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Abstract

Many individuals diagnosed with eating disorders describe their disorder as being represented by an internal 'voice'. In line with cognitive models of voice-hearing, previous research has identified associations between voice appraisals and eating psychopathology in anorexia nervosa. Whether these findings generalise to other eating disorder subtypes remains unknown. The aetiology of the internal eating disorder voice also remains unclear. Traumatic-dissociative models of voice-hearing, which link such experiences to decontexualised material arising from early traumatic events, might also be relevant to eating disorder groups. To determine whether cognitive models of trauma and voice-hearing apply across eating disorder subtypes, 85 individuals fulfilling ICD-10 criteria for an eating disorder completed self-report measures regarding eating disorder cognitions, voice-related appraisals, childhood trauma, and dissociation. The relative power of the eating disorder voice was found to be positively associated with experiences of childhood emotional abuse, and this relationship was partly mediated by dissociation. In addition, eating disorder voices appraised as powerful and benevolent predicted more negative attitudes towards eating across diagnostic groups, but were unrelated to disordered eating behaviours or weight. These findings suggest that the eating disorder voice plays a role in a meaningful role in eating pathology across diagnoses and that this experience might be related, in part, to experiences of childhood maltreatment. Therapeutic implications are discussed.

Keywords: Abuse; anorexic voice; dissociation; eating disorders; eating disorder voice; trauma

Abbreviations: Anorexia Nervosa (AN); Body mass index (BMI); Bulimia Nervosa (BN); Childhood emotional abuse (CEA); Eating disorders (ED); Eating disorder voice (EDV); Other Specified Feeding and Eating Disorders (OSFED); Trauma-dissociation model (TMD)

Childhood trauma, dissociation, and the internal eating disorder 'voice'

Individuals with eating disorders (EDs) commonly refer to an internal 'voice' of their disorder, which has been defined as "a second or third person commentary on actions and consequences relating to eating, weight, and shape" (Pugh & Waller, 2016, pp. 622). Such experiences have been reported in some of the earliest psychotherapeutic descriptions of disordered eating (Bruch, 1978; Davis, 1991) and now represent a growing area for research. Incidence of the eating disorder voice (EDV) is estimated to range from 33.3% (anorexia nervosa [AN] alone) (Wentz, Gillberg, Gillberg, & Rastam, 2001) to 96.2% (mixed ED samples) (Noordenbos & Van Geest, 2017). Regarding phenomenology, single EDVs are most often experienced by individuals, although two or more voices are not uncommon (Noordenbos, 2017). Typically, the EDV is experienced as internally generated (i.e., reflecting one's own thoughts and feelings towards shape, weight, and eating) and yet phenomenologically distinct from the self (Pugh, 2016). In a minority of cases, however, the EDV is described as having an external origin (e.g. Kelly, Kamali, & Brennan, 2004). Reflecting continuum models of voice-hearing (Baumeister, Sedgwick, Howes, & Peters, 2017; Bentall, 2003; Johns & van Os, 2001), these observations suggest that the EDV may exist at varying points between the poles of inner speech and 'true' auditory hallucinations.

Whilst the EDV has been referenced in many first-person accounts of EDs (e.g. Woolf, 2012), limited research has explored this phenomenon directly. Qualitative studies (Duncan, Sebar & Lee, 2015; Jenkins & Ogden, 2012; Higbed & Fox, 2010; Tierney & Fox, 2010; 2011) suggest a stage-like progression in how the EDV is experienced and related to. Many individuals describe the EDV as a positive presence in the early stages of illness and one which fulfils valued functions, such as guiding decision-making ('Direction'). With time, however, the EDV tends to adopt a more hostile, coercive and controlling persona ('Domination'), resulting in feelings of entrapment and subservience to the voice ('Disempowerment'). For

some individuals, this may eventually galvanise resistance to the voice ('Defiance') and culminate in a reclamation of autonomy and recovery ('Deliverance'). Unfortunately, changing the relationship with the EDV may also carry costs such as loneliness and fears about relapse ('Disquiet'). Within this context, changes in how individuals relate to the EDV appears to mirror the transtheoretical stages of change (Prochaska, DiClemente, & Norcross, 1992) and share marked similarities to the temporal changes in voice-hearing and voice-relating reported in other clinical groups (de Jager et al., 2016).

