

**The relationship between personality characteristics and Expressed
Emotion in significant relationships**

Nancy Neath

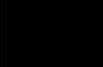
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Thesis declaration form

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signature: 

Name: Nancy Neath

Date: 24/7/2020

Overview

The relationship between Expressed Emotion (EE) and relapse and clinical outcomes in individuals with mental and physical health difficulties is well established. This thesis explores the relationship between EE and individual psychological factors.

Part One is a systematic review of the psychological factors associated with different EE domains in caregivers of individuals with First Episode Psychosis. Fourteen studies met inclusion criteria. The review found that EE-Criticism and emotional over-involvement (EOI) have mutual as well as distinct psychological correlates in caregivers of individuals with a first episode of psychosis, and that these may differ from the correlates of EE found amongst caregivers of individuals with chronic psychosis.

Part Two is an online study investigating personality characteristics that are associated with EE in a non-clinical sample. Two-hundred-and-fifty participants completed measures of EE, self-criticism/ self-reassurance, locus of control, interpersonal functioning and personality. Higher scores on the self-criticism and interpersonal difficulties scales and lower scores on the ability to self-reassure scale were associated with both higher EE-Criticism and EOI. Having a more external locus of control was also associated with higher EOI, and higher EE-Criticism with being less open. This knowledge can be used to identify profiles of caregivers who may benefit from additional, targeted therapeutic interventions. The findings suggest that these personality characteristics warrant further investigation in longitudinal studies looking at the development of EE.

Part Three is a critical appraisal of the research process. It considers issues pertaining to the construct of EE and how they impacted on the thesis. It also reflects on the methodological choices that were made and how things might have been done differently, and puts forward suggestions for future research.

Impact statement

The systemic review synthesises existing evidence on the psychological correlates of high Expressed Emotion (EE) domains in caregivers of individuals who are experiencing their first episode of psychosis (FEP). The findings have several implications for academic research. Firstly, the review found that emotional over-involvement (EOI) and EE-criticism have mutual as well as distinct correlates, emphasising the importance of researchers looking at domain rather than global EE. Doing so will allow us to gain a more nuanced understanding of the processes involved in criticism and EOI. Secondly, the review found a lack of replication of findings across the research, with multiple measures used and constructs investigated, making comparison between studies difficult. Thus it recommends that future research focuses on attempting to replicate existing findings to improve the reliability and validity of the data.

Thirdly, the review found that most studies did not report information regarding participants' cultural background, highlighting the need for researchers to include this data in order to allow for a consideration of how culture might be impacting on the relationship between EE and caregiver psychological factors. This will also allow us to monitor who is being included and who is being underrepresented in psychological research. Fourthly, the review identified a scarcity of studies investigating the psychological correlates of warmth and positive remarks. As warmth may protect against relapse in individuals with FEP, future research should explore these relationships in order to gain insights into the mechanisms involved in these types of caregiving response.

Clinically, the literature review indicates that caregivers of individuals with FEP who are high in EOI may have different needs to caregivers who are higher in criticism. Furthermore, FEP caregivers may have different needs to caregivers of individuals with more longstanding psychosis. An understanding of these differences

can inform treatment guidelines and help ensure that caregivers are not offered a 'one size fits all' approach.

The empirical paper is the first of its kind to investigate what personality characteristics are associated with EOI and EE-Criticism in a non-clinical population, whilst controlling for the impact of physical and mental health variables. In doing so, it seeks to isolate which personality factors may contribute to the development of high EE. It found that self-criticism, being able to reassure oneself, general interpersonal functioning and open mindedness were associated with criticism, whilst self-criticism, being able to reassure oneself, general interpersonal functioning and locus of control were associated with EOI. It suggests that these psychological characteristics may be worthy of further investigation in longitudinal studies looking at the development of EE, to identify whether they make an individual more predisposed to expressing high criticism or EOI when caring for an unwell loved one.

Clinically, the findings from the literature review can contribute to our knowledge of models of caregiving and the different caregiver factors that might contribute to the EE response. In turn, this can foster a more empathic understanding of high EE. Furthermore, the findings suggest that it may be helpful to assess caregiver's self-criticism, general interpersonal functioning, locus of control, and openness, and offer caregivers additional interventions targeted at these areas if needed.

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Part 1: Literature Review

Exploring psychological factors associated with domains of Expressed
Emotion in caregivers of individuals with First Episode Psychosis: A
systematic review

Abstract

Aims: Expressed Emotion (EE) is known to predict relapse in individuals with First Episode Psychosis (FEP) and is often a target of treatment in family and carers interventions. This review aimed to synthesise findings from research that has explored the psychological variables that are associated with Expressed Emotion (EE) domains (criticism, hostility, emotional over-involvement (EOI), warmth and positive remarks) in caregivers of individuals with FEP. Secondly, it aimed to review findings regarding cultural differences in these relationships.

Method: Embase, PsycInfo, MEDLINE and Web of Science were systematically searched for studies reporting the analysis of relationships between at least one EE domain and at least one other caregiver psychological variable.

Results: Fourteen research papers met inclusion criteria and were included in the review. Only one study looked at warmth, positive remarks and hostility. Burden, distress, and use of avoidant coping strategies were associated with both EOI and criticism. However, there was evidence that higher EOI caregivers may experience more distress, including lower self-esteem, than more critical caregivers. More critical caregivers may believe that being critical helps their relatives' symptoms, and may attribute the cause of psychosis to family factors. Only four studies reported data relating to the cultural background of participants, rendering it impossible to conduct any meaningful analysis of cultural variation in the findings.

Conclusions: EE-Criticism and EOI have mutual as well as distinct psychological correlates in caregivers. FEP caregivers who are higher in EE-Criticism or EOI may have different needs to more chronic psychosis caregivers who are higher in these domains. Researchers should report data relating to the cultural background of participants to allow for a consideration of how culture might be impacting on these relationships. Implications for clinical practice and directions for further research are discussed.

Introduction

Expressed Emotion (EE) is a psychological construct that describes the quality of the interpersonal relationship between a caregiver and the individual that they care for (Amaresha & Venkatasubramanian, 2012). High EE; when a caregiver responds critically, with hostility, and/ or in a way that is emotionally over-involved (EOI), has shown to correlate with relapse and clinical outcomes across a range of physical and mental health difficulties, including both chronic and First Episode Psychosis (FEP) (Ahmad et al., 2017; Butzlaff & Hooley, 1998; Koutra et al., 2015; O'Driscoll et al., 2019; Wearden et al., 2000; Weintraub et al., 2017). There is now international agreement that early intervention is critical to improve outcomes for individuals with psychosis (McGorry et al., 2008). Therefore, understanding what caregiver psychological factors predict EE may be of importance in helping prevent relapse and reducing the likelihood of an individual's psychosis becoming chronic. Increasingly, attention has been given to how the various components of EE affect psychosis outcomes differently, particularly across cultures (Hashemi & Cochrane, 1999; Singh et al., 2013).

Background to Expressed Emotion

The EE construct developed from studies by Brown and colleagues in the late 60's and 70's in the United Kingdom (UK) that followed up individuals with psychosis after they were discharged from hospital. They found that those who returned to live with relatives who were critical, hostile, or emotionally over-involved ('High EE'), were more likely to relapse than those returning to live with relatives who demonstrated these characteristics less frequently ('Low EE') (Brown et al., 1972). EE was originally measured using the Camberwell Family Interview (CFI) (Vaughn & Leff, 1976), which scored relatives on five domains: criticism, hostility, emotional over involvement (EOI), warmth and positive remarks. A classification of either low or high EE is made based on the criticism, hostility and EOI domains

(Hooley & Parker, 2006). However, self report measures of EE developed since the CFI tend to be based on criticism and EOI only (Hooley & Teasdale, 1989; Kavanagh et al., 1997; Kreisman et al., 1979; Wiedemann et al., 2002), as the hostility and criticism domains overlap conceptually and are highly correlated (Hooley, 1998). As initial findings indicated that warmth and positive remarks did not correlate with relapse, these domains were historically less studied (Hooley, 1985). However, more recently researchers have found that caregiver warmth may protect against relapse in individuals with psychosis (Butler et al., 2019; Lopez et al., 2004), even in the presence of high EE (Lee et al., 2014).

Over fifty years of research has provided evidence of a robust relationship between high EE and relapse amongst individuals with psychosis (Bebbington & Kuipers, 1994; Butzlaff & Hooley, 1998; Cechnicki et al., 2013; Kavanagh, 1992; O'Driscoll et al., 2019). Within FEP research, initial findings suggest that the criticism domain, rather than overall EE, is associated with relapse in this population (Alvarez-Jimenez et al., 2012; Koutra et al., 2015). More recently, Haidl and colleagues (2018) found that the onset of psychosis in a group of individuals who were considered to be 'clinically high risk' for developing psychosis was predicted by the extent to which the individuals perceived their caregiver to be irritable, a domain on the Level of Expressed Emotion Scale (LEE) (Cole & Kazarian, 1988).

Psychological factors associated with Expressed Emotion in caregivers of individuals with chronic psychosis

Much of our knowledge about the psychological correlates of EE comes from research of caregivers of individuals with chronic psychosis. High EE relatives have been found to be more conventional, self-critical and less flexible than low EE relatives (Docherty et al., 1998; Hooley & Hiller, 2000). Higher EE has also been linked with greater perception of burden (Scazufca & Kuipers, 1996; Wang et al., 2017), distress, and negative illness perceptions (Gómez-de-Regil et al., 2014;

Kageyama & Solomon, 2018). Furthermore, Grice et al. (2009) found that high EE caregivers were more likely to attribute negative events, and less likely to attribute positive events, to the individuals who they cared for.

The relationship between domain level EE and psychological factors in caregivers of individuals with chronic psychosis has also been explored. In regards to cognitive mechanisms that may underpin EE, critical and/ or hostile caregivers are more likely to believe that the individual who they care for is able to control their symptoms (Barrowclough et al., 1994; Brewin et al., 1991). Furthermore, Hooley (1998) found that more critical caregivers were more likely to have a higher internal locus of control. Taken together, these findings may suggest that relatives who believe that they are able to control their own behaviour are more likely to assume that others can do the same, which may result in them criticising the individual they care for when they do not change their behaviour.

In terms of personality characteristics, caregivers who are higher in criticism may be less likely in general to feel guilty for showing hostility towards others (Bentsen et al., 1998), have lower self-esteem, and use avoidant coping strategies (Kuipers et al., 2006). Meanwhile, caregivers who score higher on EOI may be more likely to show more controlling behaviours, blame themselves for their relative's illness (Peterson & Docherty, 2004) and have a general tendency towards guilt and self-punishment (Bentsen et al., 1998). Maternal caregivers who are higher in EOI may be more conscientious (King et al., 2003).

Findings from studies such as these have contributed to models that seek to explain variation in the caregiving response. For example, Kuipers et al. (2010) propose that caregiver's behaviour towards the individual they care for (including EE behaviours) is the result of their pre-existing illness appraisals and relationship dynamics with the individual who they care for. These factors then impact on how the caregiver appraises their relatives behaviour, resulting in particular cognitive and emotional changes in the caregiver which lead them to respond in a certain way to

the individual with psychosis. However, the large majority of the research informing this model comes from studies of caregivers of individuals with chronic psychosis. It is less clear whether the same processes would apply for FEP caregivers.

