



Shorter communication

Biological or psychological? Effects of eating disorder psychoeducation on self-blame and recovery expectations among symptomatic individuals



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ABSTRACT

Recent years have witnessed increasing popularity and promotion of biological influences (e.g., genetics) in eating disorder (ED) development. Although research suggests biological models of EDs reduce blame-oriented stigma in the general public, their effect on symptomatic individuals' attitudes toward themselves, treatment, and their prognosis has not been studied. Additionally, little is known about how other credible forms of conceptualizing ED development (e.g., cognitive-behavioral) affect individuals with disordered eating. Accordingly, the present study assessed the effects of three different forms of psychoeducation about ED development (biology-only, malleability of biology, cognitive-behavioral) among a sample high in ED symptoms. Participants ($N = 216$) viewed an audiovisual presentation describing ED development from one of the three perspectives before completing measures of self-blame for symptoms, prognostic expectations, self-efficacy in recovering, and attitudes toward a description of cognitive-behavioral therapy. There were no significant differences between conditions in self-blame. Relative to biology-only, the psychoeducational messages emphasizing malleable biology and cognitive-behavioral factors produced more prognostic optimism and self-efficacy in recovering. Perceived credibility of cognitive-behavioral therapy and expectations for its efficacy were highest in the cognitive-behavioral psychoeducation condition. Implications for efforts to educate the public and treatment-seeking individuals about the nature of EDs are discussed.

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Individuals with eating disorders (EDs) are subject to high levels of volitional stigma (i.e., blame) from both the general public and themselves (Easter, 2012). Research shows that people with EDs are blamed more for their condition than people with other mental disorders (e.g., Crisp, 2005). Commonly endorsed beliefs about people with EDs include that they could simply “pull themselves together” if desired and are at fault for their problem due to vanity and attention-seeking (Crisp, 2005). Importantly, ED sufferers likely hold *self*-blaming attitudes, as public stigma is often internalized by individuals with mental disorders (Corrigan, Watson, & Barr, 2006). Indeed, individuals with EDs endorse a relatively high degree of personal control over the development of their disorder (Holliday, Wall, Treasure, & Weinman, 2005), suggesting that they

often blame themselves for having an ED.

Experiencing high levels of blame from themselves and others is a significant barrier to ED sufferers accessing treatment. To illustrate, previous work has shown that endorsement of self-blaming attitudes, coupled with expectations of blame from others, discourages ED sufferers from pursuing treatment (Hepworth & Paxton, 2007). Further, people with EDs are often unable to obtain insurance coverage for treatment (Becker, Arrindell, Perloe, Fay, & Striegel-Moore, 2010), which may be due in part to blame-related attitudes among policymakers (Klump, Bulik, Kaye, Treasure, & Tyson, 2009).

Aiming in part to address ED sufferers' difficulties with obtaining insurance coverage for treatment, experts have attempted to underscore the severity of EDs by highlighting their biological underpinnings and calling for their promotion as “biologically-based mental illnesses” (e.g., Klump et al., 2009), a position that has been adopted by several ED advocacy groups. For example, the

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website of Families Empowered and Supporting Treatment of Eating Disorders (FEAST) claims that EDs are an “inherited illness” in which “brain chemistry, function, and structure are altered” (FEAST, 2012). Although some research suggests that biologically-based conceptions of EDs reduce blame assigned to sufferers by the general public (e.g., Crisafulli, Von Holle, & Bulik, 2008), little is known about how these conceptions affect self-blame among individuals with disordered eating. One qualitative study suggested that although biologically-based conceptions of EDs may reduce blame among sufferers, they may also reduce prognostic optimism and self-efficacy in recovery (Easter, 2012). However, the effect of biologically-based conceptions on ED sufferers' self-blame and recovery-related expectations has yet to be empirically assessed.

