REGULAR ARTICLE

Emotion Contagion Moderates the Relationship Between Emotionally-Negative Families and Abnormal Eating Behavior

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ABSTRACT

Objective: To reconcile empirical inconsistencies in the relationship between emotionally-negative families and daughters' abnormal eating, we hypothesized a critical moderating variable: daughters' vulnerability to emotion contagion.

Method: A nonclinical sample of undergraduate females ($N = 92$) was recruited via an advertisement and completed self-report measures validated for assessing: families' expressive negativity, daughters' susceptibility to emotion contagion, dietary restraint, and disinhibition, eating attitudes, and several control variables (interpersonal orientation, alexithymia, and the big five personality traits: extraversion, conscientiousness, openness, neuroticism, and agreeableness).

Results: All variables and interactions were entered as predictors in a multistep multiple regression equation. Only an emotion contagion by family expressivity interaction term significantly predicted unhealthy eating attitudes ($\beta = .29$, $p = .02$) and dietary restraint ($\beta = .27$, $p = .03$). Negatively expressive families significantly induced unhealthy eating and restraint but only among young women susceptible to emotion contagion ($ps < .05$).

Discussion: Young women susceptible to emotion contagion may be at increased risk for eating disorders.

Keywords: emotion contagion; social cognition; family expressiveness

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Introduction

There is a long history of research on the role of families in daughters' eating disorders.[1] Early accounts described families of individuals with anorexia nervosa as intrusive and "enmeshed," causing children to have difficulty forming their own identities and perhaps to control their eating in an effort to assert independence.[1–3] Although not specific to family intrusiveness, there seems to be more emotional discord in families of eating disordered daughters, and conflict and negative affect may be especially prevalent in families with bulimia nervosa patients.[4–7] Yet a recent review suggests that evidence for the relationship between family emotion and daughters' disordered eating is mixed at best.[8] We suggest that sensitivity to others' emotions might increase the likelihood that young women develop unhealthy eating attitudes and habits as a consequence of a negatively expressive family.

Emotion contagion describes a special sensitivity to others' emotions, in which people unintentionally "catch" emotions from simple exposure to others' behavior.[9] For example, a number of studies show that exposure (even subliminal) to facial expressions of emotion evokes similar affect in perceivers.[9–12] Importantly, there are stable individual differences in the degree to which people "catch" others' emotions and we expect these individual differences to have implications for unhealthy eating.[9,12] Although some scholars regard emotion contagion as a generally healthy trait, involved as it is in human empathy, the impact of emotion contagion on well-being should logically be constrained by the emotional environment such that people susceptible to emotion contagion benefit from positive contexts and suffer from negative contexts. Hence, we did not expect emotion contagion to impact unhealthy eating behavior independent of

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TABLE 1. Correlations among all variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Emotion contagion												
2. Positive Family	.09											
3. Negative Family	−.05	−.29										
4. Dietary Restraint	.12	.07	.08									
5. Eating Attitudes	.02	−.13	.13	.60								
6. Extraversion	.17	.07	.00	.11	−.02							
7. Agreeableness	.32	.32	−.25	−.02	−.09	.08						
8. Conscientiousness	.05	.21	.02	−.03	−.02	−.11	.11					
9. Emotional Stability	.01	.09	−.13	−.10	−.19	.08	.37	.06				
10. Openness	−.02	.09	−.01	−.12	−.21	.37	.16	.02	.32			
11. Interdependence	.54	.19	.02	.14	.11	.17	.33	−.03	−.12	−.04		
12. Alexithymia	−.22	−.17	.08	.06	.26	−.48	−.33	−.12	−.40	−.36	−.15	

Note: $p < .05$, $p < .01$.

(family) emotional context. Rather, individuals who are especially susceptible to emotion contagion should be especially influenced by the negative emotions of family members and peers. Emotion contagion might thus account in part for inconsistency in the relationship between family emotional discord and eating disorders, with people high in emotion contagion most influenced by family emotion.