Research looking at relationships between EE and caregiver factors paved the way for the development of interventions involving relatives, such as Family Intervention for Psychosis (FIP) (Barrowclough, 1997; Glynn, 2012; Kuipers et al., 2002; Leff et al., 1992) and Carers Interventions (Onwumere et al., 2018; Roddy et al., 2015) which partly aim to reduce hostility, criticism, and EOI (Pharoah et al., 2010). Kuipers and colleagues recommend that interventions for caregivers presenting as higher in EOI focus on enabling them to reengage with their own lives and reduce stress. They also advocate using problem-solving to help such caregivers identify areas where the individual with psychosis is able to be more independent. On the other hand, for caregivers presenting as higher in criticism or hostility, they recommend that interventions focus on providing psychoeducation and challenging beliefs about illness controllability. They also advise that interventions explore the impact of the illness and current communication patterns on both the caregiver and the individual with psychosis, teach problem-solving techniques and more helpful coping styles, and strategies to improve self-esteem (Kuipers et al., 2010).

Cultural variation in Expressed Emotion

The expression of EE and its impact on the unwell family member varies across cultures (Hashemi & Cochrane, 1999; O'Driscoll et al., 2019). For example, a review by Singh and colleagues found that the relationship between high EOI and poorer outcomes is not consistent across cultures (Singh et al., 2013). Furthermore, amongst African Americans, behaviour from relatives that is coded as critical or intrusive may actually be associated with better outcomes (Rosenfarb et al., 2006a). In response to this finding, Rosenfarb et al. (2006b) proposed a socio-cultural model

of caregiving. This includes how cultural factors influence relatives' perceptions of burden and resulting attitude and behaviours towards the individual that they care for, as well as acknowledging how the individual's symptoms affect the caregivers' appraisal. There is now a greater awareness of the need for FI and caregiver interventions to adapt to different cultural norms for caregiving (Onwumere et al., 2009; Smith et al., 2020).

First Episode Psychosis caregivers

Research indicating that intervening early leads to better outcomes for people with psychosis (Birchwood & Macmillan, 1993) led to the creation of EI Services globally (McGorry et al., 2008). FIp and Carers Interventions now form part of the recommended treatment for FEP internationally (National Institute for Health and Care Excellence [NICE], 2014; World Health Organisation [WHO], 2012) and have had promising results. Findings from systematic reviews indicate that FIp improves service user functioning, reduces relapse rates, duration of hospitalization and symptoms of psychosis, and reduces caregiver criticism and hostility, but not EOI (Camacho-Gomez & Castellvi, 2020; Claxton et al., 2017).

Caring for someone during the early and later stages of psychosis will be associated with different experiences. Indeed, since the advent of the EI model, there has been a growing focus on the particular experience of FEP caregivers and recognition of the challenges that come with making sense of a loved ones illness and adjusting to the change in role from partner or family member to caregiver (Aengibise et al., 2015; Dillinger & Kersun, 2019; Mui et al., 2019; Onwumere et al., 2011). On the other hand, some researchers have compared FEP and chronic psychosis caregivers and found that FEP caregivers experience less burden and emotional distress, and are less critical of the individual with psychosis, than chronic psychosis caregivers (Koutra et al., 2014b; Sagut & Çetinkaya, 2016). Furthermore, the fact that EOI is not associated with relapse in individuals with early psychosis

(Alvarez-Jimenez et al., 2012; Koutra et al., 2015) suggests that it is not experienced as unhelpful by the service user, which is likely to influence the caregiving relationship. Taken together, these findings suggest that FEP caregivers may have distinct experiences from chronic psychosis caregivers, and that different psychological processes may therefore drive the EE response. However, compared with caregivers of individuals with chronic psychosis, comparatively less is known about what psychological factors in FEP caregivers are associated with EE.

Systematic reviews of research with FEP caregivers have found that similarly to chronic psychosis caregivers, high EE is related to attributions about the relative's illness (Koutra, Vgontzas, Lionis, & Triliva, 2014). A strong association between higher EOI and distress has also been found (Jansen, Gleeson, et al., 2015). However, neither review focused directly on exploring relationships between EE and psychological factors in FEP caregivers.

Rationale and aims of present study

Providing the right support to caregivers of individuals with FEP is an important part of the EI approach. FIP and carers interventions aim to improve outcomes for both service users and caregivers by targeting unhelpful patterns of thinking, behaviour, and communication that contribute to high EE and distress in caregivers (Kuipers et al., 2002; Onwumere et al., 2018). However, to the best of the authors knowledge, no previous reviews have been conducted that identify the psychological variables that are associated with EE in caregivers of individuals with FEP. The review will focus on FEP caregivers as it seeks to gain a greater understanding of the psychological correlates of EE at the point at which caregivers and individuals with FEP are at the early stages of adapting to the psychosis, rather than caregivers who have had to cope with a chronic difficulty. It will also explore whether studies have found cultural differences in these relationships. Furthermore, as research from the chronic psychosis literature indicates that EE domains are

associated with different caregiver factors and affect outcomes differently, the present review will focus on relationships between domain EE and caregiver psychological variables.

The knowledge gained from this review will be important for several reasons. Firstly, having a more nuanced understanding of how psychological factors in FEP caregivers relate to EE domains can provide additional targets for interventions that aim to reduce EE and caregiver distress. This knowledge could be used to inform idiosyncratic formulations that help ensure that the support offered is tailored to the specific needs of the caregiver. Secondly, it will help us to identify similarities and differences between the psychological correlates of EE in FEP and chronic psychosis caregivers, and the potentially differing needs of these two caregiving groups. Thirdly, it may help us to understand more about why some caregivers of individuals with FEP express high EE and others do not, and fourthly, it may give us insights into the possible functions of EE in FEP. The aim of this review will be to address the following questions:

- 1.) Which psychological factors in caregivers of individuals with FEP are associated with caregiver EE domains (criticism, hostility, EOI, warmth, and positive remarks)?
- 2.) If relationships exist, do they differ between cultures?

Method

Eligibility criteria

Inclusion criteria

- 1.) Studies involving informal carers of individuals with FEP
- 2.) Studies using quantitative data to explore whether there is a relationship between at least one EE domain and at least one other measure of a caregiver psychological factor

3.) Studies written in English.

Exclusion criteria:

- 1.) Studies that only report overall EE
- 2.) Studies that only report a measure of EE completed by the individual with FEP
- 3.) Studies that only included carers of individuals described as “prodromal”, “ultrahigh risk” (UHR), or “at risk mental state” (ARMS)
- 4.) Studies where FEP is secondary to an organic disorder such as dementia
- 5.) Unpublished studies (e.g. conference abstracts, posters and dissertations)
- 6.) Grey literature
- 7.) Single case studies
- 8.) Review studies
- 9.) Books

In cases of intervention or longitudinal studies where a relationship between EE and another caregiver variable is measured at more than one time point, only the baseline data was included in this review. Two studies were found that reported only the combined data from FEP caregivers with data from caregivers of individuals from other diagnostic groups (Domínguez-Martínez et al., 2017; Möller-Leimkühler, 2005). The authors of these studies were contacted to find out if they had data available that isolated the FEP caregiver’s data from the data from caregivers of individuals from other diagnostic groups. In both cases, the authors responded to say that they did not have this data available. Two studies were found that reported only total rather than domain level EE data. Again, the authors of these studies were contacted to find out if the domain level data was available. In one instance the authors responded to say that they had not conducted analyses at the domain level and that their sample was too small to have enough power to conduct post hoc analyses of the domain level data (Raune et al., 2004). The authors of the fourth study did not respond (Sadath et al., 2017). All four studies were excluded.

As the definition of FEP can vary across services, no definition of FEP was imposed. It was decided not to include carers of individuals described as “prodromal”, “ultrahigh risk” (UHR), or “at risk mental state” (ARMS) due to the diagnostic uncertainty of these groups, with roughly two thirds of individuals identified as being at high clinical risk *not* transitioning to psychosis within a three year follow-up window (Fusar-Poli et al., 2012).

Search strategy

Embase, PsycInfo, MEDLINE and Web of Science were systematically searched for records published from database inception to 25th October 2019. The following search terms were used, although the terms varied slightly according to the specific database: terms related to “first episode psychosis” (‘first episode psychos#s’ OR ‘recent onset psychos#s’ OR ‘early onset psychos#s’ OR ‘first psychotic episode’ OR ‘recent onset psychotic episode’ OR ‘early onset psychotic episode’ OR ‘early psychos#s’ OR ‘first onset psychos#s’), caregiver (caregiv* OR carer* OR family OR families OR relative* OR parent* OR partner* OR spouse* OR sibling* OR caring), Expressed Emotion (‘Expressed emotion’ OR Hostil* OR Criticism* OR overinvolve* OR ‘over-involve*’ OR overprotect* OR ‘over-protect*’ OR critical OR intrusive OR warmth OR ‘positive comment*’ OR ‘positive remark*’) and caregiver psychological factors (distress* OR burden* OR ‘well-being’ or wellbeing OR stress* or depress* OR mood OR anxiet* OR anxious OR loss OR grief OR guilt OR PTSD OR ‘post traumatic stress*’ OR ‘quality of life’ OR burnout OR impact OR coping OR attribution OR attachment OR metacognition OR ‘metacognitive belief*’ OR appraisal OR ‘illness perception*’ OR illness belief* OR adaptab* OR ‘problem solv*’ OR stigma OR flexibility OR acceptance OR personalit* OR ‘social cognition’ or ‘utility beliefs’ OR ‘family cohesion’). The terms used for caregiver psychological factors were chosen based on findings from previous literature reviews and from a scoping search of the literature. The Boolean

operator “AND” was used to combine the four search term categories. Additional references were obtained from reviewing the reference lists of relevant reviews.

Article selection

The titles and abstracts of articles identified from the initial search were screened for eligibility and duplicates were removed. Selected papers were then read and screened against the inclusion/ exclusion criteria. The full study selection and exclusion process is outlined in Figure 1.

Data extraction and analysis

The following data were extracted: 1.) Study characteristics e.g. study design, country the study took place in, where participants were recruited from, and number of participants 2.) Demographic information about the caregiver sample such as definition of caregiver used in the study/ eligibility criteria, age, sex, relationship to patient, socio-economic status, employment status, and any reference to the cultural background of the participants (i.e. ethnicity, nationality etc.) 3.) Whether or not they live with the individual with FEP and the amount of contact they have with them 4.) EE measure used, domains assessed and baseline EE domain data 6.) Relationship between EE domains and any additional measures of caregiver psychological processes. This data was then synthesized into a narrative review. Due to the heterogeneity of dependent variables studied and outcome measures used, it was not possible to conduct a meta-analysis.