Findings from research assessing how biologically-based explanations influence self-blame among other mental disorders are mixed. To illustrate, whereas Lebowitz, Pyun, and Ahn (2014) found that biologically-based psychoeducation reduced self-blame relative to no psychoeducation among anxious individuals, this finding was not replicated among depressed individuals (Kemp, Lickel, & Deacon, 2014). Although the influence of biological explanations on self-blame is unclear, a growing body of literature has demonstrated that biological accounts of mental disorders are associated with important disadvantages among symptomatic individuals (Lebowitz, 2014). For example, biological attributions of psychopathology have been shown to cause prognostic pessimism, low perceived control over symptoms, diminished self-efficacy in recovery, and reduced perceived efficacy of psychological treatments (Kemp et al., 2014; Lebowitz, Ahn, & Nolen-Hoeksema, 2013; Lebowitz et al., 2014). Based on the consistency of research findings among anxious and depressed individuals (Lebowitz, 2014), it is possible the detrimental effects of biological models on improvement-related expectancies apply to individuals with ED symptoms. If evident, such lowered expectancies would be particularly problematic given the efficacy of psychological treatments for EDs (Hay, Bacaltchuk, Stefano, & Kashyap, 2009) and the established relationship between expectancies and treatment outcome (e.g., Rutherford, Wager, & Roose, 2010). Thus, it is important to explore alternative, credible ways of educating ED sufferers on the development of their symptoms.

One alternative to traditional biological conceptions of psychopathology is to emphasize the malleability of biological factors. Lebowitz et al. (2013) compared a psychoeducation intervention emphasizing only biological variables (e.g., genetic, biochemical) to psychoeducation stressing the *malleability* of biological factors (e.g., epigenetic effects) among depressed participants. Relative to the biology-only explanation, the malleable biological explanation produced significantly higher prognostic expectations and self-efficacy in overcoming depression. A follow-up study (Lebowitz & Ahn, 2015) found that malleability-focused psychoeducation reduced prognostic pessimism and increased self-efficacy among individuals who believed biological factors played a major role in their levels of depression. These benefits were maintained at six-week follow-up.

An additional alternative to traditional biological models is to emphasize empirically supported psychological factors, such as cognitive (e.g., body image concerns) and behavioral (e.g., dietary restriction) factors emphasized in cognitive-behavioral transdiagnostic ED models (e.g., Fairburn, Cooper, & Shafran, 2003). The effect of cognitive-behavioral conceptions of EDs on self-blame and prognostic expectations warrants examination for several reasons. First, individuals with EDs tend to strongly endorse cognitive-behavioral factors as being responsible for their ED development (Holliday et al., 2005). Second, research has demonstrated a high level of empirical support for cognitive-behavioral models of ED development that emphasize maladaptive beliefs concerning the importance of weight and subsequent efforts to control weight

(Fairburn et al., 2003). Third, cognitive-behavioral therapy (CBT) has demonstrated efficacy as a transdiagnostic intervention for ED-related pathology (e.g., Fairburn et al., 2009) and is a recommended first-line intervention for eating disorders in clinical practice guidelines (National Institute for Clinical Excellence [NICE], 2004). It is conceivable that cognitive-behavioral conceptions of EDs may facilitate especially favorable attitudes toward CBT among sufferers.

The present study was conducted to compare the effects of biological, malleable biology, and cognitive-behavioral models of EDs on individuals with disordered eating. A community sample of highly ED-symptomatic individuals were randomly assigned to view one of the three psychoeducational messages before completing measures of self-blame, prognostic expectations, self-efficacy in overcoming symptoms, and attitudes toward a description of CBT for EDs. We hypothesized that the two psychoeducation conditions stressing the role of biology in EDs would produce lower self-blame than cognitive-behavioral psychoeducation. Additionally, we predicted that compared to psychoeducation emphasizing only biology, the two alternative forms of psychoeducation would produce more favorable prognostic expectations and self-efficacy in overcoming symptoms. Finally, we predicted that the cognitive-behavioral psychoeducation would yield greater perceived credibility and expected efficacy of CBT.

1. Method

1.1. Participants

Participants ($N = 216$) were U.S. residents recruited via Amazon.com's Mechanical Turk (MTurk, <http://www.mturk.com>), an online labor market where individuals complete tasks for small monetary compensation. Compared to university-based samples, MTurk offers researchers better sampling diversity, better representation of the U.S. population, and at least equivalent reliability and validity of data (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). Additionally, MTurk has shown to be a useful recruitment source for studying individuals with psychiatric symptoms (Shapiro, Chandler, & Mueller, 2013).