Quantitative studies also indicate that internal voices play a meaningful role in EDs. For example, the EDV has been shown to be related to clinical variables in AN including severity of weight loss, negative attitudes towards food, duration of illness, and the use of compensatory behaviours such as over-exercise (Pugh & Waller, 2016, 2017). In mixed ED groups, critical inner voices have been associated with poorer self-esteem and more dysfunctional attitudes towards shape, weight, and eating (Noordenbos, Aliakbari, & Campbell, 2014), whilst individuals experiencing EDs tend to experience more frequent and distressing internal voices than non-clinical groups (Noordenbos & van Geest, 2017).

Whilst research suggests the EDV is related to disordered eating, the developmental origins of such experiences remain unclear. According to the trauma-dissociation model (TDM) of voice hearing (Longden, Madill, & Waterman, 2012; Moskowitz, Read, Farrelly, Rudegeair, & Williams, 2009), internal voices can represent decontextualized cognitive material arising from early traumatic events which intrude upon conscious awareness due to dissociative processes. In this way, internal voices often represent meaningful embodiments of traumatic events and early interpersonal-emotional conflicts (Corstens & Longden, 2013; Moskowitz & Corstens, 2008). In support of this model, a growing body of research indicates that dissociation is a reliable mediator in the relationship between childhood adversity and voice-hearing in psychosis (e.g., Cole, Newman-Taylor, & Kennedy, 2016; Perona-Garcelan et al., 2012;

Varese, Barkus, & Bentall, 2012).

Research is yet to determine whether the TDM might generalise to voice-hearing in other groups, although its applicability to EDs does seem plausible. Previous studies have identified associations between eating psychopathology and multifarious forms of early trauma (e.g., Caslini et al., 2016). Historically, considerable attention has been paid to the role of childhood sexual abuse (CSA) and childhood physical abuse (CPA) in eating pathology, both of which represent risk factors for the development of EDs (Fullerton, Wonderlich, & Gosnell, 1995; Pope & Hudson, 1992; Welch & Fairburn, 1996). More recent studies have highlighted the role of childhood emotional abuse (CEA) in eating pathology. CEA has been defined as "the sustained, repetitive, inappropriate emotional response to the child's experience of emption and its accompanying expressive behaviour" (O'Hagan, 1995, p.456). CEA appears to be one of the more prevalent forms of childhood abuse, and potentially the most damaging form of maltreatment (Kent & Waller, 2000; O'Hagan, 1993). Research indicates that CEA is particularly prevalent in the EDs (Grilo & Masheb, 2001; Kimber et al., 2017) and has been identified as the form of abuse most clearly related to eating psychopathology (Fischer, Stojek, & Hartzell, 2010; Kennedy, Ip, Samra, & Gorzalka, 2007; Kent & Waller, 2000; Groleau et al., 2012). Whilst precise casual links between CEA and eating pathology remain unclear, cognitive-behavioural models of psychopathology suggest that early emotional abuse, particularly from significant others, may lead to the development of negative core beliefs about the self, others, and the world, which in turn increase vulnerability to psychological disturbance in later life (via self-esteem), including disordered eating (Kent & Waller, 2000). Dissociation is also common across the EDs (Farrington et al., 2002; van Ijzendoorn & Schuengel, 1996) and has been shown to partly mediate the relationship between emotional abuse and eating pathology (Kent, Waller, & Dagnan, 1999; Kong & Bernstein, 2009).