Quality assessment tool

The quality of each paper was critically appraised using the Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields (Kmet, 2004). This tool was selected as it can be used flexibly to evaluate different study designs. The papers were reviewed by the author and a second reviewer. Any discrepancies in ratings were discussed until an

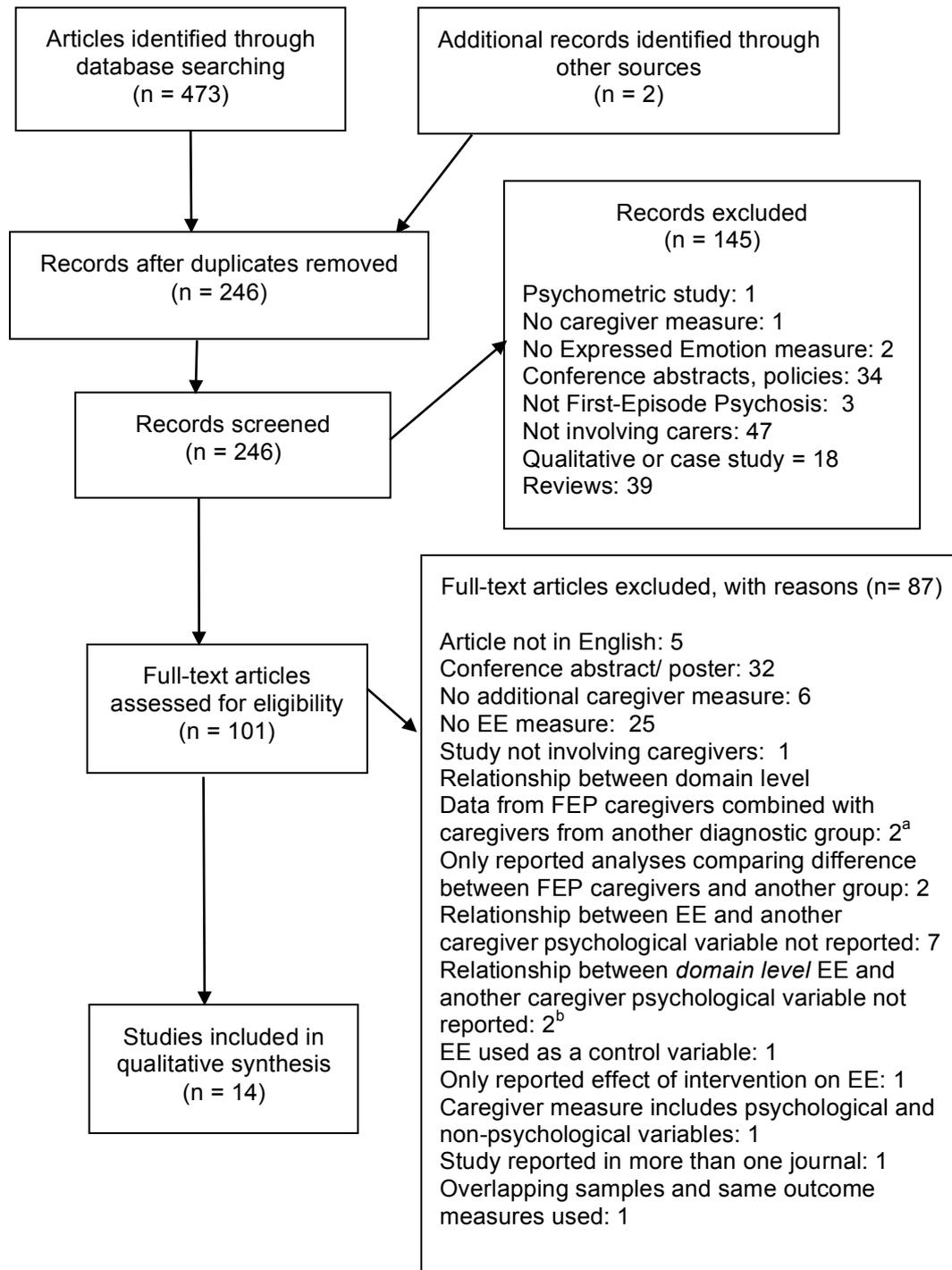


Figure 1. Flow diagram of the study selection process

Note. ^a The authors of these studies were contacted to find out if they had the data available for the FEP group only. ^b The authors of these studies were contacted to find out if they had data available for the relationship between domain level EE and the caregiver psychological variable that they were studying.

agreement was reached. Papers were rated as 'yes', 'no', 'partial' or 'not applicable' in regards to the extent to which they fulfilled each of the assessment tools criteria.

Results

Fourteen papers (from 12 different studies) that met eligibility criteria were included. Three of these papers came from the same larger study, and so might have had overlapping samples (Jansen, Haahr, et al., 2015; Jansen, Harder, et al., 2015; Jansen et al., 2014) although each paper reported on distinct variables and had different sample sizes. There was one case where two papers from the same larger study reported the relationship between EE and the same outcome measures (Jansen et al., 2014; Jansen et al., 2017). Only the paper with the larger sample of the two was included in the review (Jansen et al., 2014).

There were two instances where it was unclear if studies met the inclusion criteria that domain level EE data is reported. In one instance, the Family Attitude Scale (FAS) (Kavanagh et al., 1997) was reported in one study as a measure of EE (Tomlinson et al., 2014) and in another study as a measure of criticism (Hamaie et al., 2016). As the FAS was originally designed to measure criticism and does not include items that tap into EOI, it cannot be considered a measure of global EE. Furthermore, the FAS correlates with CFI criticism and hostility ratings but not CFI EOI ratings (Kavanagh et al., 1997). Thus the FAS was considered a measure of criticism for the purpose of this review.

Similarly, the Patient Rejection Scale (PRS) (Kreisman et al., 1979) was used in one paper as a measure of criticism (Brent et al., 2011) and in another paper it was described as a measure of the extent to which relatives showed rejecting attitudes towards the patient, whilst the paper also highlighted it as an analogue measure of criticism and hostility (Hinrichsen & Lieberman, 1999). Again both papers were included and the Patient Rejection Scale (PRS) was treated as a measure of criticism, as the scale was originally designed to overlap conceptually

with the criticism and hostility components of EE, but not the EOI component (Kreisman et al., 1979).

Quality assessment of included studies

Three items on the tool (items five to seven) were rated as 'not applicable' for all papers included in the review as they were only relevant to assessing bias in intervention studies. All the papers scored 77% or above on the quality assessment tool. Each paper provided a clear and appropriate study design, used objective outcome measures, reported the results in sufficient detail, reported an estimate of variance, and drew conclusions that were supported by the results. Nearly all of the papers (k = 13) clearly described the aims of the study and participant selection methods and most of the studies adequately described the statistical analyses used (k = 12).

In regards to the reporting of participant demographic information, ten studies were rated as having incomplete demographic information as they did not report any information related to the cultural background of participants such as ethnicity, country of origin or migration status. Furthermore, as none of the studies reported whether they used power calculations to decide their sample size or whether they controlled for multiple testing, there was not enough information to decide whether the sample sizes were adequate (item 9 on the quality assessment tool) and consequently all were rated as only partially meeting this criterion. This meant that it was difficult to assess the statistical robustness of the findings from the studies. However, in the studies that used small sample sizes (e.g. Brent et al., 2011; Gonzalez-Blanch et al., 2010; Jansen et al., 2014; Tomlinson et al., 2014) it is possible that there was not enough power to detect significant relationships between variables.

Only five studies were rated as having adequately controlled for potentially confounding variables such as service user symptoms, relationship type, or

participant demographics, whilst three studies were rated as having not controlled for potentially confounding variables at all. The remaining studies ($k = 6$) were rated as 'partially' meeting this criterion. However, it is important to note that in some instances these studies may have adequately controlled for confounding variables in their main analyses, just not in their analyses of the data that the present review was interested in. See appendix 1 for table of results from the quality assessment.

Study characteristics

Of the fourteen papers reviewed, ten employed a cross-sectional study design and four were prospective (Alvarez-Jimenez et al., 2010; Gonzalez-Blanch et al., 2010; Jansen et al., 2014; Patterson et al., 2005). The sample sizes across papers were variable, ranging from 14 – 154 participants. One study was conducted in Brazil (Zanetti et al., 2018), two in the United States of America (USA) (Brent et al., 2011; Hinrichsen & Lieberman, 1999), one in Spain (Gonzalez-Blanch et al., 2010), three in England (Patterson et al., 2005; Tomlinson et al., 2014; Vasconcelos et al., 2013), one in Japan (Hamaie et al., 2016), one in Denmark, which generated three of the research papers included in this review (Jansen, Haahr, et al., 2015; Jansen, Harder, et al., 2015; Jansen et al., 2014) and three in Australia (Alvarez-Jimenez et al., 2010; Cotton et al., 2013; McNab et al., 2007).

The majority of the studies ($k = 10$) recruited caregiver's of individuals being seen within specialist FEP services. Two studies recruited relatives of individuals who were currently receiving treatment in an inpatient unit or who were being seen by a Home Treatment Team (Hinrichsen & Lieberman, 1999; Patterson et al., 2005).

Sample characteristics

Amount of contact between caregiver and individual with FEP

Studies differed greatly in their eligibility criteria (see Table 1). Five studies specified a minimum amount of contact that the caregivers had to have with the

individuals with FEP in order to be eligible to take part (Brent et al., 2011; Gonzalez-Blanch et al., 2010; Hinrichsen & Lieberman, 1999; Tomlinson et al., 2014; Vasconcelos et al., 2013), ranging from daily contact (Gonzalez-Blanch et al., 2010) to once weekly (Hinrichsen & Lieberman, 1999). Only one study noted that the contact could include telephone calls (Tomlinson et al., 2014).

It is possible for two individuals to live together, but to have very little regular contact with one another. However, only six of the fourteen papers reported both whether or not the participants were living with the individual that they cared for, and the amount of contact that they had with one another (Alvarez-Jimenez et al., 2010; Hinrichsen & Lieberman, 1999; Jansen, Haahr, et al., 2015; Jansen, Harder, et al., 2015; Jansen et al., 2014; Zanetti et al., 2018). Excluding studies where living with the patient was a prerequisite for participation, data on whether or not the participants were living with the patient was available from ten papers (Alvarez-Jimenez et al., 2010; Brent et al., 2011; Cotton et al., 2013; Gonzalez-Blanch et al., 2010; Hamaie et al., 2016; Hinrichsen & Lieberman, 1999; Jansen, Haahr, et al., 2015; Jansen, Harder, et al., 2015; Jansen et al., 2014; McNab et al., 2007; Patterson et al., 2005). Across these studies, the majority of participants were living with the individual with FEP. Two studies controlled for whether or not the caregiver and individuals with FEP were cohabiting in their analyses (Hinrichsen & Lieberman, 1999; Jansen, Haahr, et al., 2015).

Eight papers reported the amount of contact between participants and the individuals with FEP (Alvarez-Jimenez et al., 2010; Hinrichsen & Lieberman, 1999; Jansen, Haahr, et al., 2015; Jansen, Harder, et al., 2015; Jansen et al., 2014; McNab et al., 2007; Vasconcelos et al., 2013; Zanetti et al., 2018), and three controlled for amount of contact time in their analyses (Hinrichsen & Lieberman, 1999; McNab et al., 2007; Vasconcelos et al., 2013). It was difficult to compare between papers as contact time was recorded differently across studies. However, variation was evident, with amount of contact ranging from 16.7 hours per day in

one sample (Zanetti et al., 2018) to 'at least one hour per week' in another study (Jansen, Haahr et al., 2015).

