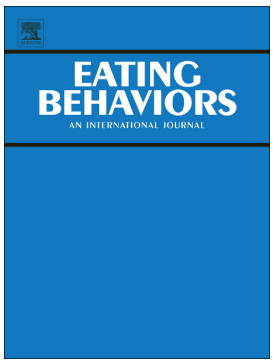

Emotional intelligence, anxiety, and emotional eating: A deeper insight into a recently reported association?

Leehu Zysberg

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Emotional Intelligence, Anxiety, and Emotional Eating: A Deeper Insight into a Recently Reported Association?

Leehu Zysberg, PhD.

Associate Professor, The graduate school,

Gordon College of Education

73, Tchernichowski st., Haifa, Israel.

Phone: +972-584877771

Email: leehuzysberg@yahoo.com leehu@gordon.ac.il

Emotional Intelligence, Anxiety, and Emotional Eating: A Deeper Insight into a Recently Reported Association?

ABSTRACT

Recent studies reported a negative association between emotional intelligence (EI: defined here as individual predispositions associated with effective identification and regulation of emotions) and emotional eating. Although theory provides some insights into how the concept represents mechanisms that may serve as protective factors, empirical evidence of the mechanism behind the association has yet to be presented. This study tested a proposed model in which anxiety levels mediate the association between emotional intelligence and emotional-eating patterns in a normative sample of women in Israel. A cross-sectional/ correlational design was used to gather data from 208 generally healthy female participants who completed measures of trait emotional intelligence, anxiety, and tendency toward emotional eating, as well as demographics. Anxiety levels mediated the negative association between emotional intelligence and emotional eating. Background variables had only marginal involvement in this model. The results shed light on the mechanisms underlying the association between emotional intelligence and emotional eating. Should future studies corroborate the findings, they may serve as a basis for future screening protocols, prevention and interventions with individuals and groups at risk of EE and eating disorders.

Keywords: emotional eating, eating disorders, anxiety, emotional intelligence

1. INTRODUCTION

Emotional eating (EE) is a term used to describe food consumption initiated as a response to (usually negative) emotional experiences (Arnow, Kenardy, & Agras, 1995; Michopoulos, Powers, Moore, Villarreal, Ressler, & Bradley, 2015). This behavior pattern is considered a symptom of dysfunctional coping, a risk factor for various health conditions, including eating disorders (Eldredge & Agras, 1996; Farrow, Haycraft, & Blissett, 2015). EE is therefore a serious health concern. The literature addressing the etiology of EE associates it with difficulties in emotion regulation and in processing emotional information as well as with restrictive expression of emotions and even alexithymia (Arnow et al., 1995; Bydlowski et al., 2005). In other words, EE is often seen as a dysfunctional behavior pattern stemming from inadequate regulation of (mainly) negative emotions. As a result, a body of research has explored risk and protective factors associated with emotional experiences and the way individuals process them (Macht, 2008).

Since at least a part of the etiology of EE may be attributed to mismanaged emotions, researchers and practitioners alike seek potential concepts that may account for processes underlying the emergence of EE. A relatively new concept that describes psychological resources allowing individuals to identify, process, and manage emotions effectively is emotional intelligence (EI; see Mayer & Salovey, 1993). The literature presented two conceptualizations of EI: (a) as a mental ability, equivalent to scholastic intelligence, allowing adequate emotional information processing and its integration in thought and problem solving; and (b) as a cluster of personality attributes associated with emotional integration, regulation, and adaptability (Neubauer & Freudenthaler, 2005).

According to the latter view, EI represents a group of personality traits that can be placed on a continuum from rigidity to flexibility, describing the extent to which individuals respond to and cope with emotional and interpersonal challenges. Current conceptualizations of trait EI refer to individual predispositions related to well-being, self-control and self-management, emotionality (i.e., identifying, understanding, and effectively expressing emotions), and sociability (Petrides, Mikolajczak, Mavroveli, Sanchez-Ruiz, Furnham, & Pérez-González, 2016).