Respondents who endorsed any history of treatment for an ED were excluded. Given the empirical support for transdiagnostic conceptualizations of ED pathology (Fairburn, 2008), we screened individuals using the Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 2008), a measure that assesses global ED symptoms as opposed to disorder-specific features. Following the recommendations of Mond, Hay, Rodgers, Owen, and Beumont (2004) for screening for EDs in community samples, respondents who scored above 2.3 on the EDE-Q global scale and reported an occurrence in the past four weeks of either: (a) an objective bulimia episode (i.e., binge eating followed by compensatory strategies) or (b) driven/compulsive exercising as a means of controlling weight/shape (though not specifically related to binge eating) were invited to participate. Of the 1127 individuals screened, 239 met criteria and initiated the study. Fifteen of these cases were removed due to incomplete data and eight were removed after incorrectly answering a basic multiple-choice question about the information presented during psychoeducation. The final sample consisted of 216 participants ($M_{\text{age}} = 33.9$ years, 76.9% female, 74.5% Caucasian). Most reported either completing some college (37.0%) or earning their baccalaureate degree (31.0%). All participants received \$1.50 upon completion of study procedures.

1.2. Measures

1.2.1. Eating disorder examination questionnaire – version 6.0 (EDE-Q)

The EDE-Q (Fairburn & Beglin, 2008) is a widely used and well-

established measure of eating disorder-related pathological features. It is a 28-item questionnaire that assesses 22 ED-related attitudinal features (e.g., weight concerns) and six ED-related behaviors (e.g., purging). Participants use a scale ranging from 0 (*no days*) to 6 (*every day*) to indicate the frequency of experiencing each item (e.g., “Have you had a definite fear of losing control over eating?”) during the past four weeks. The EDE-Q has previously demonstrated excellent psychometric properties in both clinical and nonclinical samples (Mond et al., 2004). In the present study, the EDE-Q was used to assess baseline ED severity and demonstrated excellent internal consistency ($\alpha = .90$).

1.2.2. Attitudes toward eating disorder symptoms (AEDS)

The AEDS was an adapted version of Lebowitz et al. (2013) measure of participants' attitudes toward their depressive symptoms; it was modified for the present study to reflect attitudes toward one's ED symptoms. Self-blame for ED symptoms was assessed via the following two items: (a) “I think it is my own fault that I currently experience eating disorder symptoms” (1 = *not at all*, 9 = *very much*), and (b) “How personally responsible do you think you are for your eating disorder symptoms?” (1 = *not at all*, 9 = *very much*). These two items were highly correlated in the present study ($r = .66$, $p < .001$) and were therefore aggregated to create a total self-blame score for each participant. Prognostic expectations were assessed with one item measuring perceived symptom immutability (“How long do you think you will continue to experience eating disorder symptoms?”) on a 1 (*less than one week*) to 9 (*indefinitely*) scale and another item measuring predicted likelihood (0–100%) of symptom remission. To assess self-efficacy for overcoming ED symptoms, participants used a 1 (*completely disagree*) to 7 (*completely agree*) scale to respond to the following two items: (a) “I am able to overcome my eating disorder symptoms” and (b) “There are things I can do to eliminate my eating disorder symptoms.” Responses to these two items ($r = .59$, $p < .001$) were aggregated. Finally, participants' perceived ability to control their ED symptoms was assessed (“How controllable do you think your eating disorder symptoms are?”) using a 1 (*not at all*) to 9 (*completely*) scale.

1.2.3. Credibility/expectancy questionnaire (CEQ)

The CEQ (Deville & Borkovec, 2000) is a six-item measure of treatment credibility and expectancy that has demonstrated good internal consistency and test-retest reliability. Following a description of CBT (see below), participants indicated their perceived credibility (e.g., “At this point, how logical does the therapy offered to you seem?”) and expected efficacy (e.g., “By the end of the therapy period, how much improvement in your symptoms do you think will occur?”). In the present study, credibility and expectancy subscale totals were derived using the scoring procedure established by Nock, Ferriter, and Homburg (2007). Items 4 and 6, which were scored on an 11-point scale (0–100%), were recoded to conform to the 9-point scale used with items 1, 2, 3, and 5. Specifically, for items 4 and 6, values in the 40–60% range were collapsed into one value (i.e., 50%). Thus, each subscale had a range from 3 to 27, with high scores indicative of greater perceived credibility or expected efficacy of CBT for EDs. Both the credibility ($\alpha = .88$) and expectancy ($\alpha = .89$) subscales demonstrated good internal consistency.