A second issue for research relates to the causal mechanisms underlying the relationship

between the EDV and eating psychopathology. According to the cognitive model of auditory hallucinations (Birchwood & Chadwick, 1997; Chadwick & Birchwood, 1994), voice-related distress is related to subjective appraisals of such events. For example, voices which are perceived as malevolent (i.e., with harmful intent) have been associated with elevated levels of depression and anxiety, whilst voices which are appraised as benevolent (i.e., with benign intent) are more likely to be engaged with (Chadwick & Birchwood, 1994). Regarding relative strength, voices which are perceived as being more powerful than the self are associated with both greater distress (Gilbert et al., 2001) and increased likelihood of acting upon commands (Birchwood et al., 2017). Preliminary research indicates that voice-related appraisals also interact with eating pathology in AN. For example, EDVs which are appraised as more powerful than the self are associated with more unhealthy attitudes towards shape, weight, and eating, whilst lower body mass index (BMI) is associated with voices which have the dual characteristics of being malevolent and powerful (Pugh & Waller, 2016). Whilst these results suggest that beliefs about voices influence eating psychopathology in AN, it is unclear whether they might generalise across other ED diagnostic subtypes.

This cross-sectional study aimed to establish whether cognitive and trauma-related models of voice-hearing (Birchwood & Chadwick, 1997; Longden et al., 2012) apply to experiences of the EDV across ED subtypes. The first hypothesis was that appraisals of the EDV would be related to transdiagnostic eating psychopathology. The second hypothesis was that there would be differences in EDV characteristics across ED diagnoses. The third and central hypothesis of this study was that the perceived power of the EDV would be positively associated with experiences of childhood abuse (namely, childhood emotional abuse), and that this association would be mediated by dissociation.

Method

Ethical approval

Approval for this study was obtained from a National Health Service (NHS) Research Ethics Committee in the United Kingdom (ID: 186963).

Participants

Participants were 85 individuals recruited from a public health service ED clinic. Each fulfilled ICD-10 criteria for an ED diagnosis. Twenty-six (30.6%) met criteria for AN, 30 (35.3%) met criteria for bulimia nervosa (BN), 21 (24.7%) for Other Specified Feeding and Eating Disorders (OSFED), and 8 (9.4%) for binge-eating disorder. Seventy-eight (91.8%) participants were female and the remainder were male. Their mean age was 30.5 years (*SD* = 11.6, range = 18-61). The mean duration of their ED was approximately 9.39 years (SD = 9.85). 74.1% of the sample were of Caucasian ethnicity.

Procedure

Participants completed questionnaire measures either at their assessment or during treatment, which took approximately ten minutes to complete. Participants' weight and height were retrieved from case notes, which were recorded by clinicians in the week prior to data collection. Participants completed a demographic questionnaire regarding their age and ethnicity in conjunction with the following standardised measures.

Measures

Eating Disorders Examination Questionnaire (EDE-Q, version six) (Fairburn, 2008): The EDE-Q is a 28-item self-report measure of eating pathology. The EDE-Q is composed of four subscales measuring ED cognitions (weight concern, shape concern, eating concern, and dietary restriction) (e.g., weight concern subscale: "Have you had a strong desire to lose weight?"). The subscales are used to produce a global, composite score. The frequencies of disordered eating behaviours (e.g., episodes of binge-eating) over the last 28 days are also recorded. The global score was used as the key measure of eating pathology in this study, in conjunction with the measure of eating disorder behaviours. The EDE-Q has demonstrated

acceptable psychometric properties in ED samples, with distinct attitudinal factors, internal consistency, test-retest reliability and clinical validation (Berg et al., 2012; Mond et al., 2004). In this study, the 22 items that contribute to the Global EDE-Q score had a Cronbach's alpha of .949, indicating that they measure a cohesive construct.