Trait EI is often investigated in health research and shows stronger associations with various health outcome measures when compared with other models and measures of EI in this field (Schutte, Malouff, Thorsteinsson, Bhullar, & Rooke, 2007). Therefore the personality EI approach is our model of choice in the current study.

EI has been associated with a broad range of health outcomes (Martins, Ramalho, & Morin, 2010), but only recently has preliminary evidence suggested a link between EE, tendency toward eating disorders, and EI (Markey & Vander Wal, 2007; Zysberg, 2014; Zysberg & Rubanov, 2010). The underlying hypothesis was that EI allows individuals to process and regulate emotions effectively, thereby reducing the likelihood of EE. Whereas the evidence gathered in the few studies conducted in this venue supports a negative association between EI and EE, the mechanisms accounting for this association remain elusive. EE seems to be associated with difficulties processing and coping with (mostly) negative emotions, and EI is described in the literature as a resource allowing effective identification and processing of emotions. We may therefore suggest that higher EI means more effective processing of negative emotions (translated to lower levels of negative emotions such as fear, anxiety, frustration, etc) which in turn may be associated

with a reduced tendency toward EE. More specifically, evidence points to anxiety and stress as potential culprits in the appearance of EE behaviors in normative and clinical samples (Goossens, Braet, Van Vlierberghe, & Mels, 2009; Nguyen-Rodriguez, Unger, & Spruijt-Metz, 2009). Whereas some evidence links EI and stress management processes (e.g., Ciarrochi, Deane and Anderson, 2002), the role of anxiety is less clear. Anxiety is generally defined as an emotional response resulting from stress involving fear, apprehension, sense of danger, and recurring thoughts and worries (Spielberger, 2013). Thus anxiety is a response to unmitigated stress, reflecting longer term psychological processes. Existing preliminary evidence suggests a negative association between EI and anxiety (Fernandez-Berrocal, Alcaide, Extremera, & Pizarro, 2006), but when it comes to health related outcomes, the association has yet to be empirically tested.

One possible interpretation of the general picture emerging from the evidence mentioned above is that we may break down the negative association between EI and EE into a negative association between EI and levels of anxiety, and a positive association between anxiety and tendency toward EE. While these two have already been demonstrated in the literature, an integration of the two may be considered a mediation model.

It was hypothesized, then, that the relationship between EI and EE is mediated by levels of anxiety.

2. METHODS

2.1. Study design

To explore the potential association patterns between our focal variables, we used a correlational/ cross-sectional study design to collect and analyze our data.

2.2. Sample

Two hundred and eight women were recruited through various online forums to take a brief survey "of health issues among women." Participants' ages ranged from 24 to 65 years (M = 40.36, SD = 9.54); 85% were married or in a stable relationship, 7.5% were single, 6% were divorced, and the rest were widowed. The participants had between zero and six children (M = 2.20, SD = 1.20). Three percent of the sample had earned a high school diploma, 3% reported having some postsecondary education, 40% held a bachelor's degree, and 50% had a master's degree or higher (the rest did not report their education). Accordingly, 70% reported having an above-average or higher income level (using the national mean income as an anchor). Most (71%) worked full time, 23% reported working part time, and 6% reported not working outside the household. All reported having good health or having no debilitating condition.

2.3. Measures

Participants provided basic demographic information as described above in Section 2.2 and completed three standardized, validated measures of the study variables. Descriptive statistics and reliability coefficients based on the current study sample are presented in Table 1 in the results section.

Emotional intelligence was assessed using the Trait Emotional Intelligence Questionnaire in its short form (TEIQue–SF; Cooper & Petrides, 2010), a 30-item self-report measure of trait EI, chosen for its internal stability (typically.85–.90) and its predictive validity in health-related studies (see Schutte et al., 2007, for a review).

Anxiety was assessed using the Hamilton Anxiety Scale (Hamilton, 1959), administered online as a self-directed, structured, computerized interview. The 14-item

scale is considered the gold standard in research and practice for assessing anxiety symptoms in various settings, including clinical. Internal reliability is acceptable (.70–.74). Known group validity was established in numerous studies (e.g., Maier, Buller, Philipp, & Heuser, 1988).