There are several reasons that individual differences in susceptibility to emotion contagion might moderate the relationship between negative family emotions and eating disorder symptoms. Susceptibility to emotion contagion coupled with a negative family environment might lead young women to use food (or another source) to regulate their negative emotion. In particular, they might try to ameliorate negative feelings via disinhibited eating.[13–16] Second, susceptibility to emotion contagion in a negative family might lead to reduced self-esteem and young women with low self-esteem can resort to unhealthy eating habits in an effort to reduce body dissatisfaction (by slimming down).[17,18] Conversely, being low in emotion contagion might inoculate young women against negative family emotions and ultimately, unhealthy eating. The impact of a negative family environment on unhealthy eating habits might thus depend on daughters' susceptibility to emotion contagion. We test these hypotheses here.

Method

Participants

Ninety-two undergraduate females at a private university in the northeastern United States were recruited via a university website and were offered $20 for their participation. This nonclinical sample was of a healthy weight on average (M_{BMI} = 21.75, SD_{BMI} = 3.02), with 82% within the World Health Organization's recommended BMI (18.5–24.9). An additional 7% had low BMIs and 11% had high BMIs (one obese participant). Sixty-three percent were white, 20% were Asian, 6% were black, 8% were multiracial, and 3% did not report ethnicity.

Importantly, our sample exhibited eating characteristics commensurate with published norms. Adolescent girls' scores on the eating attitudes test (EAT-26) include a normative mean of 11.9 with a standard deviation of 10.8 and the relevant values in our sample were quite similar (M = 13.4, SD = 9.3).[19] Normative values for the dietary restraint scale include a median between 12 and 14, an average around 13, and a standard deviation close to 6.[20] Our sample exhibited similar values (Median = 14, M = 14.5, SD = 5.2). Finally, the correlation between the EAT-26 and dietary restraint was identical to that published in a normative sample (see Table 1).[19]

We made an effort to assess the presence of psychiatric disorders in this nonclinical sample. Prior to debriefing, participants were provided with single paragraph descriptions of common psychiatric disorders and were asked to indicate whether or not they had been diagnosed by a healthcare provider. One participant each had been previously diagnosed with anorexia, bulimia, anorexia and bulimia, binge-eating disorder, and eating disorder not otherwise specified. Other reported disorders included depression (14 participants), generalized anxiety (5), panic (2), obsessive-compulsive (1), and phobia (3). No participants reported a history of autism spectrum disorders, schizophrenia, or agoraphobia.

Materials

The questionnaires that index the two predictive variables are described below. The psychometric properties of the outcome variables (the Restraint Scale and the EAT) as well as the 10-item personality inventory (TIPI) of emotional stability, extraversion, emotional stability, openness, and agreeableness, the relational-independent self-construal (RISC) scale, and the Toronto Alexithymia Scale (TAS) are described in detail elsewhere.[21–25]

Emotion Contagion Scale. The 15-item emotion contagion scale (ECS) indexes the degree to which people respond to others' feelings with similar emotions.[12] Example items include, "I tense up when hearing an angry quarrel" and "being with a happy person picks me up when I'm feeling down." Across several studies, this scale exhibited internal consistency ($\alpha \approx .9$), test-retest reliability ($\alpha \approx .84$), was correlated but not redundant with related variables (e.g., extraversion, emotional stability), and was predictive of actually "catching" emotion in experimental settings.[12,26,27] Scores can range from 15 to 75 (here, $M_{ECS} = 44.0$; $SD_{ECS} = 24.9$).

Family Expressiveness Scale. The family expressiveness questionnaire (FEQ) includes 40 items that inquire about the expressive tendencies of family members.[28] Examples include "expressing deep satisfaction or love for someone" (positive expressivity) and "crying for being punished" (negative expressivity). The subscales exhibit internal consistency ($75< \alpha <.88$), test-retest reliability ($rs > 0.9$), and family members report similar family expressiveness.[28] Participants indicate the frequency with which each item occurred in their family (from 1, not at all, to 9, very frequently) such that scores on each subscale can range from 20 to 180. Scores are typically low and were in the current sample ($M_{Positive} = 57.27$; $M_{Negative} = 47.06$).