Type of relationship

There was variation in the type of relative recruited to the studies (see Table 1). Seven papers (Alvarez-Jimenez et al., 2010; Hamaie et al., 2016; Hinrichsen & Lieberman, 1999; Jansen, Harder, et al., 2015; Jansen et al., 2014; Jansen et al., 2017; McNab et al., 2007; Patterson et al., 2005; Tomlinson et al., 2014; Zanetti et al., 2018) required that the caregiver be a relative or spouse of the patient, including one paper that recruited parents exclusively (McNab et al., 2007). Parents made up more than 70% of the sample across studies. Additional relationship types featured in the samples included step-parent, grandparent, 'other blood relative', and 'other'.

Demographic information

Across the nine studies that reported gender, females made up between 60% and 100% of the samples (Brent et al., 2011; Cotton et al., 2013; Gonzalez-Blanch et al., 2010; Jansen, Haahr, et al., 2015; Jansen et al., 2014; McNab et al., 2007; Tomlinson et al., 2014; Vasconcelos et al., 2013; Zanetti et al., 2018). The average age of participants ranged from 42 to 54 years old. Information regarding participants level of education, employment status, and socio-economic status can be found in Table 1.

Table 1:

Eligibility criteria and participant demographic information from reviewed studies

Author (year) and country	Recruited from	n	Study eligibility criteria			Participant demographics								
			Min. contact with SU	Had to be living with SU? (Y/N)	Type of relation required	Relation to SU: % (n)	Living with SU: % (n)	Average amount of contact with SU: % (n)	Age: M	Education	Employment status: % (n)	Income/ SES: % (n)	% Male (n)	Cultural variability
Alvarez-Jiminez et al. (2010). Australia	FEP Service	63	'Frequent contact'	N	-	Spouse: 8% (5) Parent: 87% (55) Sibling: 3% (2) Grand-parent: 2% (1)	87% (55)	Daily contact: 86% (54) > 1 x weekly contact: 14% (9)	44	-	Employed: 76% (48)	-	-	-
Brent et al. (2011). USA	Mental Health Centre	14	16 hours per week	N	-	Mother: 43%(6) Father: 29% (4) Sister: 21% (3) Brother: 7% (1)	93% (13)	-	42	Years (Av): 13.7	-	-	36% (5)	-
Cotton et al. (2013). Australia	FEP Services	124	-	N	-	Parent: 91% (113)	82% (102)	-	47	No qualifications: 5% (6) High school qualifications: 36% (44) TAFE: 22% (27) Tertiary education: 38% (47)	Employed: 79% (95)	Yearly household income ^a : < \$20,000: 15% (18) \$20,000–\$50,000: 38% (46) \$51,000–\$100,000: 33% (39) > \$100,000: 14% (17)	18% (22)	35% not born in Australia. This group had lived in Australia for an average of 29 years. 8% (11) had a primary language other than English ^b

Author (year) and country	Recruited from	n	Study eligibility criteria			Participant demographics								
			Min. contact with SU	Had to be living with SU? (Y/N)	Type of relation required	Relation to SU: % (n)	Living with SU: % (n)	Average amount of contact with SU: % (n)	Age: M	Education	Employment status: % (n)	Income/ SES: % (n)	% Male (n)	Cultural variability
Gonzalez-Blanch et al. (2010) Spain	Clinical and research program	23 ^c	Daily	N	-	Mother: 65% (15) Father: 17% (4) Sibling: 13% (3) Couple: 4% (1)	83% (19)	-	5	-	Employed: 44% (10) Studying: 22% (5) Incapacity for work: 13% (3) Unemployed: 17% (4) Disability pension: 4% (1)	Low: 13% (3) Medium: 78% (18) High: 9% (2)	26% (6)	-
Hamaie et al. (2016) Japan	FEP service	43	-	N	Relative	Father: 12% (5) Mother: 81% (35) Sibling: 2% (1) Spouse: 5% (2)	81% (35)	-	49	Years (Av): 13	-	-	-	-
Hinrichsen and Lieberman (1999) USA	Inpatient service	63	Once per week	N	Bio-logical relative or spouse	Father: 18% (11) Mother/stepmother: 56% (35) Sibling: 11% (7) Spouse: 10% (6) 'other': 6% (4)	84% (53)	Average face to face contact in past month: 26.35 hours (SD = 23.38)	Mostly middle aged	-	-	Mean Index of Social Class position: 39.65 (SD = 11.23), "placing them within the 'skilled craftsman, clerical, sales-worker' social stratum"	-	Reported for service users only (White: 43% Black: 38% Hispanic/Asian/ 'other': 19%)

Author (year) and country	Recruited from	n	Study eligibility criteria			Participant demographics								
			Min. contact with SU	Had to be living with SU? (Y/N)	Type of relation required	Relation to SU: % (n)	Living with SU: % (n)	Average amount of contact with SU: % (n)	Age: M	Education	Employment status: % (n)	Income/ SES: % (n)	% Male (n)	Cultural variability
Jansen, Haahr et al. (2015) Denmark	FEP service	154	-	N	-	Parent: 81% (124) Stepparent: 5% (8) Sibling: 3% (4) Spouse: 6% (9) 'other': 6% (9)	57% (88)	>1 hour face-to-face contact per week: 84% (129)	49	-	Employed: 71% (110)	'Both higher and lower socio-economic classes were well represented'	38% (58)	-
Jansen, Harder, et al. (2015) Denmark	FEP Service	127	-	N	Relative	Parent: 80% (102) Partner: 4% (5) Step-parent: 6% (7) Grandparent: 2% (3) Sibling: 3% (4)	57% (72)	Weekly contact: 84% (107)	50	-	-	-	-	-
Jansen et al. (2014) Denmark	FEP service	40	-	N	-	Parent: 88% (35) Spouse: 8% (3) Stepparent: 5% (2)	70% (28)	≥1 hour per day face to face contact: 70% (28)	-	-	-	-	40% (16)	-

Author (year) and country	Recruited from	n	Study eligibility criteria			Participant demographics								
			Min. contact with SU	Had to be living with SU? (Y/N)	Type of relation required	Relation to SU: % (n)	Living with SU: % (n)	Average amount of contact with SU: % (n)	Age: M	Education	Employment status: % (n)	Income/ SES: % (n)	% Male (n)	Cultural variability
McNab et al. (2007) Australia	FEP Service	53	-	N	Parents	Mother: 66% (35) Father: 30% (16) Step father: 4% (2)	83% (44)	Not living with service user but saw them 'regularly': 9% (5) Seeing the service user irregularly: 8% (4)	49	No qualifications: 36% (19) Trade certificate/apprenticeship: 23% (12) Completed high school: 19% (10) Completed undergraduate degree: 9% (5) Completed postgraduate degree: 13% (7)	-	-	34% (18)	'All families spoke English at home'
Patterson et al. (2005) England	Inpatient units or HTT	50 ^d	Cohabiting or regular contact	N	Relative	Parent: 77% (30) Partner: 15% (6) Sibling: 8 (3)	86% (34). 14% (7) saw relative 3 times weekly (Av.)	-	44	-	-	-	-	Reported for service users only (White = 72% (28), Asian = 15% (6) and 13% = Black or mixed race (5))

Author (year) and country	Recruited from	n	Study eligibility criteria			Participant demographics								
			Min. contact with SU	Had to be living with SU? (Y/N)	Type of relation required	Relation to SU: % (n)	Living with SU: % (n)	Average amount of contact with SU: % (n)	Age: M	Education	Employment status: % (n)	Income/ SES: % (n)	% Male (n)	Cultural variability
Tomlinson et al. (2014) England	FEP service	24	10 hours per week (including phone calls)	N	Relative	Father: 7% (4) Mother: 83% (20)	-	-	52	No qualifications: 8% (2) GCSE/O Level: 23% (5) A-Level/NVQ: 9% (2) Higher Education: 54% (13)	Unemployed: 8% (2) Full time: 67% (16) Part time/ other: 25% (6)	-	17% (4)	White British: 21% (5) Black/ Black British: 63% (15) Asian/ Asian British: 8% (2) Other: 8% (2)
Vasconcelos et al. (2013) England	FEP Service	80	10 hours per week	N	-	Mother: 68% (54) Father: 11% (9) Step father: 1% (1) 'Other blood relative': 4% (3) Unrelated carer: 1% (1) Partner: 15% (12)	-	32 hours per week (range: 7-84 hours)	46	Years (Av): 13	Unemployed: 32% (25) Employed: 65% (51) Retired: 4% (3)	-	21% (17)	White: 85% (67) Black: 4% (3) Asian: 4% (3) Mixed 5% (4) 'Other': 3% (2)
Zanetti et al. (2018) Brazil	FEP service	71	-	Y	Relative	Mother: 55% (39) Spouse: 18% (13) 'Other': 27% (19)	-	16.7 hours per day	46	Years (Av): 6.25	-	-	14% (10)	-

Note. - = data not reported. SU = service user. Av = Average. HTT = Home Treatment Team. TAFE = Technical and further education^a Income in Australian dollars^b Other primary languages included Albanian, Vietnamese, Oromo, Punjabi, Tamil and Turkish.^c Demographic information based on 23 participants. However only 19 participants were included in the EE analysis due to missing data.^d Demographic information based on the 39 participants who also completed the follow up part of the study. The authors note that the group who dropped out did not differ significantly from the group who completed follow up on demographic measures.

Participant's cultural background

Only four studies (Cotton et al., 2013; McNab et al., 2007; Tomlinson et al., 2014; Vasconcelos et al., 2013) reported demographic information related to the participants cultural background, making any meaningful analysis difficult. These studies recorded either participants ethnicity (Tomlinson et al., 2014; Vasconcelos et al., 2013), country of birth and how long they had been living in the country that the study was completed in (Cotton et al., 2013), or the primary language spoken at home (Cotton et al., 2013; McNab et al., 2007). Two studies reported service users, but not caregivers', ethnicity (Hinrichsen & Lieberman, 1999; Patterson et al., 2005), and one controlled for service users' ethnicity in their analyses (Hinrichsen & Lieberman, 1999). In the Tomlinson et al. (2014) study, 21% of the participants were white, 63% were black, 8% were Asian and 8% were classified as 'other'. In the Vasconcelos et al. (2013) study, 85% were white, 4% black, 4% Asian, 5% were classified as 'mixed' ethnicity and 3% as 'other'.

Expressed Emotion domain measurement

A summary of study measures and outcomes can be seen in Table 2. Most of the papers included in this review looked at criticism or criticism and EOI. Only one paper reported the relationship between a caregiver variable and hostility, warmth and positive remarks (Vasconcelos et al., 2013). Four different measures were used to assess the EE domains. The most commonly used measure was The Family Questionnaire (FQ); a self-report measure of criticism and EOI for caregivers that was originally written in both German and English (Wiedemann et al., 2002). Caregivers are classified as high in criticism if they score 23 or above on the criticism scale, and high in EOI if they score 27 or above on the EOI scale (Wiedemann et al., 2002). The FQ was used in eight papers (Alvarez-Jimenez et al., 2010; Cotton et al., 2013; Gonzalez-Blanch et al., 2010; Jansen, Haahr, et al., 2015; Jansen, Harder, et al., 2015; Jansen et al., 2014; McNab et al., 2007; Zanetti et al.,

2018). A Brazilian-Portuguese (Zanetti et al., 2013) and Spanish version (Gonzalez-Blanch et al., 2010) of the FQ were used in two studies. The three papers which came from the larger Danish study also used the FQ to measure domain EE (Jansen, Haahr, et al., 2015; Jansen, Harder, et al., 2015; Jansen et al., 2014). However, the FQ has not been validated with the Danish population.