1.3. Procedure

1.3.1. Screening phase

Informed consent was obtained via participants providing their electronic signature. All respondents who initiated the screening phase of the study completed the EDE-Q and two items assessing

ED diagnostic and treatment history. Only respondents who met EDE-Q study criteria and did not endorse ED treatment history were invited to continue the study. Eligible participants were informed that they “scored significantly higher than average on a measure of eating disorder symptoms” and “may meet diagnostic criteria for an eating disorder.”

1.3.2. Experimental phase

Participants were randomly assigned to one of three conditions that differed by the type of psychoeducation provided concerning the development of EDs; a biological illness condition (BI, $n = 71$) emphasized biological factors (e.g., brain chemistry), a malleable biology condition (MB, $n = 72$) reviewed these same biological factors but stressed their ability to be influenced by environmental events (i.e., epigenetics, Lebowitz et al., 2013), and a cognitive-behavioral condition (CB, $n = 73$) emphasized cognitive-behavioral factors involved in EDs (e.g., body image concerns). Each of the psychoeducational messages was based on empirical research on developmental factors in EDs. Psychoeducation was provided via short audiovisual presentations in which the third author described factors involved in ED development. These presentations were standardized for time length (approximately 3 min).

Next, to ensure comprehension of the psychoeducational message, all participants answered a basic multiple-choice question regarding the central message (e.g., “According to the video, what factors are primarily responsible for the development of eating disorders?”). Participants then completed measures assessing: (a) self-blame for ED symptoms, (b) prognostic expectations, and (c) self-efficacy in overcoming symptoms. Lastly, participants were asked to read a paragraph describing the core therapeutic activities of CBT for EDs (Fairburn, 2008). To illustrate, participants read that the treatment “aims to change the way that individuals think about their weight and shape” and includes “trying feared foods to break unhealthy patterns of dietary restriction.” The description did not explicitly refer to the treatment by name. Participants then completed the CEQ before being debriefed and thanked for participating. Study procedures were approved by an Institutional Review Board. All study materials, including scripts used to create the psychoeducational presentations, are available upon request.

1.3.3. Biological illness (BI) condition

BI psychoeducation promoted EDs as “biologically-based mental illnesses” and reviewed several biological factors involved in ED development. These factors were largely derived from an argument put forth by the Academy for Eating Disorders that reviewed studies on the genetic and neurobiological contributions to EDs (Klump et al., 2009). To illustrate, the psychoeducation explained that “people with eating disorders have functional abnormalities in critical brain areas,” and “genetics are a large part of what puts a person at risk for an eating disorder.”

1.3.4. Malleable biology (MB) condition

Psychoeducation in the MB condition briefly reviewed the same biological factors emphasized in the BI condition. However, following the work of Lebowitz et al. (2013); Lebowitz & Ahn (2015), the presentation also stressed the ability of these biological factors to be altered by environmental influences (e.g., epigenetic effects). For example, it was noted that “the brain is constantly changing because of experiences people have” and “lifestyle factors, such as one's stress levels, affect whether genes related to eating disorders will be turned on.”

1.3.5. Cognitive-behavioral (CB) condition

Psychoeducation in the CB condition entailed a review of

cognitive (e.g., body image concerns) and behavioral (e.g., dietary restriction) factors known to be involved in the development of EDs (e.g., Fairburn et al., 2003). The psychoeducation explained that people with EDs “often judge their self-worth exclusively in terms of their body shape” and “try to restrict their diet and avoid certain foods, which continues to fuel the eating disorder.” Participants were encouraged to view these factors as not being a matter of personal choice that they could simply “snap out of” at their own discretion.

