerns may be at greatest risk for suicide. These results, as well as those from Hearon et al. (in press), support employing a multidimensional assessment of anxiety sensitivity in eating disorder populations as the nature of associations appears to depend on the subdomain of anxiety sensitivity.

Bardone-Cone et al. (in press) conducted a cross-sectional study investigating whether the association between anxiety and disordered eating (measured as global disordered eating, dietary restriction, and binge eating) is moderated by appearance-based self worth and appearance-based conversations. For global disordered eating and dietary restriction, a two-way interaction of anxiety and appearance-based self-worth was significant. Diagnostic criteria for anorexia nervosa and bulimia nervosa include the undue influence of weight or shape on self-evaluation (American Psychiatric Association 2000), and these analyses suggest that individuals who endorse high appearance based self-worth are most likely to demonstrate significant associations between anxiety and dietary restraint and overall disordered eating. In contrast, for binge eating, the 3-way interaction was supported, suggesting that significant associations between anxiety and binge eating are observed in individuals who endorse high appearance based self-worth and also experience an environment with a high frequency of appearance based conversations. These findings underscore the potential value of peer-based interventions for both reducing internalization of the thin ideal and combating messages in the social environment that reinforce this ideal (Keel and Forney 2013).

While other cross-sectional studies focused on moderation of associations with eating disorders or disordered eating, both Menatti and colleagues (in press) completed a cross-sectional study examining whether perfectionism mediates associations between social anxiety domains and bulimic symptoms (while controlling for body image variables), and Egan and colleagues (in press) completed a cross-sectional study to examine whether anxiety mediated the association between anxiety and eating pathology in a clinical sample. For fear of public scrutiny, perfectionism fully mediated the relationship with bulimic symptoms. Interestingly, fear of public scrutiny did not mediate the association between perfectionism and bulimic symptoms, supporting the authors' model for the direction of associations. For anxiety over social interactions, perfectionism partially mediated the association with bulimic symptoms. In contrast to these findings, Egan et al. (in press) found

that anxiety did partially mediate the association between self-oriented perfectionism and eating disorder psychopathology in a sample of 370 eating disorder patients. Differences may be explained by differences in the aspect of perfectionism measured. Menatti et al. (in press) focused on Maladaptive Evaluative Concerns (not pure personal standards, which were not significantly associated with either measure of social anxiety) whereas Egan et al. (in press) focused on self-oriented perfectionism. Bardone-Cone et al. (in press), Menatti et al. (in press), and Egan et al. (in press) discuss their findings in the context of Heatherton and Baumeister's (1991) theory of binge eating as an escape from self-awareness. For individuals who are high in anxiety, base self-worth on their appearance, and encounter social messages regarding their appearance, binge eating would not help them attain the thin ideal and may instead be used to temporarily escape from feelings of inadequacy. Similarly, for individuals whose fear of public scrutiny and insecurity in social situations contributes to elevated levels of perfectionism in order to be deemed acceptable, binge eating and bulimic symptoms may be an attempt to escape from the pressure they place themselves under to achieve unrealistic ideals. Finally, for individuals whose high self-oriented perfectionism contribute to elevated anxiety, binge eating may facilitate a cognitive narrowing that reduces anxiety by allowing individuals to temporarily escape awareness of their high personal standards. While several studies support the prospective influence of body image, peer context, and perfectionism on the development of bulimic symptoms (Keel and Forney 2013), longitudinal studies examining the roles of anxiety and domains of social anxiety are clearly warranted to decrease ambiguity regarding the direction of associations.

Family study designs represent a special type of cross-sectional study as certain factors may be controlled to a greater degree than in a typical cross-sectional design. This special section includes two family studies, one using family as a control for genetic influences in order to more closely examine subtle differences in rearing environment (Taborelli et al. in press) and the other using the family design to better understand intermediate phenotypes that may demonstrate more robust associations with genetic risk loci (Goddard and Treasure in press). Taborelli et al. (in press) examined self-reported shyness, separation anxiety, harm avoidance, and obtained parental reports of prenatal anxiety and earliest age at which children were left with someone else (as an indicator of maternal overprotectiveness) for sibling pairs discordant for an eating disorder. A strength of this design is the use of unaffected sisters as controls in comparison of factors that may uniquely contribute to risk for developing anorexia nervosa or bulimia nervosa. Patients with eating disorders, regardless of specific diagnosis, endorsed increased childhood separation anxiety as well as differences on harm avoidance compared to their unaffected sisters. However, maternal report of prenatal anxiety and indicators of possible maternal overprotectiveness differed only between women with anorexia nervosa and their sisters, leading the authors to suggest a unique association between anxiety and risk for developing anorexia nervosa. In contrast, the report by Goddard and Treasure (in press) suggests that trait anxiety may represent an intermediate phenotype for eating disorders, with effects evident across eating disorder diagnoses. These authors recruited family trios (an offspring and both her parents) in which the offspring either had an eating disorder or was a healthy control. Trait anxiety, social anxiety, and emotional processing difficulties were examined for evidence that they might serve as intermediate phenotypes by meeting the following criteria: association with illness, independent of illness state, association with the illness in family members (co-segregation), present in never-ill family members, and heritable. Trait anxiety was elevated in eating disorder offspring relative to healthy control offspring, parents of eating disorder offspring who themselves had eating disorders, and non-eating disordered parents of eating disorder offspring relative to parents of healthy controls – suggesting that this may be an intermediate phenotype. Social anxiety was elevated in eating disorder offspring and parents who also suffered from eating disorders but was not elevated in non-eating disordered parents of eating disorder offspring. Finally, behavioral tasks designed to measure problems with social