Procedure

Upon arrival at the laboratory, participants completed informed consent and were informed that we were interested in the relationship among personality traits. They were then given the personality questionnaires to complete in the following order: EC, RISC, TIPI, FEQ, EAT-26, restraint scale, and finally the TAS. Participants were then debriefed and dismissed.

Results

We adopted multiple regression procedures because neither of the primary predictors (emotion contagion, family expressiveness) has been validated as categorical constructs. All participants remained in analyses but critically, results were not meaningfully altered by the exclusion of participants who reported eating disorders.

Preliminaries: Zero-Order Correlations

Simple zero-order relationships among the variables (see **Table 1**) revealed several significant or otherwise notable correlations. Importantly, vulnerability to emotion contagion was unrelated to either positive or negative family expressiveness. Thus, interaction terms involving emotion contagion and expressiveness are thereby based on independent factors. Second, emotion contagion was positively associated with a relational conception of the self and negatively associated with alexithymic symptoms—these are novel findings that can be theoretically anticipated (see Method). Third, restraint and eating attitudes were highly correlated, supporting that the two variables indexed similar constructs here.

Multiple Regression: Main Effects

All of our analytic procedures follow recommendations for examining main effects and interactions in multiple regression equations.[29] We created two multistep regression equations, one for each outcome variable (restraint and eating attitudes). Predictors and covariates were centered by subtracting the mean and were then entered at the first step in the regression equation, such that the estimate for each predictor controls for all other predictors. None of the predictor variables was significantly associated with scores on the dietary restraint scale ($ps > .11$). Only alexithymia scores were positively associated with eating attitude scores, $\beta = .33$, $t(80) = 2.47$, $p = .02$. There was no simple effect of emotion contagion on unhealthy eating.

Multiple Regression: Interactive Effects

As recommended for multiple regression, two- and three-way interaction terms were added at the second and third step, respectively.[29] Each interaction term was calculated by multiplying the scores of the relevant (and centered) predictor variables. For example, the emotion contagion by negative family expressiveness interaction term was calculated by multiplying scores from the centered versions of these two variables. As expected, emotion contagion interacted with negative (but not positive) family expressiveness in predicting dietary restraint, $\beta = .35$, $t(80) = 2.80$, $p = .006$ (see **Fig. 1**), and in predicting eating attitude scores, $\beta = .29$, $t(80) = 2.33$, $p = .02$ (see **Fig. 2**). We simplified these interactions by assessing the slope for negative family expressiveness at one SD above (high in emotion contagion) and below (low in emotion contagion) the mean for emotion contagion.

Dietary Restraint. For women especially vulnerable to (high in) emotion contagion, the slope for negative family expressiveness was positive, $\beta = .55$, $t(80) = 2.37$, $p = .008$. Negatively expressive families thus predisposed women high in emotion contagion to exhibit dietary restraint. A similar effect did not emerge for women who were not terribly vulnerable to emotion contagion $\beta = -.17$, $t(80) = -1.20$, $p = .23$ (see **Fig. 1**). The impact of a nega-

FIGURE 1. Dietary restraint as a function of negative family expressiveness and emotion contagion. High and low family expressiveness (*x*-axis) and emotion contagion (different lines) reflect predicted values 1 SD above (high) and 1 SD below (low) the mean on each variable.