Voice Power Differential Scale (VPDS) (Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000): The VPDS is a seven-item self-report questionnaire which measures the perceived power of voices relative to the self, using seven bipolar scales (e.g., "I am much more powerful than my voice" through to "my voice is much more powerful than me"). The questionnaire produces a total score ranging from 7 - 35, with higher scores indicating a voice that is perceived as significantly more powerful than the self. The measure was adapted for this study by replacing the word 'voices' with 'eating disorder voice'. The VPDS demonstrates acceptable psychometric properties in patients diagnosed with psychosis (Birchwood et al., 2000) and adequate internal consistency in individuals diagnosed with AN (Cronbach's alpha = .728; Pugh & Waller, 2016). In this study, the VPDS had a Cronbach's alpha of .749.

Beliefs about Voices Questionnaire, revised (BAVQ-R) (Chadwick, Lees & Birchwood, 2000): The BAVQ-R is a 35-item self-report questionnaire measuring beliefs about voices (their benevolence, malevolence, omnipotence) and responses to voices (engagement and resistance). Only the belief scales were used in this study. Benevolence (Cronbach's alpha in this study = .834) refers to beliefs that internal voices are benign (e.g., "My voice wants to help me"), malevolence (Cronbach's alpha in this study = .640) relates to beliefs that voices are persecutory (e.g., "My voice wants to harm me"), and omnipotence (Cronbach's alpha in this study = .710) refers to beliefs that voices are omniscient and controlling (e.g., "My voice seems to know everything about me"). Responses are recorded on a 4-point scale (scored 0-3), with higher scores indicating greater endorsement of a belief. The BAVQ-R was adapted for this study by changing the term 'voices' to 'eating disorder voice'. The BAVQ-R has

demonstrated acceptable psychometric properties in voice-hearing research (Chadwick et al., 2000) and previous EDV research (Noordenbos et al., 2014; Pugh & Waller, 2016).

Dissociative Experiences Scale - II (DES-II) (Carlson & Putnam, 1993): The DES is a 28-item self-report scale of dissociative symptoms. Participants are asked to rate how frequently each symptom is experienced in daily life (0% - 100%) (e.g., "Some people have the experience of finding themselves in a place and having no idea how they got there"). The DES-II provides three subscale scores (dissociative amnesia, absorption and imaginative involvement, and depersonalization/derealization), although only the total score was used in this study. In this study, the DES-II total score had a Cronbach's alpha of .956. It has demonstrated adequate psychometric properties in other voice-hearing studies (Berry, Fleming, Wong, & Bucci, 2018).

Childhood Trauma Questionnaire (CTQ) (Bernstein & Fink, 1998): The CTQ is a 28-item self-report measure of traumatic childhood experiences. The questionnaire produces five subscales: emotional abuse (Cronbach's alpha in this study =.893), sexual abuse (alpha = .960), physical abuse (alpha = .862), emotional neglect (alpha = .904), and physical neglect (alpha = 731). The CTQ items describe childhood events and participants indicate the extent to which each statement was true during their own upbringing using a 5-point Likert scale (e.g., "I thought that my parents wished that I had never been born"). The CTQ has demonstrated good psychometric properties in both non-clinical (Bernstein et al., 2003) and ED groups (Grilo & Masheb, 2001).

Voice frequency and distress: Participants provided ratings for the frequency of their EDV and voice-related distress. Ratings were made on two separate 10-point visual analogue scales. A score of 10 indicated a voice which was experienced very frequently on the first scale ("I experience my internal eating disorder voice constantly") or which was very distressing on the second scale ("I find the internal voice of my eating disorder highly distressing").

Analyses

The first hypothesis was tested using multiple regression analyses (simultaneous entry method) to determine whether voice characteristics were associated with eating pathology. These analyses were conducted for the whole sample, but were repeated for the AN group only, in case of any distinctive pattern of associations among underweight patients. Hypothesis 2 was tested using a series of one-way ANOVAs (with post hoc Tukey's HSD tests) to compare scores on the 'voice' measures across the four diagnostic groups. Finally, the third hypothesis was tested using Baron & Kenny's (1986) method for testing mediational effects within a multiple regression framework. This method was selected because it is relatively conservative compared to bootstrapping methods. It is acknowledged that it does not test causality within such a cross-sectional design.