Two studies used the expanded version of the PRS and two used the FAS, both of which are self-report questionnaires measuring criticism. The FAS has no specific cut-off to distinguish high and low criticism, but a score of above 50 has been shown to correlate with high CC on the CFI (Kavanagh et al., 1997). One study used a validated Japanese version of the FAS and applied a cut-off score of 60 to detect high criticism (Fujita et al., 2002; Hamaie et al., 2016), and the other used the FAS score as a continuous variable (Tomlinson et al., 2014). On the PRS, lower scores reflect lower levels of criticism towards the patient.

The only EE measure used that was not self-report was the CFI; a semi-structured interview which assesses all five EE domains based on the spontaneous comments that a relative makes about the patient. It is considered to be the gold standard measure of EE due to its predictive validity (Hooley & Parker, 2006). For this reason, later measures of EE have been validated against it. Only two papers utilised the CFI (Patterson et al., 2005; Vasconcelos et al., 2013).

Relationship between caregiver psychological variables and EE domains

The caregiver variables included in the papers can be divided into the following non-mutually exclusive categories: burden/ experience of caregiving, distress, understanding of illness, response to illness, and cognitive processes.

Burden/ Experience of caregiving

Five studies measured caregiver subjective burden using three different measures; The Experience of Caregiving Inventory (ECI) (Szmukler et al., 1996), The Social Behaviour Assessment Scale – Spanish version (Otero, 1990), and the

Table 2*Relationships between Expressed Emotion and caregiver psychological factors*

Author (year)	Measure of EE	Domains assessed ^a	Additional caregiver psychological variables studied and measures used	Key Findings
Alvarez-Jiminez et al. (2010).	Family Questionnaire (FQ; Wiedeman et al 2002).	Criticism EOI	Burden; Total score on the negative subscale on the Experiences of Caregiving Inventory (ECI) (Szmukler et al., 1996) Distress; GHQ-28 (Goldberg, 1972). Stress, somatic symptoms, and depression subscales only	EOI was correlated with burden ($r = 0.56, p < 0.01$), somatic symptoms ($r = .28, p < .05$), stress ($r = .56, p < .01$), and depression ($r = .29, p < .05$). Criticism was correlated with burden ($r = .45, p < .01$) and with stress ($r = 0.34, p < .01$), but not with somatic symptoms or symptoms of depression. The correlation between EOI and stress was significantly greater than the correlation between criticism and stress. There were no significant differences in the strengths of the correlations between EOI and burden and criticism and burden.
Brent et al. (2011)	The Patient Rejection Scale (PRS; Kreisman et al., 1979)	Criticism	Insight into illness; Scale to assess unawareness of mental disorder (SUMD) – modified version for caregivers (Smith et al., 1997). Includes the following subscales: degree of awareness that the individual that they care for has a mental health difficulty, awareness of the effects of medication on the mental health difficulty, awareness of the need for treatment, awareness of the psychosocial consequences of the mental health difficulty, awareness of symptoms, and attribution of symptoms to the mental health difficulty	Correlation between greater caregiver awareness of patient illness and lower levels of caregiver criticism ($r^2 = .65, p = .01$). No other significant correlations found between criticism and other SUMD subscales.
Cotton et al. (2013)	FQ	Criticism EOI	Coping style; Ways of Coping Checklist – 28 item version (MacCarthy & Brown, 1989). Authors extracted five types of coping from this: 1.) Cognitive-escape coping 2.) Optimistic coping, 3.) Seeking connections, 4.) Tension reduction, 5.) Distancing.	Coping style explained 30% of the variance in criticism, and 46% of the variance in EOI after controlling for duration of illness and number of service contacts. For both FQ subscales, cognitive-escape coping was the strongest predictor followed by tension reduction. Distancing was also predictive of criticism and seeking connections was associated with EOI.
Gonzalez Blanch et al. (2010) ^b	FQ	Criticism EOI	Burden; Social Behaviour Assessment Scale (SBAS) (Otero, 1990).	Only EOI correlated with subjective burden ($r = .752; p < .001$).

Author (year)	Measure of EE	Domains assessed ^a	Additional caregiver psychological variables studied and measures used	Key Findings
Hamaie et al. (2016)	Family Attitudes Scale (FAS; Kavanagh et al, 1997).	Criticism	Depression; Beck Depression Inventory (BDI) – Japanese Version (Kojima et al., 2002)	<p>Criticism was correlated with BDI score.</p> <p>When caregiver variables (age, relationship to individual with FEP, education, and BDI score) and variables related to the individual with FEP (age, gender, education, % living with caregivers, occupation, outpatient/ inpatient status, symptoms, global functioning, and social and occupational functioning) were controlled for, caregivers' BDI score independently contribution to FAS scores ($\beta = 0.47$, $B = 0.96$, $p = .001$)</p>
Hinrichsen and Lieberman (1999)	PRS	Criticism	<p>Illness attributions; The Psychiatric Disabilities Attribution Questionnaire (Krauss, 1988). Measures four attributions about the cause of psychiatric illness: 1.) Psychogenic (early familial influences such as distant or rejecting parents, family conflict or trauma) 2.) Moral (personal failings on the part of the individual with FEP) 3.) Organic (psychosis the result of biochemical, genetic, or brain defect) and 4.) Stress (recent events that have psychologically taxed the patient)</p> <p>Coping; indices of coping from the Health and Daily Living Form (Moos et al., 1984). Measures the different coping strategies used by caregivers to deal with problems or feelings they experience in relation to the individuals FEP. Three types of coping; 1.) Active cognitive coping (e.g. efforts to think through the problem and the consequences of actions) 2.) Active behavioural coping (e.g. efforts to change the stressful situation) 3.) Avoidance coping (e.g. efforts to deny the event or to reduce dysphoric affects)</p> <p>Patient Management Strategies; Dementia Management Strategies Scale (Hinrichsen & Niederehe, 1994). Three subscales: 1.) Authoritarianism/ reasoning (behaviours that are critical or directive of the patient) 2.) Stimulation/ support (efforts to engage and encourage the patient) 3.) Conflict avoidance (efforts to contain expressions of upset in relation to the patient or to reduce the likelihood of conflict)</p>	<p>Greater psychogenic attributions about the patient's illness were associated with higher PRS scores ($B=.35$, $p<.05$). Organic, stress, and moral attributions were not associated with PRS scores.</p> <p>Avoidance coping was significantly related to PRS scores ($B=.37$, $p<.001$). Active coping strategies were not related to PRS scores.</p> <p>Conflict avoidance ($B=.37$, $p<.001$) and authoritarianism/ reasoning ($B=.33$, $p<.01$) were associated with higher PRS scores. Stimulation/ support strategies predicted lower PRS scores ($B=-.31$, $p<.05$).</p>

Author (year)	Measure of EE	Domains assessed ^a	Additional caregiver psychological variables studied and measures used	Key Findings
Jansen, Haahr et al (2015)	FQ	Criticism EOI	Distress; General Health Questionnaire – 30 (GHQ-30; (Goldberg, 1972; Goldberg, 1988). Total score and subscales (anxiety, depression, wellbeing, social dysfunction, and coping failures).	<p>High scores on EOI significantly predicted total GHQ-30 score after controlling for caregiver's gender and cohabitation, and the level of symptoms and overall functioning in patients ($B = 1.13$, $CI = 0.48 - 1.78$, $p < .001$). Criticism did not significantly contribute to this model.</p> <p>When compared to caregivers with low EOI, caregivers with high EOI had a significantly higher mean level of total distress and a higher score on all the GHQ-30 subscales.</p> <p>Compared to caregivers with low criticism, caregivers with high criticism had a significantly higher mean level of total distress and a higher score on the anxiety, coping difficulty, and social dysfunction subscales. There was no difference between the high and low criticism groups on the low self-esteem and depression subscales.</p>
Jansen, Harder et al. (2015)	FQ	Criticism EOI	Metacognition; Metacognitions Questionnaire – 30 (MCQ-30; (Wells & Cartwright-Hatton, 2004). Five subscales: positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, lack of cognitive confidence, beliefs about need to control thoughts and cognitive consciousness.	<p>EOI correlated with negative beliefs about worry ($r = .39$, $p < .01$), lack of cognitive confidence ($r = .22$, $p < .5$), and beliefs about the need to control thoughts ($r = .21$, $p < .01$) but not with positive beliefs about worry or cognitive self-consciousness.</p> <p>Criticism was correlated with negative beliefs about worry ($r = .23$, $p < .05$) and beliefs about the need to control thoughts ($r = .23$, $p < .01$), but not with positive beliefs about worry, beliefs about cognitive confidence, or cognitive self-consciousness.</p>
Jansen et al. (2014)	FQ	Criticism EOI	<p>Experiences of caregiving; ECI. Study used both positive and negative subscales.</p> <p>Metacognition; Metacognition Assessment Scale – abbreviated – Danish version (MAS-A) (Lysaker et al., 2005).</p>	<p>Significant associations between EOI and negative experiences of caregiving ($r = .66$, $p < .01$) but not positive experiences of caregiving. The study did not look at the relationship between criticism and experiences of caregiving.</p> <p>No significant association was found between capacity for metacognition and caregiver criticism.</p>