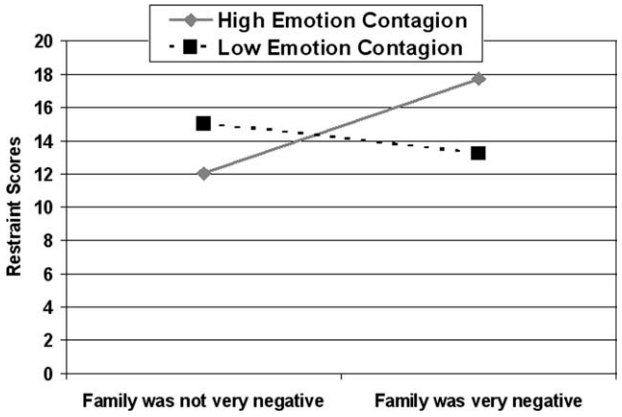
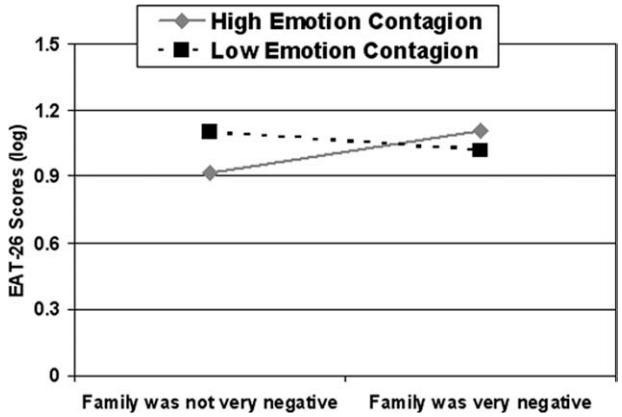


FIGURE 2. Eating attitudes as a function of negative family expressiveness and emotion contagion. Raw scores on the EAT-26 were positively skewed and thus the *y*-axis reflects log-transformed EAT-26 scores. High and low family expressiveness (*x*-axis) and emotion contagion (different lines) reflect predicted values 1 SD above (high) and 1 SD (below) below the mean on each variable.



tively expressive family on dietary constraint was thus specific to women who were highly vulnerable to catching others' emotions.

Eating attitudes For young women highly vulnerable to emotion contagion, the slope for negative family expressiveness was positive, $\beta = .39$, $t\ (80) = 2.03$, $p = .054$. For these women, negatively expressive families were predictive of unhealthy eating attitudes. The same effect did not emerge for women who were not terribly vulnerable to emotion contagion, $\beta = -.16$, $t\ (80) = -1.16$, $p = .25$ (see **Fig. 2**). The impact of a negatively expressive family on eating attitudes was thus specific to women who were highly vulnerable to catching others' emotions.

Discussion

Emotion contagion has recently received a great deal of interest across the cognitive sciences because of the role this construct might play in human empathy and bonding. Here, we identify a potentially more pernicious role for emotion contagion in social life. Young women who were especially likely to experience emotion contagion were also especially likely to exhibit unhealthy eating attitudes and habits in response to an emotionally negative family environment. Conversely, young women who were relatively uninfluenced by others' emotions were somewhat inoculated against the effects of a negative emotional environment. These effects emerged even after controlling for a variety of related constructs (e.g., neuroticism, alexythimia).

Although causal explanations of these effects could not be definitively confirmed in this correlational study, several such explanations are supported by prior research. First, others' negative emotions are known to exert especially negative influences on individuals high in trait emotion contagion.[12] To prevent or reduce such negative affect, susceptible women might employ unhealthy eating habits; indeed, young women often try to regulate emotion via unhealthy eating.[13–16] In addition, the negative affective influence of the family might lead susceptible women to restrict intake as a means to ameliorate low self-esteem; indeed, low-self esteem is a concomitant of chronic negative affect and a risk factor for eating pathology (via body dissatisfaction).[18] Nonetheless, the present work is a correlational design that cannot definitively support causal pathways. And although the instruments used here were valid and relatively free of social desirability concerns, direct observation of eating behavior is important for evaluating ecological validity. Hence, it would be instructive to experimentally manipulate emotional environment and measure eating habits to test whether a negative environment causes unhealthy eating only among women high in emotion contagion.

More generally, we hope that the present findings motivate scholars interested in eating disorders to consider emotion contagion as an important individual difference variable potentially capable of explaining variability in unhealthy eating behavior. Ultimately, the precipitating role of families (and the social environment more generally) in the

development of eating disorders may well depend on the adolescents' susceptibility to emotion contagion.

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