Results

Association of eating disorder voice characteristics with eating disorder features

Table 1 shows the association of 'voice' characteristics with ED pathology (BMI; EDE-Q Global scores). For both analyses, eating attitudes (EDE-Q Global scores) were associated with ED 'voice' characteristics overall. For the group as a whole, greater levels of 'voice' Power, Benevolence and Omnipotence were each separately associated with higher levels of eating pathology. There were no links between 'voice' characteristics and BMI in either analysis. However, no individual independent variables were associated with the EDE-Q score for the AN patients, possibly due to the low *N*.

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Insert Table 1 about here

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Differences between diagnostic groups in eating disorder 'voice' characteristics

There were reliable inter-group differences on two of the BAVQ-R scores - Malevolence and Benevolence. The most noteworthy pairwise differences were that the BN group reported relatively high levels of 'voice' malevolence, while the OSFED group reported relatively high levels of 'voice' benevolence.

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Relationship between reported childhood trauma and voice power

A linear regression analysis (simultaneous entry) was used to determine whether the four CTQ scales were associated with 'voice' power. There was a significant overall effect (F[4,80] = 3.35; P = .014; Adjusted R^2 = .103), which was due to a single CTQ scale – emotional abuse (t = 2.77; P = .007; *beta* = .414). In summary, a greater reported history of emotional abuse was the only predictor of the greater strength of ED 'voice' power.

Potential mediating role for dissociation. Having established that a reported history of emotional abuse was associated with 'voice' power, further analyses were conducted to determine whether that relationship might be mediated by a common correlates of emotional trauma – dissociation (DES-total score).

In the first part of the analysis, the association between the CTQ-Emotional score and 'voice' power was tested separately (t = 3.36; P = .001; *beta* = .347). In the second stage, the association between the CTQ-Emotional scale (independent variable) and the DES-total score (mediator) was tested, using regression analysis. In keeping with a mediational model, this association was significant (F[1,83] = 7.72; P = .007; Adjusted R^2 = .075). In the next part of the analysis, it was shown that there was a significant association between the DES-total (mediator) and dependent variable of 'voice' power (F[2,82] = 8.27; P = .005; Adjusted R^2 =

.080).

Finally, the mediator (DES-total) and independent variable (CTQ-Emotional scale) were entered into the equation in that order as forced steps (Baron & Kenny, 1986), to determine whether childhood emotional abuse retained any explanatory power after the proposed mediator of dissociation was included. As before, the first step of the analysis showed that dissociation was significantly associated with 'voice' power. In the second step, the CTQ-Emotional score remained significant (t = 2.67; P = .009; *beta* = .284), but was substantially lower than above. Sobel's test was used to determine whether this change in explained variance was significant. It showed that the amount of variance in 'voice' power explained by the independent variable was reduced significantly (z = 2.09; P = .037).

To summarise, these cross-sectional data are compatible with a model where dissociation is a partial mediator of the relationship between reported childhood emotional abuse and a greater level of ED 'voice' power.

Discussion

As hypothesised, our findings indicated that the relative power of the EDV was related to experiences of childhood emotional abuse, but not other early traumas, and this association was partially mediated by dissociation. To the best of our knowledge, this is the first study to establish links between childhood trauma, dissociation, and internal voices in a clinical group other than individuals with psychotic disorders. In addition, greater relative voice power was related to unhealthier eating attitudes in a mixed ED sample, although there were only limited differences between ED diagnoses.