Emotional eating was assessed using the Emotional Eating subscale of the Dutch Eating Behavior Questionnaire (van Strien, Frijters, Bergers, & Defares, 1986). This section is a 13-item list of emotional states; participants are asked to indicate the extent to which each condition is accompanied by the desire to eat. The scale demonstrates good reliability (.94) and construct validity (e.g. Lluch et al., 1996).

2.4. Procedure

The study and the procedures were approved by the author's institutional review board. Participants were recruited online using bulletin boards, Facebook groups, and social networking forums (such as LinkedIn and WhatsApp groups). Only female group members were invited to take "a survey on women's health issues" and, if possible, to recruit their female friends in other online communities. Completing the questionnaires took about 12 to 15 minutes. All participants who took the survey completed and submitted their entry. The online survey was designed to not collect identifying data (e.g., computer Internet Protocol or email addresses) at any stage of the procedure; the data remained anonymous throughout the process. Recruitment ended once 200 participants had joined the study (per a-priori power computation that yielded a recommended sample size of 180 given the model design, analysis, and power set at .85). However, by the time of data extraction, a few more participants had completed the online survey and were thus included in the final sample.

2.5. Data analysis

After calculating the basic descriptive statistics, we used regression analysis to determine which of the model's variables (including potential intervening factors) were associated with the target variable, after controlling for shared variance. Then, to test the model presented above, we chose a mediation analysis. Despite the correlational nature of the data, which limits the ability to test causal reltionships between variables, the mode may allow testing associations that, if supported, may serve future studies in establishing causal relationships.

We used AMOS 20.0 software to test the hypothesized mediation model, using the SEM path analysis procedure with bootstrapping. The model was used to demonstrate the theoretical protective nature of EI, reflected by the hypothesized negative association with anxiety which in turn associates positively with EE.

3. RESULTS

Before testing the study model, we obtained descriptive statistics and distributions for the main study variables. Zero-order correlations among the variables were calculated as well. The results are summarized in Table 1.

[Insert Table 1 here]

The data reflects adequate distribution of the main variables and high reliability levels in our sample. Correlation patterns suggest partial support of the hypothesized model and rudimentary validation of our measures: EI, anxiety, and EE showed correlations supporting the hypothesized relationships between the variables. The moderate association between education and EI echoes a substantial body of research associating EI and academic performance (Petrides, Frederickson & Furnham, 2004). The

moderate negative association between income level and anxiety also echoes well-established findings, lending support to the validity of our measures (Gallo & Matthews, 2003).

Next, we tested the nature of the associations between the main study variables, including basic demographics, through a linear regression analysis using the demographic variables (age, income, and education), EI, and anxiety scores as independent factors and EE scores as a dependent factor. The results are summarized in Table 2.

[Insert Table 2 here]

The results suggest that whereas EI is negatively associated (as expected) with EE and anxiety is positively associated with EE (again, as proposed by the model), there were no significant associations between the background variables and EE when controlling for shared variances.

We then proceeded to test the mediation effect using path analysis as mentioned above. The results are presented in Figure 1.

[Insert Figure 1 here]

Goodness of fit indices reflect a good level of fit of the model with the data: Chi-square = 4.38; (df = 3); $p > .05$; CFI = .94; NFI = .95; RMSEA = .03.

All marked association coefficients are significant at $p < .01$ or better. The coefficient in parentheses is the direct association between EI and EE without controlling for anxiety. The difference between the two path coefficients is statistically significant at $p < .02$. The standardized indirect effect is $(-.36) \times (.41) = -.15$, representing the mediated association between EI and EE via the effect of anxiety. Bootstrapping was used to test the

association coefficient's statistical significance. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval ranged from −9.00 to −4.12 (b = −6.64).

The analysis supports the proposed model according to which the negative association between EI and EE is accounted for by a direct effect as well as by anxiety. Comparing the direct path coefficients with and without controlling for anxiety resulted in a statistically significant drop, as expected on the theoretical level.

4. DISCUSSION

This study examined a proposed model accounting for the association between EI and EE. It was hypothesized that anxiety levels mediate the negative association between the two variables. The evidence, collected from a community sample of women dwelling in Israel supported the model, thus taking this budding field of research one small step further by proposing a potential mechanism(that could be one among many) explaining how EI associates with EE.