Author (year)	Measure of EE	Domains assessed ^a	Additional caregiver psychological variables studied and measures used	Key Findings
McNab et al. (2007)	FQ	Criticism EOI	<p>Attributions of control; Illness Perception Questionnaire – modified for relatives of patients with schizophrenia (Barrowclough et al., 2001). Measured patient-centred and relative-centred attributions.</p> <p>Beliefs about the utility of EE behaviour; authors developed a brief questionnaire which measured beliefs about the utility of criticism (behaviour focused criticism and person focused criticism) and beliefs about the utility of EOI (self sacrifice and over-intrusiveness).</p> <p>Distress; GHQ 28. Total score only.</p>	<p>High criticism group more likely to report patient-centred control attributions than low criticism group ($t(51)=2.89, p<.01$) but not more likely to report relative-centred control attributions. Patient centred attributions no longer predicted criticism when service user's positive symptoms were controlled for. EOI was not correlated with control attributions.</p> <p>High criticism participants scored higher than low criticism participants on belief in the utility of person- focused criticism ($t(51)=3.64, p<.001$). Criticism was not related to belief in the utility of behaviour focused criticism, self-sacrifice or over-intrusiveness. Belief in the utility of person-focused criticism remained a predictor of criticism when service users' positive symptoms were controlled for.</p> <p>In a logistic regression, with service users' positive symptomatology, patient-centred control attributions, and belief in the utility of person-focused criticism as predictors, only the utility belief (Wald's statistic=5.21, $p<.05$) independently predicted criticism.</p> <p>High EOI participants scored higher than low EOI participants on belief in the utility of self-sacrifice ($t(51)=1.92$, one-tailed $p<.05$), but not in belief in the utility of over-intrusiveness, person-focused criticism, or behaviour focused criticism.</p> <p>GHQ-28 scores were significantly higher in the high EOI group (mean=30.39, S.D.=11.40) than in the low EOI group (mean=23.57, S.D.=10.94; $t(47)=2.22, p<.05$). There were no significant differences in GHQ – 28 scores across the high and low criticism groups.</p> <p>Results reanalyzed with one parent randomly excluded to control for possible inflation of results due to using two parents of the same patient. High criticism was still associated with higher levels of patient-centred control attributions ($t(34)=2.77, p<.01$) and with higher scores on the person-focused criticism utility belief item ($t(34)=3.02, p<.01$). EOI was no longer associated with the self-sacrifice utility belief.</p>
Patterson et al. (2005)	Camberwell Family Interview (CFI; Vaughn & Leff, 1976)	Criticism EOI	<p>Burden (ECI)</p> <p>Texas revised inventory of grief (TRIG; Miller et al., 1990)</p> <p>Calgary Depression scale for Schizophrenia (Addington et al., 1992)</p>	<p>High EOI relatives reported higher burden scores ($M = 84.5, SD = 28$) than low EOI relatives ($M = 66.4, SD = 17.9; p<.01$). There was not a significant difference between high and low criticism relatives on their ECI scores.</p> <p>High EOI relatives reported significantly higher loss scores than low EOI relatives. High criticism relatives scored significantly lower on the TRIG than low criticism relatives. High EOI group appraised greater loss than the high criticism group ($p<.001$).</p> <p>They did not find a relationship between criticism and depression or EOI and depression.</p>

Author (year)	Measure of EE	Domains assessed ^a	Additional caregiver psychological variables studied and measures used	Key Findings
Tomlinson et al. (2014)	FAS	Criticism	<p>Burden; Total score on the negative subscales of the ECI</p> <p>Anxiety and depression; Hospital Anxiety and Depression Scale (HADS; (Zigmond & Snaith, 1983)</p> <p>Theory of Mind; Hinting Task (Corcoran et al., 1995), Facial Expressions of Emotion Stimuli Test (Aw et al., 2002)</p>	<p>FAS score highly correlated to anxiety on the HADS ($r_s = .654, p < .01$) and depression on the HADS ($r_s = 0.576, p < 0.01$) and caregiver burden ($r_s = .843, p < .01$).</p> <p>FAS scores did not correlate with scores on the Hinting Task or the Facial Expressions of Emotion Stimuli test</p>
Vasconcelos et al. (2013)	CFI	Criticism EOI Hostility Warmth Positive Remarks	<p>Controllability attributions; CFI, coding manual adapted from Weisman et al. (1993). Measured extent to which relative's perceived the behaviours/ symptoms of the individual they cared for to be within the individual's control</p> <p>Behavioural control; Measured by the CFI (according to (Hooley & Campbell, 2002). Measured any attempt by the caregiver to guide or control the individual with FEP, or the behaviour of the individual with FEP. Two subtypes of behavioural control: direct influencing and buffering. Direct influencing = any attempt the caregiver makes that aims to change the behaviour of the individual with FEP. Buffering = when the relative tries to proactively take control or do things for the individual with FEP.</p>	<p>Controllability attributions were positively correlated with criticism but not with Hostility, EOI, Warmth, or Positive Remarks.</p> <p>Overall behavioural control score was positively correlated with criticism and with Hostility, but not with EOI, Warmth, or Positive Remarks. Direct influencing proportional score was positively correlated with criticism and Hostility, but not with EOI, Warmth, or Positive Remarks. Buffering proportional score was positively correlated with criticism and EOI, but not with Hostility, Warmth or Positive Remarks.</p> <p>Criticism predicted 'direct influencing' as the type of behavioural control attempt predominantly used by the caregiver ($B = .56, t(75) = 4.15, p = .001$) after controlling for hostility, participant age, gender, relationship to service user, amount of contact with service user, CFI length, and service user symptoms.</p> <p>Hostility predicted 'direct influencing' as a type of behavioural control attempt predominantly used by the caregiver ($B = -.26, t(75) = -2.02, p = .047$) after controlling for criticism, participant age, gender, relationship to service user, amount of contact with service user, CFI length, and service user symptoms.</p> <p>Both criticism ($B = 0.22, t(77) = 2.06, p = .043$), and EOI ($B = 0.29, t(77) = 2.74, p = .008$), significantly and independently predicted 'buffering' as the type of behaviour control attempt predominantly used by the caregiver after controlling for participant age, relationship to service user, amount of contact with service user, CFI length, and service user symptoms, explaining 14% of the variance in buffering ($r^2 = 0.14, F(2, 77) = 6.26, p = .003$).</p>

Author (year)	Measure of EE	Domains assessed ^a	Additional caregiver psychological variables studied and measures used	Key Findings
Zanetti et al. (2018)	Family Questionnaire – Brazilian Portuguese Version (FQ-BPV; Zanetti et al., 2012).	Criticism EOI	Burden; Burden Interview Scale, Brazilian Version (Sczufca, 2002).	Strong, positive and significant correlations between criticism and burden ($r = .660, p < .001$) and between EOI and burden ($r = 0.645, p < .001$).

Note. EOI = Emotional Over-Involvement, EE = Expressed Emotion, CI = confidence interval

^a = Reports domains included in the analysis of relationships between EE and additional caregiver psychological variables.

^b = Baseline study data reported only

Burden Interview Scale, Brazilian version (Scazufca, 2002). Of these, four looked at burden and EOI and found either a significant positive correlation between these two variables (Alvarez-Jimenez et al., 2010; Gonzalez-Blanch et al., 2010; Zanetti et al., 2018) or found that the high EOI group had significantly higher burden scores than the low EOI group (Patterson et al., 2005). One paper used the ECI as a measure of attitudes towards caregiving, and found that EOI was significantly and positively associated with negative, but not positive, experiences of caregiving (Jansen et al., 2014).

Five papers explored the relationship between criticism and burden. Of these, three studies conducted in Brazil, the UK and Australia found a significant positive correlation between criticism and burden (Alvarez-Jimenez et al., 2010; Tomlinson et al., 2014; Zanetti et al., 2018), and two studies not did find such a relationship (Gonzalez-Blanch et al., 2010; Patterson et al., 2005). When the correlations between EOI and burden and criticism and burden were compared no significant differences in the strengths of the correlations were found (Alvarez-Jimenez et al., 2010). There were no clear differences between the studies that found a relationship between criticism and burden and those that did not.

Distress

Six studies looked at caregiver distress using different measures. Two used an overall measure of distress (Jansen, Haahr, et al., 2015; McNab et al., 2007). McNab et al. (2007) compared caregivers who were rated as 'high' or 'low' in EE and found that caregivers in the high EOI group were significantly more distressed than those in the low EOI group, but they did not find a significant difference in levels of distress between the high and low criticism group. Similarly, Jansen, Haahr, et al. (2015) found that after controlling for gender, cohabitation, and the patients symptoms and overall functioning, criticism did not significantly correlate with overall caregiver distress, but EOI still did.

Of the five studies that measured symptoms of depression, two found a positive relationship between criticism and depression (Hamaie et al., 2016; Tomlinson et al., 2014), but three did not (Alvarez-Jimenez et al., 2010; Jansen, Haahr, et al., 2015; Patterson et al., 2005). The findings of studies looking at the relationship between EOI and depression were also variable. Two studies found that high EOI caregivers were more likely than low EOI caregivers to be experiencing symptoms of depression (Alvarez-Jimenez et al., 2010; Jansen, Haahr, et al., 2015). However, Patterson et al. (2005) did not find a relationship between EOI and depression. These studies employed different depression measures, making it difficult to compare between them, and there were no clear differences between the studies that found a relationship between EE domains and depression and those that did not.

Two studies looked at criticism and anxiety; both found that criticism positively correlated with anxiety (Jansen, Haahr, et al., 2015; Tomlinson et al., 2014). High EOI was also found to be related to higher anxiety in the one study that looked at this relationship (Jansen, Haahr, et al., 2015). Patterson et al. (2005) measured the extent to which caregivers were 'grieving' for the loss of hopes and aspirations that they had had for their loved one. They found that high EOI relatives had a high appraisal of loss, whereas high criticism relatives had a low appraisal of loss. Alvarez-Jimenez et al. (2010) looked at EE and stress and found that whilst both criticism and EOI correlated positively with stress, the EOI-stress relationship was stronger, and Jansen, Haahr, et al. (2015) found that both high criticism and high EOI groups experienced more coping difficulties than their low EOI and low criticism counterparts. Lastly, both high EOI and high criticism caregivers experienced more social difficulties than low EOI or low criticism groups, but only the high EOI caregivers experienced significantly more low self-esteem than low EOI caregivers; the high and low criticism groups did not differ in terms of their self-esteem (Jansen, Haahr, et al., 2015).

Understanding of illness

Five studies used measures that tapped into caregivers understanding of psychosis, including insight into the illness (Brent et al., 2011), illness attributions (Hinrichsen & Lieberman, 1999; McNab et al., 2007; Vasconcelos et al., 2013) and beliefs about the utility of EE behaviour (McNab et al., 2007). This was the only category that included a study that featured warmth and positive remarks in the analyses (Vasconcelos et al., 2013).

Criticism was found to negatively correlate with caregivers' awareness of the illness, but not with awareness of the effects of treatment, need for treatment, or the psychosocial consequences of psychosis (Brent et al., 2011). Three studies investigated illness attributions and EE. One found that the extent to which caregivers perceived their relatives' symptoms and behaviours to be within their relatives' control (known as 'controllability attributions') was positively correlated with criticism, but not with any of the other EE domains (Vasconcelos et al., 2013). However, McNab et al. (2007) did not find this relationship after controlling for the positive symptoms of psychosis. McNab et al. (2007) also found that relatives beliefs about being able to control their loved ones symptoms were not associated with criticism or EOI (McNab et al., 2007). The third study (Hinrichsen & Lieberman, 1999) found that after controlling for relationship type, service user ethnicity and age, amount of contact, and whether or not the caregiver and service user lived together, belief that familial factors such as parenting, family conflict and childhood trauma caused the psychosis predicted higher criticism score. This finding is interesting given that just over 90% of the sample were biological relatives of the patient.

McNab et al. (2007) looked at caregivers beliefs about the utility of typically critical and EOI behaviours and again controlled for psychosis symptoms. They found that more critical caregivers were more likely to believe that criticising their

relative *as a person* would control their relatives symptoms, but the relationships between higher EOI and beliefs in the utility of EOI behaviours were non-significant.