The main objective of this study was to examine the relationship between childhood trauma and the relative power of the EDV. Supporting our hypotheses, and in line with traumatic-dissociative accounts of voice-hearing (Longden et al., 2012; Moskowitz, Mosquera, & Longden, 2017), EDV power was associated with childhood emotional abuse, but not other

forms of early maltreatment, and this relationship was partly mediated by dissociation. Previous studies exploring links between childhood trauma, dissociation, and other forms of psychopathology have tended to use either global measures of trauma (Cole et al., 2016; Perona-Garcelan et al., 2010) or have examined forms of abuse other than CEA (Kilcommons & Morrison, 2005; Perona-Garcelan et al., 2012). Where CEA has been included in these analysis, it has shown robust associations with psychopathology (Braehler et al., 2013; Schimmenti, 2017; Varese et al., 2012).

Why CEA, but not other forms of childhood trauma, was related to EDV power in this study can be understood in different ways. Previous studies suggest that CEA may be the form of abuse most closely linked to aspects of eating pathology (Kent & Waller, 2000), which may also extend to the internal voices reported by individuals with EDs. In addition, the EDV is often described as aggressive, controlling, and highly critical (Tierney & Fox, 2010), mirroring the experiences of bullying, rejection, humiliation, and verbal aggression that characterise CEA. Viewed in this light, the EDV could be understood as an introjection of these emotionally abusive experiences.

Overall, these findings add to the growing evidence that early adversity may be linked to the development of voice-related experiences across clinical populations (Hammersley et al., 2003; Read, van Os, Morrison, & Ross, 2005; Varese et al., 2012). In addition, they lend support to the hypothesis that internal voices arise from detachment from internal events related to early trauma, which are experienced as alien due to dissociative processes (Longden et al., 2012; Perona-Garcelan et al., 2012). This would suggest that the internal voices reported in EDs are partly memory-based (Smailes, Alderson-Day, Fernyhough, McCarthy-Jones, & Dodgson, 2015), and can be understood within a developmental, interpersonal framework.

The results of this study also corroborate findings regarding the relationship between EDV appraisals and cognitive features of eating psychopathology, insofar as a more powerful

internal voice was associated with more negative eating attitudes (Pugh & Waller, 2016; 2017). Perceived voice benevolence was also related to more pathological eating cognitions. This finding represents a departure from other voice-hearing research, which has linked voice benevolence to lower pathology in other clinical group and control samples (Sorrell, Hayward, & Meddings, 2010). It is likely to reflect the ego-syntonic nature of eating disorders for many individuals, who see the eating disorder as a positive aspect of their lives. As with previous EDV studies, characteristics of the voice were also found to be unrelated to ED behaviours (Pugh & Waller, 2017). However, unlike earlier EDV research in AN, no associations were found between voice characteristics and BMI in this mixed ED sample (Noordenbos & Van Geest, 2017; Pugh & Waller, 2016). This difference might relate to the relatively small number of underweight individuals recruited into present study. Taken together, these findings lend support to the proposal that cognitive models of voice-hearing are relevant in ED groups.

In terms of diagnostic variation, significant differences in EDV appraisals were observed across some ED subtypes. Whilst the frequency, distress, and perceived dominance of the EDV did not vary across the groups, individuals diagnosed with BN tended to experience their EDV as malevolent, whilst individuals with OSFED reported a more benevolent voice. This difference might be because individuals with BN tend to construe their ED in more negative ways compared to other EDs (Serpell & Treasure, 2002), whilst individuals with OSFED report significantly fewer ED-related burdens (Delinsky et al., 2011). Positive appraisals of the EDV might partly explain why readiness to recover can be diminished in OSFED groups (Casasnovas et al., 2007).

Given the preliminary nature of this study, a number of limitations must be acknowledged. First, our sample was self-selecting and the numbers of participants in each diagnostic category were relatively small and uneven, potentially limiting the statistical power of the analysis and the generalisability of the results. These findings require replication,

therefore, using a larger participant group composed of evenly matched diagnostic groups. Whilst participants' primary diagnoses were confirmed by referring clinicians, possible co-morbid dissociative disorders were not assessed for or excluded. Future studies would benefit from incorporating diagnostic instruments to control for potentially confounding comorbidities.