EE is considered a risk behavior in its own right and a so-called gateway behavior that may lead to eating disorders (Geliebter & Aversa, 2003). Current theory and empirical evidence emphasize the pivotal role of emotions, and more particularly negative emotions in this troubling phenomenon (Greeno & Wing, 1994; Van Blyderveen, Lafrance, Emond, Kosmerly, O'Connor, & Chang, 2016). No wonder, then, that EI, a concept directly associated with how effectively individuals process and manage emotions, shows a negative association with EE (Zysberg & Rubanov, 2010). A few studies supported this association in a variety of settings that included normative

participants as well as samples of individuals diagnosed with eating disorders (Markey & Vander Wal, 2007; Zysberg, 2014; Zysberg & Tell, 2013).

What mechanisms account for the negative association between EI and EE? The literature on EE points toward negative emotional experiences as keys to EE symptoms or behaviors. The two most basic negative emotional experiences identified in the psychological literature are stress and anxiety (Folkman, 2013). Although these "usual suspects"—stress and anxiety—were well investigated in other contexts (e.g., Arnow et al., 1995; Wang & Li, 2017), the concept of anxiety has yet to be tested as the underlying mechanism accounting for the impact of EI on EE.

Anxiety is a major concept in our understanding of mental and physical health as well as well-being in clinical and nonclinical populations (Bogg & Roberts, 2004; Larcombe, Tumbaga, Malkin, & Nicholson, 2013). Anxiety is a manifestation of stress, which tends to linger and generalize beyond specific stressors (Martin & Dahlen, 2005). As such, it shows evidence of association with both EI and EE in the existing literature: Bennett, Greene& Schwartz-Barcott, (2013) reported an association between negative emotional experiences (one of them is anxiety) and emotional eating. Other studies report negative association between EI and anxiety levels (Lizeretti & Extremera, 2011). Because we are interested in psychological mechanisms that transcend specific contexts of distress or relief, anxiety is a valid candidate for an emotional reaction that may serve as an underlying factor in the association found in the literature. The negative association found between EI and anxiety levels, as well as the positive association found between anxiety level and tendency toward EE both align well with the theoretical models of EI and EE and the empirical findings already reported (and mentioned above). The existence

of a direct (or otherwise mediated) path between EI and EE may mean that EI is either directly associated with EE or that additional mediators, not included in the current study and frame of the model proposed here, are in play and are yet to be pointed out.

This study is among the first to explore possible underlying mechanisms accounting for the association between EI and EE; however, certain limitations need to be considered when addressing the results. First, the sample is somewhat biased demographically. Although the literature (as well as the results) suggested that socioeconomic status and other demographic characteristics may not be consistently associated with EE, it should be considered in generalizing the results. The cultural aspect is yet another potential limitation of the sample: Culture may play an important role in the incidence and antecedents of EE and disordered eating patterns (Hood, Vander Wal, & Gibbons, 2009). And whereas there is evidence that Israeli samples provide data and findings that are congruent with findings from U.S. and western E.U. samples (e.g., Dolan, 1991), generalization to other target populations should be done with care. The use of a correlational design in which all measures were taken at the same time-point is yet another challenge to our interpretation of the results. Although the data exposed associations supporting the theoretical bases of the concepts involved, the model as presented here should be interpreted with care. The main issue is causation: while we did demonstrate a negative path between EI and anxiety, we may not be able to claim that EI influences anxiety levels but may instead point to the path as potential evidence of the protective value of EI against anxiety, and so on. A longitudinal study may clarify the model further and help with interpretation of the paths found here. An additional point is the extent to which anxiety is indeed the most significant mediator possible in such a

model. Whereas theory suggests that anxiety is a sound candidate for such analysis, we did not control for other candidates such as emotion regulation, generalized stress, or depression, among others. However, anxiety is a major concept in our understanding of health and well-being in numerous settings, and its place in such a model is easy to understand. Last but not least, we used self-report measures: While we chose widely acceptable and validated measures of the concepts involved, they might still be vulnerable to biases known in the methodological literature (Donaldson & Grant-Vallone, 2002). Although these are satisfactory for preliminary exploration, future research may use behavioral and clinical measures and compare a variety of target populations, both normative and clinical. Future studies may also, as mentioned above, benefit from using a longitudinal design to better test causal or at least time-dependent paths of association. It may also be of interest to explore the association between EE and eating disorders by exploring the role of EE vis-à-vis criteria related to the clinical diagnosis of eating disorders such as BMI, food restriction, and elimination.