Response to illness

Two studies measured the way that caregivers responded to their unwell relative (Hinrichsen & Lieberman, 1999; Vasconcelos et al., 2013). One paper used the CFI to assess the extent to which relatives were trying to guide or control the service users behaviour either through 'direct influencing' (e.g. giving advice) or 'buffering' (e.g. supervising their relative whilst they complete a task) (Vasconcelos et al., 2013). They found that the use of 'buffering' was predicted by both EOI and criticism scores after controlling for participant age, gender, relationship to service user, amount of contact with service user, CFI length, and service user symptoms, but the strength of the association between EOI and 'buffering' was stronger than it was for criticism and 'buffering'. Meanwhile 'direct influencing' was predicted by criticism and hostility after controlling for similar variables. They did not find a relationship between warmth and positive remarks and behavioural control scores (Vasconcelos et al., 2013).

Similarly, Hinrichsen and Lieberman (1999) found that participants who were more likely to respond to their relatives in an authoritarian style or avoid conflict with them were more likely to score higher on criticism, whereas participants who were more likely to try and encourage their relative tended to be less critical. These associations were found after controlling for relationship type, service user ethnicity and age, amount of contact, and whether or not the caregiver and service user lived together.

Of the two papers that assessed caregivers coping style, both found that avoidant coping was positively correlated with criticism after controlling for potentially confounding variables (Cotton et al., 2013; Hinrichsen & Lieberman, 1999). Two particular styles of avoidant coping, referred to as 'cognitive escape

coping' and 'tension reduction', also predicted EOI (Cotton et al., 2013). 'Cognitive escape coping' is characterised by wishful thinking, cognitive avoidance and hopelessness, and 'tension reduction' is characterised by minimising distress through activities such as substance use, or avoiding people to circumvent stigma (Cotton et al., 2013). EOI was also correlated with seeking connections with professionals, friends, or relatives (Cotton et al., 2013).

Metacognition

Three studies looked at the relationships between domain level EE and metacognitive processes (Jansen, Harder, et al., 2015; Jansen et al., 2014; Tomlinson et al., 2014). Criticism was positively correlated with negative beliefs about worry and the need to control one's thoughts (Jansen, Harder, et al., 2015), but not with metacognitive ability, including social cognition (Jansen et al., 2014; Tomlinson et al., 2014) or with positive beliefs about worry, cognitive confidence (e.g. confidence in one's memory), or cognitive consciousness (e.g. extent someone observes their thoughts) (Jansen, Harder, et al., 2015). Similarly to criticism, EOI was found to positively correlate with negative beliefs about worry and beliefs about the need to control one's thoughts, but not with positive beliefs about worry or cognitive consciousness (Jansen, Harder, et al., 2015). However, unlike criticism, EOI was associated with having lower cognitive confidence (Jansen, Harder, et al., 2015).

Discussion

Findings

This was the first review to summarise and evaluate research investigating the relationship between domain level EE (criticism, hostility, EOI, warmth, and positive remarks) and psychological variables in caregivers of individuals with FEP. Twelve studies, generating 14 research papers, were included. Overall, the papers

faired well on the quality assessment tool. However, none of the papers provided sufficient data to assess the appropriateness of the sample size, making it difficult to assess the statistical robustness of the findings. Furthermore, there was a tendency for papers to only partially control for potentially confounding variables such as demographics or service user symptoms, and most did not report information in relation to the cultural background of the participants such as nationality or ethnicity. The latter finding rendered it impossible to conduct any meaningful analysis of cultural variation in the relationships between EE and caregiver psychological variables.

The majority of the papers reviewed reported data on criticism and/ or EOI using self-report measures. Only one study looked at the relationship between the positive aspects of EE (warmth and positive remarks) or hostility and caregiver variables (Vasconcelos et al., 2013). This might be due to the lack of self-report EE measures that assess warmth and positive remarks, and because the CFI, which is the only measure that assesses all five domains, is lengthy and requires training to administer. The caregiver psychological variables featured in the studies were grouped into the following non-mutually exclusive categories: burden/ experience of caregiving, distress, understanding of illness, response to illness, and cognitive processes.

Expressed Emotion and burden/ experience of caregiving

The most consistent and frequent finding in this review was of a positive correlation between EOI and burden (Alvarez-Jimenez et al., 2010; Gonzalez-Blanch et al., 2010; Patterson et al., 2005; Zanetti et al., 2018). Meanwhile, evidence of a relationship between criticism and burden was inconsistent. This is similar to findings from research with caregivers of individuals with chronic psychosis, where studies have tended to find a relationship between EOI and burden (Gupta & Mohanty, 2016; King et al., 2003; Sadiq & Suhail, 2013), whereas

some studies have found a relationship between criticism and burden (Gupta & Mohanty, 2016; King et al., 2003; Villalobos et al., 2017) and others have not (Sadiq & Suhail, 2013). These findings might be explained by the fact that caregivers who are higher in EOI are more likely than more critical caregivers to take over some of their relatives responsibilities, due to a belief that their relative is no longer as capable of doing things for themselves (Kuipers et al., 2010), which may then lead to feelings of burden. Whereas it may be that the relationship between criticism and burden is moderated by additional life stressors that have not been controlled for in these studies, such as socio-economic factors.

Expressed Emotion and distress

Distress was the most commonly researched caregiver variable, although different measures of distress were used across studies, making it difficult to draw robust conclusions from the findings. The studies reviewed showed evidence that caregivers who are higher in EOI or criticism experience more anxiety (Jansen, Haahr, et al., 2015; Tomlinson et al., 2014), stress (Alvarez-Jimenez et al., 2010), and coping and social difficulties (Jansen, Haahr, et al., 2015) than their low EE counterparts. There was also a slight trend in findings indicating that caregivers who are higher in EOI may experience more distress than caregivers who are higher in criticism (Alvarez-Jimenez et al., 2010; Jansen, Haahr, et al., 2015; McNab et al., 2007).

These findings are slightly at odds with those from an earlier review of factors relating to distress amongst FEP caregivers by Jansen, Gleeson, et al. (2015), who concluded that there is an association between EOI and distress but not criticism and distress. The fact the present review found evidence that both EOI and criticism were associated with distress might be explained by the fact that the reviews had different focuses. The current findings also differ to those from the chronic psychosis literature, where there is again evidence that higher EOI, but not

criticism is associated with greater distress (Boye et al., 1998; Karanci & İnandılar, 2002). Furthermore, the review found some evidence that high EOI, but not high criticism, is related to lower self-esteem (Jansen, Haahr, et al., 2015), which is in contrast to Kuipers et al. (2006) finding that lower self-esteem is associated with criticism amongst caregivers of service users with chronic psychosis.

It is not surprising that caregivers would experience distress in the early stages of their loved one experiencing psychosis as they try to come to terms with the illness. It may be that caregivers who are lower in criticism or EOI experience less distress than their high EE counterparts as they have more effective coping strategies. This hypothesis is supported by the finding in this review that both high EOI and critical caregivers are more likely to use avoidant coping strategies (Cotton et al., 2013; Hinrichsen & Lieberman, 1999). However, it may be that similarly to the hypothesised relationship between EOI and burden discussed above, the behaviours associated with EOI, such as overprotectiveness and excessive self-sacrifice (Singh et al., 2013) lead to additional feelings of stress and exhaustion, as well as less time for-self care in higher EOI caregivers (Kuipers et al., 2010), which may exacerbate their distress. Furthermore, caregivers who are higher in EOI might be more likely to experience low self-esteem from the outset of caring for someone with psychosis, perhaps related to giving up valued roles to focus on caregiving (Kuipers et al., 2010). The feelings of distress may continue, but it may be that there is a reduction in low self-esteem over time as a result of deriving some self-worth from doing things for their loved one (Chen & Greenberg, 2004).

On the other hand for more critical caregivers, once the initial shock of their loved ones illness has been processed, if the psychosis becomes chronic they may experience less of the distress that may be associated with high EOI behaviours. However, these caregivers might be more likely to experience low self-esteem later in the course of the illness, as they may feel less efficacious in supporting their loved one. Possible support for this hypothesis comes from another study in this

review that found that critical caregivers tend to believe that criticism can help control their relatives' symptoms (McNab et al., 2007). Thus, it may be that as these caregivers learn that this is not the case, negative feelings about themselves start to emerge.

The evidence for a relationship between criticism or EOI and depression was inconsistent. Two out of three studies found evidence of a positive correlation between EOI and depression (Alvarez-Jimenez et al., 2010; Jansen, Haahr, et al., 2015), compared with two out of five studies for criticism and depression (Hamaie et al., 2016; Tomlinson et al., 2014). The variability in findings might suggest that the relationship between EE and depression is mediated by other variables not necessarily related to the caregiving role, such as the caregivers mental health history.

Interestingly, Patterson et al. (2005) found that high EOI caregivers experienced significantly more feelings of loss compared to low EOI caregivers, whilst caregivers high in criticism experienced less feelings of loss than caregivers who were low in criticism. One hypothesis for this finding is that caregivers who are less critical may be more empathic and therefore experience the loss of the direction that their relatives life may have taken to a greater degree, whereas more critical caregivers may be less empathic and so feel less sense of loss. This theory is supported by research indicating that caregivers of individuals with dementia who are more critical are less likely to respond empathically to their relatives (Garrison-Diehn, 2014).

Overall, the data indicates that certain types of distress, such as anxiety, stress, and coping and social difficulties, are experienced by both FEP caregivers who are high in EOI and those who are high in criticism. However, FEP caregivers who are higher in EOI may experience greater distress than caregivers who are more critical, including lower self-esteem and a greater sense of loss.

Expressed Emotion and understanding of illness

Research with caregivers of individuals with chronic psychosis has found that critical caregivers are more likely to believe that their relatives can control their symptoms (Brewin et al., 1991). This finding was significant even after controlling for the service users' symptoms. Meanwhile caregivers who are higher in EOI are more likely to believe that the symptoms are outside of their relative's control (Barrowclough et al., 1994). However, the findings from two studies in the present review that looked at criticism and controllability attributions were equivocal, with one study finding that the relationship was no longer significant after controlling for the service users positive symptoms (McNab et al., 2007).

The discrepancy in findings between the Brewin et al. (1991) and McNab et al. (2007) studies may be related to how control attributions were measured, with the former assessing spontaneous attributions made by relatives during an interview, and the latter using a questionnaire. An interview approach might result in more caregivers being rated as making attributions of control towards their relatives, as they may share views that are not captured by a questionnaire. Taken alongside Brent et al. (2011) finding that more critical caregivers have less insight into their relatives illness than less critical caregivers, the data supports the notion that critical caregivers are likely to benefit from psycho-education about psychosis and it's symptoms (Kuipers et al., 2010).

In terms of caregivers' beliefs about their role in their relative's illness, one study found that after controlling for relatives' psychosis symptoms, critical caregivers were more likely to believe that criticism would help control their relative's symptoms, whilst no relationship between EOI and beliefs in the utility of EOI behaviour were found (McNab et al., 2007). The findings suggest that the behaviour of critical caregivers is motivated by a belief that criticism will help their loved one, whereas over-intrusiveness and self-sacrificing behaviours from caregivers higher in EOI are not necessarily motivated by a belief that such behaviours will help their

relatives symptoms. These findings indicate the importance of taking a curious and empathic stance to understanding the intentions behind caregivers' responses.