2. Results

2.1. Preliminary analyses

Table 1 presents a summary of demographic variables by condition. There were no significant differences between the three conditions on the demographic variables, including age, gender, ethnicity, and highest level of education (all p 's > .20). A small percentage of the total sample reported having previously received an ED diagnosis (6.9%), and diagnostic history did not differ significantly by condition, $\chi^2(2) = .46, p = .79$. ED symptom severity also did not vary significantly by condition, $F(2, 213) = .11, p = .90$. EDE-Q mean scores were above 4 in all three study conditions, indicating a very high level of ED symptoms in the present sample (Fairburn & Beglin, 2008).

2.2. Self-blame for ED symptoms

Table 2 provides means, standard deviations, and omnibus tests for all primary outcome variables. To assess the effect of psychoeducation condition on self-blame, we conducted a one-way analysis of variance (ANOVA) with self-blame scores as the dependent variable. Contrary to prediction, the omnibus effect was non-significant ($p = .19$), indicating that the psychoeducation conditions did not differ in self-blaming attitudes for ED symptoms.

2.3. Prognostic expectations

To assess the effect of psychoeducation condition on prognostic expectations, we conducted two one-way ANOVAs. The first analysis showed that perceived symptom immutability scores differed significantly between conditions. Consistent with hypotheses, Tukey's HSD tests revealed that perceived symptom immutability was significantly higher in the BI condition than the CB condition ($p = .008, d = .56$). There was no significant difference between the BI and MB conditions ($p = .16, d = .30$), nor was there a significant difference between the CB and MB conditions ($p = .29, d = .25$).

The next one-way ANOVA compared predicted likelihood of ED symptom remission by psychoeducation condition. This analysis revealed a marginally significant omnibus effect of condition ($p = .06$). Although the pattern of means indicated that likelihood

ratings were lower in the BI condition (see Table 2) compared with the other two conditions, these differences did not reach statistical significance (both p 's = .10, both d 's = .34). Likelihood ratings did not differ significantly between the MB and CB conditions ($p = .99, d = .002$).

2.4. Self-efficacy and perceived controllability of symptoms

A one-way ANOVA was conducted with scores for perceived self-efficacy in overcoming ED symptoms as the dependent variable. The effect of psychoeducation condition was significant (see Table 2). Consistent with prediction, Tukey's HSD tests showed that self-efficacy perceptions were significantly lower in the BI condition compared to the MB ($p = .02, d = .44$) and CB conditions ($p < .001, d = .72$). There was not a significant difference in perceived self-efficacy between the MB and CB conditions ($p = .17, d = .34$).

Another one-way ANOVA included scores for perceived control over symptoms as the dependent variable. This analysis revealed significant differences among the three conditions. As hypothesized, Tukey's HSD tests showed that perceived control over symptoms in the BI condition was significantly lower compared to both the MB ($p = .02, d = .43$) and CB ($p = .007, d = .56$) conditions. The MB and CB conditions did not differ significantly on perceived control over ED symptoms ($p = .76, d = .12$).

2.5. CBT credibility and expectancy

Two one-way ANOVAs were conducted to assess the effects of psychoeducation condition on perceptions of CBT credibility and expectancy. The first analysis included CEQ-credibility scores as the dependent variable. There was a significant effect of condition on perceptions of CBT credibility (see Table 2). Consistent with hypotheses, CBT credibility scores in the CB condition were significantly higher than the BI ($p < .001, d = 1.15$) and MB ($p < .001, d = .74$) conditions. Additionally, credibility scores were significantly higher in the MB condition than the BI condition ($p = .05, d = .36$).

The second one-way ANOVA included CEQ-expectancy scores as the dependent variable. The omnibus test demonstrated that psychoeducation condition significantly influenced expectations for CBT effectiveness. As predicted, expectations were significantly higher in the CB condition as compared both to the BI ($p < .001, d = .82$) and MB ($p = .02, d = .47$) conditions. Expectations did not differ significantly between the BI and MB conditions ($p = .09, d = .34$).