Limitations notwithstanding, this study provided preliminary evidence supporting a potential mechanism or path that may underlie the association between EI and EE. Our findings, should they be corroborated by additional findings, may be the basis for future screening at-risk groups and individuals as well as for interventions to ameliorate the risks of EE and eating disorders. New screening techniques and tools may be presented as well as new interventions focused on emotional flexibility and anxiety management as empirically supported instruments for identifying individuals at risk, or intervening with individuals already showing symptoms of EE.

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Table 1

Descriptive statistics and intercorrelations between the study variables (N = 208).

	1	2	3	4	5	6
EI	—					
Anxiety	−.37**	—				
EE	−.36**	.41**	—			
Age	.09	−.09	−.04	—		
Education	.14*	−.10	.00	.26**	—	
Income	.11	−.16*	−.09	.28**	.29**	—
Mean	3.78	27.40	28.20	40.36	—	—
Standard deviation	.50	7.05	10.01	9.54	—	—
Crobach's alpha	.85	.88	.89	—	—	—

Note.

EI = Emotional intelligence measure (TEIQue–SF: Trait Emotional Intelligence Questionnaire, Short Form); EE = Emotional eating subscale.

*p < .05; **p < .01.

Means and standard deviations for education and income level are not presented given the ordinal nature of the scales. Their distributions are described in detail in Section 2.2.

Table 2

Linear regression analysis of the research model, accounting for variance in the emotional eating score (N = 208).

	B	Beta
EI	−5.34	−.26**
Anxiety	.39	.28**
Age	−.01	−.01
Education	1.46	.09
Income	−.09	−.01
Constant	32.13	—

Note.

EI = Emotional intelligence measure (TEIQue–SF).

**$p < .01$.

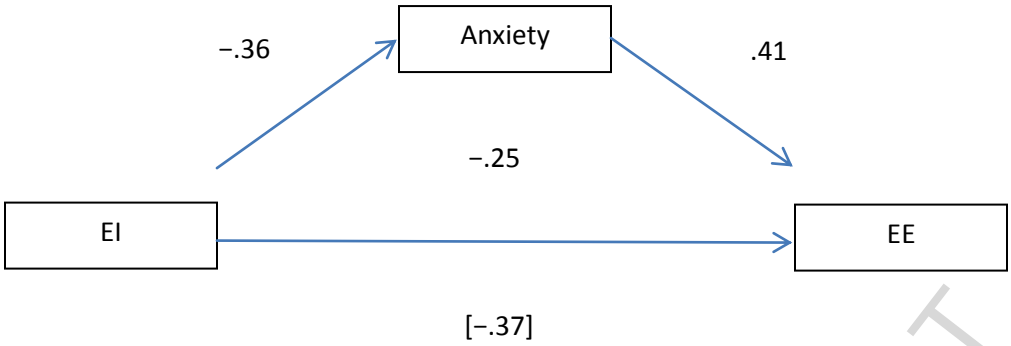

Figure 1. A path analysis summary of a mediation model associating emotional intelligence (EI), anxiety and emotional eating (EE) patterns). Error indications are omitted for the sake of ease of presentation.

Highlights

- The negative association between emotional intelligence and emotional eating is only recently reported.
- While theory points out negative emotion regulation as an underlying mechanism accounting for the association, no empirical evidence has been presented yet to support of refute this line of thought.
- This study tested a model in which anxiety levels mediate the association between emotional intelligence and emotional eating.
- The results support a partial mediation model: While anxiety level mediates part of emotional intelligence's effect on emotional eating, a direct (or otherwise mediated) path was also supported by the evidence.