Second, childhood trauma was measured using retrospective questionnaires. Self-report measures of childhood abuse carry risks including inaccurate recall and reinterpretative biases (Longden et al., 2012), which may be compounded by ED-specific factors such as starvation effects. This study also measured a limited range of childhood adversities. Other forms of early trauma such as peer victimisation might also be related to the EDV. Alternatively, it may be that the EDV is most directly related to the chronicity of abuse or multiple traumas. Given that multi-victimisation is a strong predictor of voice-hearing in psychosis (Schreier et al., 2009; Varese et al., 2012), future research should seek to determine whether early trauma exhibits a dose-like effect in regards to the perceived power of the EDV and its impact upon disordered eating.

Third, only the global DES-II score was used in the statistical analyses. Specific dissociative styles linked to eating pathology and voice-hearing such as absorption (Cole et al., 2016; Everill, Waller, & Macdonald, 1995;) were not tested in this study, but may be stronger mediators. Future research may also seek to determine whether other trauma-related factors play a mediating role in the relationship between voice power and abuse in EDs. These may include post-traumatic avoidance and numbing (Hardy et al., 2016), trauma-related rumination and thought-suppression (Jones & Fernyhough, 2009), and negative schematic beliefs originating from early maltreatment (Smith et al., 2006).

Fourth, whilst the voice-related measures used in this study have demonstrated adequate psychometric properties in AN groups, less is known about how they perform in other eating disorder groups (e.g. BN and OSFED). Future research should establish the wider psychometric

properties of these questionnaires across ED subtypes, including their test-retest reliability. It should also be noted that participants in this study were recruited at different time-points (i.e., at assessment or during psychological therapy), which might have influenced our findings. Whilst the psychological therapies undertaken by participants in this study did not include EDV-related interventions, future research could control for possible interactions between psychological intervention and questionnaires scores by recruiting participants prior to any therapeutic intervention.

Finally, the correlational and cross-sectional nature of this study limits inferences regarding causality. Whilst the findings of this study are compatible with the hypothesis that early trauma influences internal voices in EDs through dissociation, other explanations can be postulated. For example, participants' current mental state or disordered eating may increase the risk of dissociative states, influence trauma recall, or impact upon experiences of voice-hearing (Varese et al., 2012). Longitudinal studies would help clarify these issues. It would also be useful to test the utility of bootstrapping methods in testing such mediational models, especially as they are likely to be relatively complex.

The results of this study have implications for treatment. Firstly, our findings suggest that assessing for childhood trauma is indicated in cases where EDVs are described. Unfortunately, many professionals fail to screen for childhood maltreatment in at-risk groups and responses to disclosures can be inadequate (Young, Read, Barker-Collo, & Harrison, 2001). Clinicians should routinely enquire about early traumatic events when working with EDs, particularly if individuals describe distressing and anomalous experiences such as critical internal voices. Whilst clinicians may be adept at exploring certain forms of abuse (e.g., childhood sexual abuse), enquiry should be broadened to include other abusive experiences, including CEA. In addition, clinicians should hold in mind that individuals who have

experienced CEA might not consider themselves as having been abused. Accordingly, exploring these experiences requires detailed and sensitive discussion (Kent & Waller, 2000).

In terms of formulation, the present findings suggest that both the EDV and childhood abuse are relevant (and potentially related) factors in the perpetuation of eating psychopathology (Pugh, 2016; Pugh & Waller, 2016, 2017). Developing explanatory links between childhood adversity and the EDV may help contextualise voice-related experiences, support meaning-making, and bolster personal empowerment. Possible frameworks for situating voice-hearing with biographical contexts include the Maastricht approach (Romme & Escher, 2000), voice dialogue and 'talking with voices' (Corstens et al., 2012), and imagery rescripting (Young, Klosko, & Weishaar, 2003). In addition, formulations should consider how individuals experience and appraise internal voices: EDVs that are perceived as powerful, omnipotent, and benevolent appear to exert a deleterious impact upon eating-related attitudes.