3. Discussion

Primarily biological models of EDs that do not emphasize the malleability of biological influences have become increasingly paramount in the scientific community. To illustrate, the Academy for Eating Disorders position paper (Klump et al., 2009) argued that EDs are “... a condition that current medical science affirms is caused by a neurobiological disorder of the brain” (p. 98). Although there are important political and economic advantages to this position, the findings from the current study raise concerns that the predominant biologically-focused narrative of ED development may negatively influence prognosis- and treatment-related expectancies among individuals with disordered eating. Specifically, psychoeducation promoting only biological factors in ED development without mention of their malleability led to lower prognostic expectations and self-efficacy in recovery relative to the two alternative explanations. Additionally, biological psychoeducation did not outperform the alternative explanations with regard to self-

Table 1
Demographic characteristics by psychoeducation condition.

	Psychoeducation condition		
	BI ($n = 71$)	MB ($n = 72$)	CB ($n = 73$)
<i>M</i> age (SD)	34.34 (12.24)	35.42 (12.42)	31.96 (11.52)
% female	74.6%	76.4%	79.5%
% caucasian	70.4%	75.0%	78.1%
% completed college	33.8%	28.4%	32.9%
% diagnosed with ED	7.0%	8.3%	5.5%
<i>M</i> EDE-Q score (SD)	4.16 (1.16)	4.11 (1.15)	4.20 (1.12)

Note. EDE-Q = Eating disorder Examination-questionnaire, BI = Biological illness, MB = Malleable biology, CB = Cognitive-behavioral.

Table 2
Means, standard deviations, and omnibus tests for primary dependent variables.

Dependent variables	Psychoeducation condition						F
	BI (n = 71)		MB (n = 72)		CB (n = 73)		
	M	SD	M	SD	M	SD	
Self-blame for symptoms	11.80	4.25	12.64	4.43	13.32	4.28	2.21
Perceived symptom immutability	6.62	2.56	5.86	2.54	5.25	2.31	5.57*
Predicted likelihood of symptom remission	45.92	29.91	55.85	29.81	55.74	27.12	2.77 ^a
Self-efficacy in overcoming symptoms	10.44	2.91	11.56	2.08	12.29	2.21	10.61**
Perceived symptom controllability	5.51	2.25	6.46	2.21	6.71	2.00	6.23*
CEQ-credibility of CBT	16.01	5.69	18.06	5.68	21.67	3.99	22.13**
CEQ-expectancy of CBT	15.82	6.63	18.08	6.48	20.94	5.77	11.54**

Note. * $p < .01$, ** $p < .001$, ^a $p = .06$, BI = Biological illness, MB = Malleable biology, CB = Cognitive-behavioral.

blame.

As a means of continuing to promote biological factors in ED development while still encouraging prognostic optimism and self-efficacy in overcoming ED symptoms, psychoeducation emphasizing the malleability of biological factors appears to hold promise. In particular, this psychoeducation led to superior prognostic expectations and self-efficacy in recovering in comparison with biologically-focused psychoeducation. These findings, taken together with those of [Lebowitz et al. \(2013\)](#); [Lebowitz & Ahn \(2015\)](#), suggest that clinicians who provide biological explanations to individuals with disordered eating should consider emphasizing the malleability of biological factors. Doing so has the potential to improve prognostic expectations and recovery-related attitudes compared to biologically-based psychoeducation while also yielding equivalent levels of self-blame.

The present study was the first to our knowledge to assess the effects of psychoeducation on ED development that emphasized the role of cognitive-behavioral factors in EDs ([Fairburn, 2008](#)). Similar to psychoeducation promoting the malleability of biological factors, cognitive-behavioral psychoeducation yielded better prognostic outlook and self-efficacy in overcoming symptoms compared with biologically-focused psychoeducation. Furthermore, cognitive-behavioral psychoeducation produced the highest levels of perceived credibility and expected efficacy of CBT among the three conditions. Although this finding may appear intuitive, it is nonetheless important. CBT is an efficacious treatment for EDs (e.g., [Fairburn et al., 2009](#)) and is recommended as a first-line intervention ([NICE, 2004](#)). Given that treatment expectations significantly influence outcome ([Rutherford et al., 2010](#)), psychoeducation emphasizing cognitive-behavioral factors may facilitate the clinical benefits of CBT to a greater extent than biologically-focused explanations by virtue of enhancing expectations for CBT effectiveness. Accordingly, clinicians who utilize CBT for EDs may maximize patient expectations for success by providing psychoeducation that emphasizes cognitive-behavioral factors in ED development. The extent to which such expectations translate into improved treatment outcomes among patients with EDs is an important topic for future research.