anxiety or emotional processing did not detect differences between offspring with or without eating disorders and thus failed to be associated with the presence of an eating disorder. Based on these findings, trait anxiety may be explored as an intermediate phenotype in studies seeking genetic risk loci for eating disorders. Heritable elevations in trait anxiety also may contribute to expression of anxiety in the prenatal and early rearing environment of individuals who go on to develop anorexia nervosa but not their sisters, for reasons that are not entirely clear. Greater information on factors that contribute to differences in rearing environment among siblings (and twins) reared together would be valuable, as these would contribute to non-shared environment, which represents a significant source of variance in twin studies of eating disorders (Trace et al. 2013).

Although cross-sectional designs do not permit conclusions regarding direction of associations or causation they do reveal which factors merit the investment of time and resources into longitudinal and experimental designs. Moreover, these designs are warranted when independent investigations point to consistent cross-sectional associations between a posited mechanism and pathology. Across the cross-sectional studies included in this special issue, trait anxiety, social anxiety and facets of anxiety sensitivity emerge as factors that, pending independent replication, may warrant investigation in more resource-intensive designs.

Importantly, Deboer and Smits (in press) contribute a longitudinal study to this special issue to evaluate whether fear of negative evaluation (FNE) is a prospective risk factor for changes in thin ideal internalization, body dissatisfaction, restraint, disordered eating, and negative affect. Although this study did not include perfectionism, the examination of FNE closely aligns with Menatti et al.'s (in press) examination of fear of public scrutiny in relation to bulimic symptoms. Results supported bi-directional associations but more robustly supported that disordered eating variables predicted FNE vs. FNE predicting disordered eating variables. For example, FNE predicted greater thin ideal internalization among those with elevated BMI whereas greater thin ideal internalization predicted greater FNE across the weight spectrum. Similarly, greater dietary restraint predicted greater FNE whereas FNE did not predict greater dietary restraint. The authors note that the direction of associations (with indicators of disordered eating reliably predicting FNE) may reflect that analyses were conducted in a group receiving an intervention to decrease thin ideal internalization. If true, then results suggest that such interventions may be effective for reducing disordered eating levels and a domain of social anxiety. This raises the interesting possibility that interventions designed to address core problems related to a range of eating disorders may be effective in reducing anxiety disorders (or at least social anxiety disorder).

Because anxiety disorders are defined by a dysregulation of emotion and eating disorders are defined by a dysregulation of eating behavior (and there is a tendency to see emotions as triggering and maintaining behaviors), it may be tempting to consider anxiety disorders (and their risk factors) as contributing to the development and maintenance of eating disorders. However, as noted above, cross-sectional designs do not address the direction of associations. Moreover, behaviors contribute to changes in emotions, with avoidance behaviors having a particularly powerful effect on anxiety. Thus, it may be that eating disorders (and their risk factors) contribute to the development and maintenance of anxiety disorders. Risk and maintenance factors for eating disorders include weight concerns, dietary restraint, and friends' dieting and bulimic symptoms, and these could be examined for their influence on the development and maintenance of anxiety disorders as any of these may contribute to gender differences in risk for anxiety disorders. Finally, both eating and anxiety disorders may share a diathesis with neither serving as the "primary" disorder, as supported by a study of monozygotic (MZ) twins (Keel et al. 2005). Across 672 female MZ twins, anxiety disorders were associated with eating disorders. In MZ twin pairs discordant

for eating disorders, risk for anxiety disorders was elevated in unaffected co-twins, even when the proband did not herself have an anxiety disorder. Similarly, in MZ twin pairs discordant for an anxiety disorders, risk for eating disorders was elevated in unaffected co-twins, even when the proband did not herself have an eating disorder. This provides strong evidence for shared underlying mechanisms for the development of eating and anxiety disorders (Keel et al. 2005), and the studies in this special issue provide an opportunity for readers to explore a range of possible shared mechanisms worthy of further investigation.

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