Regarding intervention, cognitive and behavioural strategies for re-examining maladaptive voice-related appraisals have been extensively described (Bryne, Birchwood, Trower, & Meaden, 2006; Chadwick, Sambrooke, Rasch, & Davies, 2000; Meaden, Keen, Aston, Barton, & Bucci, 2013). Dialogical approaches for working with internal voices (e.g., Greenberg et al., 1996; Hayward & Fuller, 2010) may also be an effective means to address voice appraisals, hearer-voice dynamics, and relevant traumatic-interpersonal events. Pugh (2018) has recently outlined a preliminary cognitive-behavioural approach for addressing these treatment targets incorporating motivational interventions (building motivation to change one's relationship with the EDV), dialogical interventions (setting boundaries with the EDV and challenging maladaptive voice instructions), interpersonal interventions (establishing new, supportive relationships with external others), and schema-level interventions (addressing underlying low self-esteem and negative core beliefs arising from early abusive experiences), although this is yet to be formally evaluated. Given that CEA tends to occur within parent-child

relationships, treatments for voice-related experiences may also benefit from systemic interventions. Family-focused interventions which aim to improve communication styles have yielded positive outcomes in EDs and could also be relevant to work with the EDV (Sepulveda, Todd, Whitaker, Grover, Stahl, & Treasure, 2010). Lastly, given that dissociation was related to voice-experiences in our sample, interventions for managing dissociative states such as distraction, grounding, and mindfulness techniques (Kennerley, 1996) might also be helpful.

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Table 1

Multiple regression analyses showing associations of eating disorder 'voice' characteristics with eating characteristics (body mass index[BMI]; eating attitudes [EDE-Q Global score]). Results are presented for the whole group ($N = 85$), and separately for the anorexia nervosa patients ($N = 26$).

Dependent variables	*F (3,81)*	*P*	Adjusted R^2	Significant independent variables	*t*	*P*	*Beta*
Whole sample							
BMI	0.87	*NS*	-.010	-	-	-	-
EDE-Q Global score	11.3	.001	.430	Power	2.06	.05	.221
				Benevolence	2.60	.02	.300
				Omnipotence	2.06	.05	.245
	F (3,22)	*P*	Adjusted R^2	Significant independent variables	*t*	*P*	*Beta*
Anorexia nervosa group							
BMI	0.49	*NS*	-.154	-	-	-	-
EDE-Q Global score	4.95	.004	.497	-	-	-	-

Table 2

Difference between diagnostic groups in eating disorder 'voice' characteristics

		Clinical group				ANOVA		
		Anorexia nervosa	Bulimia nervosa	OSFED	BED	*F(4,80)*	*P*	Tukey's *HSD* tests
N		26	31	21	8			
Frequency	*M*	7.60	7.43	8.33	7.25	0.96	*NS*	-
	(SD)	(1.87)	(2.08)	(2.06)	(2.71)			
Distress	*M*	6.60	6.90	8.19	6.94	1.78	*NS*	-
	(SD)	(2.61)	(2.66)	(1.97)	(2.43)			
Power	*M*	23.8	24.5	25.9	21.9	1.40	*NS*	-
	(SD)	(4.67)	(4.69)	(4.93)	(7.42)			
Malevolence	*M*	8.12	10.6	7.76	9.38	2.93	.04	BN>OSFED=AN
	(SD)	(3.18)	(3.93)	(4.42)	(3.89)			
Benevolence	*M*	4.73	4.41	7.95	1.88	4.66	.005	OSFED>BN=BED
	(SD)	(3.65)	(4.55)	(5.38)	(2.95)			
Omnipotence	*M*	11.2	11.5	11.8	11.6	0.11	*NS*	-
	(SD)	(3.73)	(3.76)	(3.29)	(3.71)			