Another important area of future study involves the combination of psychoeducational components from different domains (e.g., biopsychosocial models of ED development). In particular, we believe the preliminary effectiveness of both malleable biology and cognitive-behavioral psychoeducation in the present study raises an important question: Would their combination represent the most effective way to simultaneously achieve multiple objectives, including: (a) underscoring ED severity through continued promotion of biological factors in ED development, (b) encouraging prognostic optimism and self-efficacy in overcoming EDs, and (c) facilitating heightened expectancies for the effectiveness of evidence-based cognitive-behavioral treatment? Such a combined

psychoeducational message is particularly desirable because the development of EDs is a product of both biological and psychosocial influences. We agree with [Crisafulli et al.'s \(2008, p. 339\)](#) conclusion:

... in the interests of accuracy and avoidance of harms associated with one-sided explanations, perhaps the ideal message to convey ... is that anorexia nervosa is a complex disorder caused by biological, genetic, and sociocultural factors, none of which are the fault of the sufferer."

The present findings suggest an important qualification to this conclusion: when integrating biological and psychosocial factors in psychoeducation about ED development, emphasizing the malleability of biological factors may neutralize their potentially harmful effects on patient attitudes.

The present study has several limitations. First, given the web-based nature of the study, our analogue sample was comprised of non-treatment-seeking individuals whose diagnostic status could not be confirmed. Use of a symptomatic community sample, as opposed to treatment-seeking participants with an ED diagnosis, allowed us to conduct this study without interfering with patients' ongoing treatment. Additionally, treatment-seeking patients diagnosed with an ED may have already received psychoeducation on the development of EDs and were thus less susceptible to the influence of our psychoeducational information. However, the generalizability of our findings is limited, as clinically diagnosed, treatment-seeking individuals' reactions to the types of psychoeducation assessed may differ from those of our sample. Second, our use of only the EDE-Q to characterize the severity of the sample excluded assessment of other potentially ED-relevant variables (e.g., body mass index). Third, to assess participants' self-blame, prognostic expectations, and self-efficacy in overcoming symptoms, we adapted a measure previously used by [Lebowitz et al. \(2013\)](#) to assess attitudes of depressed individuals. Given that the constructs assessed by this measure are done so with only one or two items, it is unclear whether this measure demonstrates optimal validity. The overall lack of validated measures of these important constructs is concerning, and the development of improved measures should be a focus of future research.

Conflict of interest

The authors have declared none.

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References

- Becker, A. E., Arrindell, A. H., Perloe, A., Fay, K., & Striegel-Moore, R. H. (2010). A qualitative study of perceived social barriers to care for eating disorders: perspectives from ethnically diverse health care consumers. *International Journal of Eating Disorders*, *43*, 633–647.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's mechanical Turk: a new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, *6*, 3–5.
- Causes of eating disorders. (2012). *Families empowered and supporting treatment of eating disorders*. Retrieved on June 18, 2015, from: <http://www.feast-ed.org/?page=causes>.
- Corrigan, P. W., Watson, A. C., & Barr, L. (2006). The self-stigma of mental illness: implications for self-esteem and self-efficacy. *Journal of Social and Clinical Psychology*, *25*, 875–884.
- Crisafulli, M. A., Von Holle, A., & Bulik, C. M. (2008). Attitudes towards anorexia nervosa: the impact of framing on blame and stigma. *International Journal of Eating Disorders*, *41*, 333–339.
- Crisp, A. (2005). Stigmatization of and discrimination against people with eating disorders including a report of two nationwide surveys. *European Eating Disorders Review*, *13*, 147–152.
- Devilly, G. J., & Borkovec, T. D. (2000). Psychometric properties of the credibility/expectancy questionnaire. *Journal of Behavior Therapy and Experimental Psychiatry*, *31*, 73–86.
- Easter, M. M. (2012). "Not all my fault": genetics, stigma, and personal responsibility for women with eating disorders. *Social Science & Medicine*, *75*, 1408–1416.
- Fairburn, C. G. (2008). *Cognitive behavior therapy and eating disorders*. New York: Guilford Press.
- Fairburn, C. G., & Beglin, S. (2008). Eating disorder examination questionnaire (EDE-Q 6.0). In C. G. Fairburn (Ed.), *Cognitive behavior therapy and eating disorders*. New York: Guilford Press.
- Fairburn, C. G., Cooper, Z., Doll, H. A., O'Connor, M. E., Bohn, K., Hawker, D. M., et al. (2009). Transdiagnostic cognitive-behavioral therapy for patients with eating disorders: a two-site trial with 60-week follow-up. *American Journal of Psychiatry*, *166*, 311–319.
- Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: a "transdiagnostic" theory and treatment. *Behaviour Research and Therapy*, *41*, 509–528.
- Hay, P. P., Bacaltchuk, J., Stefano, S., & Kashyap, P. (2009). Psychological treatments for bulimia nervosa and bingeing. *Cochrane Database of Systematic Reviews*, *7*, CD000562.
- Hepworth, N., & Paxton, S. J. (2007). Pathways to help-seeking in bulimia and binge eating problems: a concept mapping approach. *International Journal of Eating Disorders*, *40*, 493–504.
- Holliday, J., Wall, E., Treasure, J., & Weinman, J. (2005). Perceptions of illness in individuals with anorexia nervosa: a comparison with lay men and women. *International Journal of Eating Disorders*, *37*, 50–56.
- Kemp, J. J., Lickel, J. J., & Deacon, B. J. (2014). Effects of a chemical imbalance causal explanation on individuals' perceptions of their depressive symptoms. *Behaviour Research and Therapy*, *56*, 47–52.
- Klump, K. L., Bulik, C. M., Kaye, W. H., Treasure, J., & Tyson, E. (2009). Academy for eating disorders position paper: eating disorders are serious mental illnesses. *International Journal of Eating Disorders*, *42*, 97–103.
- Lebowitz, M. S. (2014). Biological conceptualizations of mental disorders among affected individuals: a review of correlates and consequences. *Clinical Psychology: Science and Practice*, *21*, 67–83.
- Lebowitz, M. S., & Ahn, W. (2015). Emphasizing malleability in the biology of depression: durable effects on perceived agency and prognostic pessimism. *Behaviour Research and Therapy*.
- Lebowitz, M. S., Ahn, W., & Nolen-Hoeksema, S. (2013). Fixable or fate? Perceptions of the biology of depression. *Journal of Consulting and Clinical Psychology*, *81*, 518–527.
- Lebowitz, M. S., Pyun, J. J., & Ahn, W. (2014). Biological explanations of generalized anxiety disorder: effects on beliefs about prognosis and responsibility. *Psychiatric Services*, *65*, 498–503.
- Mond, J. M., Hay, P. J., Rodgers, B., Owen, C., & Beumont, P. J. V. (2004). Validity of the eating disorder examination questionnaire (EDE-Q) in screening for eating disorders in community samples. *Behaviour Research and Therapy*, *42*, 551–567.
- National Institute for Clinical Excellence. (2004). *Eating disorders: Core interventions in the treatment and management of anorexia nervosa, bulimia nervosa and related eating disorders*. Retrieved June 18, 2015, from <http://www.nice.org.uk/guidance/cg9/resources/guidance-eating-disorders-pdf>.
- Nock, M. K., Ferriter, C., & Homberg, E. (2007). Parent beliefs about treatment credibility and effectiveness: assessment and relation to subsequent treatment participation. *Journal of Child and Family Studies*, *16*, 27–38.
- Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). Running experiments on amazon mechanical Turk. *Judgment and Decision Making*, *5*, 411–419.
- Rutherford, B. R., Wager, T. D., & Roose, S. P. (2010). Expectancy and the treatment of depression: a review of experimental methodology and effects on patient outcome. *Current Psychiatry Reviews*, *6*, 1–10.
- Shapiro, D. N., Chandler, J., & Mueller, P. A. (2013). Using mechanical Turk to study clinical populations. *Clinical Psychological Science*, *1*, 213–220.