Interestingly, Hinrichsen and Lieberman (1999) found that after controlling for relationship type, service user ethnicity and age, amount of contact, and whether or not the caregiver and service user lived together, there was a positive association between criticism and the belief that family factors caused the psychosis. In research with caregivers of individuals with chronic psychosis, EOI, but not criticism has been found to be associated with self-blame (Peterson & Docherty, 2004). Although this requires further exploration, clinicians should bear in mind that at least in the early stages of the illness, more critical caregivers may hold feelings of blame or guilt about the illness, highlighting the importance of asking all caregivers about their beliefs about what caused the psychosis.

Expressed Emotion and response to illness

There was some evidence that caregivers who were higher in criticism and hostility tended to try to change service users' behaviour, whereas caregivers who were higher in EOI were more likely to try and do things on behalf of the service user (Vasconcelos et al., 2013). These findings are consistent with Kuipers et al. (2010) caregiving model by demonstrating possible differences in appraisal between higher EOI and more critical relatives, with more critical relatives being more likely to appraise the service user as having agency over their behaviour and therefore directing them to try and change, whilst higher EOI relatives may be more likely to believe that the service user does not have any control over their behaviour and that they therefore need to do things on the service users behalf (Vasconcelos et al., 2013). However, Vasconcelos et al. (2013) found that more critical caregivers also tried to do things for the service user, though to a lesser extent than EOI caregivers. This suggests that services should explore with all caregivers how much they try to

direct or do things for the service user, and whether or not the service user experiences this as helpful.

Furthermore, the review found evidence that caregivers that were more likely to express criticism were more authoritarian and avoidant of conflict with their relative (Hinrichsen & Lieberman, 1999). This supports the use of interventions that include problem-solving strategies to develop more helpful methods of communication between FEP caregivers who present as critical and the individuals who they care for. This review found that both high EOI and critical caregivers employed avoidant coping strategies (Cotton et al., 2013; Hinrichsen & Lieberman, 1999), whereas research with caregivers of individuals with chronic psychosis has suggested that only criticism is linked with an avoidant coping style (Kuipers et al., 2006). However, the present review also found a positive correlation between high EOI, but not criticism, and seeking emotional and practical support from services, friends, or relatives (Cotton et al., 2013). Thus it may be that for higher EOI caregivers, this serves a protective function against longer term coping difficulties. This may also support Kuipers et al. (2010) suggestion that more critical caregivers may be less likely to engage with interventions, suggesting that services may need to be more proactive in reaching this group. Overall, the findings suggest that interventions that help caregivers to tolerate distress, thereby reducing the need to utilise avoidant coping strategies, might be helpful.

Expressed Emotion and cognitive processes

There was some initial evidence that both caregivers who are higher in EOI and higher in criticism are more likely to have negative beliefs about worry and believe that they need to control their thoughts (Jansen, Harder, et al., 2015). Such beliefs have shown to be implicated in anxiety (Spada et al., 2010), which fits with the finding from the present review that caregivers rated as high in EOI or criticism experience more anxiety than their low EE counterparts (Jansen, Haahr, et al.,

2015). This suggests that caregivers may benefit from interventions that help them to focus attention away from their thoughts.

Cultural variation in findings

Only one third of studies reported demographic information related to the participant's cultural background. Consequently, it was not possible to address the second aim of the review: to examine whether or not there were cultural differences in the relationship between EE domains and caregiver psychological factors. The term 'culture' in this review was used broadly to include contexts such as ethnicity and migration, which are rather crude proxies for cultural group membership (Rosenfarb et al., 2006). In reality, culture is made up of many different elements, including the intersection of ethnicity, nationality, religion, gender, sexuality, geographic location and socio-economic status. None the less, the lack of reporting of cultural demographic variables is surprising given the body of research indicating that culture impacts on how we appraise and cope with stress in the caregiving role (Chakrabarti, 2013), and the cultural variability reported in the relationship between EE domains (particularly EOI) and clinical outcomes (Lopez et al., 2004; Singh et al., 2013). Furthermore, EE is a cultural construct (Jenkins & Karno, 1992); what is labelled as problematic emotional expression and behaviour will be dependent upon cultural norms (O'Driscoll et al., 2019; Onwumere et al., 2009; Smith et al., 2020).

The majority of the studies included in this review used measures of EE that had been validated for use within the country the study was conducted, but the measures may have been interpreted differently, and the responses elicited might have carried different meanings, depending on the cultural background of the participants. Furthermore, EE may have different psychological correlates across cultures. An awareness of how EE may affect caregivers differently depending on their cultural background can help clinicians to gain a more sensitive understanding of the caregiver's experience. For example, it may be that EOI is associated with

burden in some cultures but not in others, so interventions aimed at reducing burden may not be appropriate for everyone. However, Tomlinson et al. (2014) found a relationship between criticism and burden and criticism and mood in a predominantly black sample. Additionally, Hinrichsen and Lieberman (1999) found significant associations between criticism and caregiver psychological factors after controlling for service users' ethnicity. Although further research is needed in this area, these findings might suggest that there are similarities in caregiver correlates of EE between seemingly different cultural groups living in the same country.

Sample characteristics

The studies varied in their eligibility criteria, with some specifying that the caregiver had to be a relative of, or living with the individual, or stipulating a minimum amount of contact time between the caregiver and individual with FEP. Meanwhile other studies were less prescriptive. Consequently, different studies may have been tapping into different types of caregiving relationship, although the majority of caregivers in this review tended to be living with the individual with FEP. Given that early work into the relationship between expressed emotion and relapse found that individuals with psychosis who spent more than 35 hours per week with their caregivers were more likely to relapse than their counterparts who spent less time with their caregivers (Brown et al., 1972), it seems likely that contact time might moderate the relationship between EE domains and caregiver psychological factors. However, three studies still had significant findings after controlling for this variable (Hinrichsen & Lieberman, 1999; McNab et al., 2007; Vasconcelos et al., 2013).

Most of the participants across studies were female and relatives of the patients (particularly mothers), so it may be that EE has different psychological correlates in men or in non-maternal caregiving relationships. Fewer than half of the studies considered how caregiver demographic variables might influence the relationship between EE and caregiver psychological processes (Brent et al., 2011;

Hamaie et al., 2016; Hinrichsen & Lieberman, 1999; Jansen, Haahr, et al., 2015; McNab et al., 2007; Vasconcelos et al., 2013). Again, this is surprising, as previous research with caregivers of individuals with more long standing psychosis has found that higher EOI is related to being female, not working, living in a rural area (Koutra, Triliva, Roumeliotaki, Lionis, et al., 2015), being the service users mother and being single (Bentsen et al., 1996). Meanwhile more critical caregivers are more likely to be single parents and live in cities (Koutra, Triliva, Roumeliotaki, Lionis, et al., 2015). Furthermore, there is some evidence that illness attributions may be related to education level (Macgregor et al., 2017). It is possible therefore that some of the findings in the studies included in this review would have been rendered non-significant after controlling for demographic variables.

In studies where it was reported, rates of unemployment were high, ranging from 8% to 32% (Gonzalez-Blanch et al., 2010; Tomlinson et al., 2014; Vasconcelos et al., 2013). It is unclear whether the unemployment rates are directly related to participants taking on the caregiving role, but unemployment may pose an additional strain on the family that services must consider when supporting caregivers. For example, Wan and Wong (2019) found that resigning from work or moving to part-time employment as a result of caring for an individual with psychosis has a negative impact on caregivers social life and general quality of life.

Strengths and limitations of review

A strength of this review is that focusing on EE domains rather than high/ low EE allowed for greater specificity in understanding relationships between EE and caregiver psychological factors. However, it did not explore how service user factors might affect the relationship between EE domains and caregiver psychological variables. EE exists within a dyadic relationship between a caregiver and the individual that they care for. Consequently, factors such as the service users' symptoms and level of functioning are likely to impact on, and interact with, how the

caregiver perceives and experiences the symptoms, and vice versa. Very few studies included in this review controlled for these variables in their analyses. Some of the inconsistencies in findings may well be explained, at least partly, by factors related to the individual being cared for. Furthermore, this review did not include other caregiver factors that are likely to impact on the caregiving relationship, such as physical health and objective measures of burden, including financial impact and amount of time spent caregiving. Nor did it consider contextual stressors that caregivers may be facing, such as poverty or other experiences of adversity. Furthermore, service users' perceptions of EE may be a better predictor of psychosis symptoms than caregiver self-reported EE (Bastug and Karanci (2015). Therefore perceived EE may also play an important role in the interaction between caregiver EE and caregiver psychological processes.

Another important limitation is the fact that the data collected was cross-sectional and therefore we cannot draw conclusions about the direction of the relationships. Studies have shown that not all EOI and criticism ratings are stable over time (Patterson et al., 2005; Scazufca & Kuipers, 1998), which may fit with the finding in the present review that the correlates of EE in FEP caregivers sometimes differ from the correlates of EE found in studies with chronic psychosis caregivers. This is likely to be due to complex interactions between caregiver, service-user and contextual variables. Furthermore, this review considered EOI and EE-criticism as two separate constructs, but in reality some caregivers meet criteria for both high EOI and high criticism.

Another strength of this review is that it was conducted systematically. However, an independent researcher was not involved in the literature searching and screening process, which may reduce the reliability of the present findings. This review intended to explore the psychological processes involved in EE in the early stages of the caregiving role. However, it is limited by the fact that it did not include research with chronic psychosis caregivers in the literature search. Doing so would

have allowed for a systematic comparison of the current state of knowledge of the psychological correlates of EE in caregivers of individuals with FEP and chronic psychosis. However, this review highlights the importance of considering the different needs of caregivers who are relatively new to the caregiving role compared with those who have been providing care to their loved ones for many years.

Additionally, the method of scanning the literature to find search terms for caregiver psychological processes may have introduced bias, as it might be that studies that did not yield significant findings were not published. However, the fact that both significant and non-significant findings were reported suggests that this issue might not have been so prominent. As grey literature and unpublished work such as theses were not included, some reports about EE domains and caregiver psychological factors may have been missed. Furthermore, five studies were excluded as they were not available in English, which may have impacted on the results, particularly as such studies may have provided information about relationships between EE and caregiver psychological factors cross-culturally.

The categories of caregiver psychological processes used in this review were somewhat arbitrary. For example, burden was kept separate from the distress category as it was felt that burden is in relation to the caregiving role, whereas depression and anxiety, for example, may not necessarily be a consequence of caregiving. However, the construct of burden clearly overlaps with distress. Furthermore, it is also difficult to delineate burden from appraisal, although appraisal can be considered a broader construct than burden. Indeed one study used the ECI, which intends to measure caregivers appraisal (Szmukler et al., 1996), as a measure of burden. This demonstrates how there is much overlap between different constructs and measures used in the caregiver literature. This runs the risk of researchers talking about the same constructs using different terms, or vice versa. Similarly in this review, the inclusion of multiple constructs relating to caregiving meant that it was difficult to draw meaningful conclusions from the data.

A final strength of the review is that a quality appraisal tool was used and rated by two researchers. However, the findings of this review should be interpreted with caution given that it was difficult to assess the statistical robustness of the studies included.

Research implications

The findings indicate that EE-Criticism and EOI have mutual as well as distinct psychological correlates in caregivers. Therefore, research that focuses on global EE is likely to miss out on identifying more nuanced relationships between EE domains and their correlates. Future research should focus on replicating existing findings and use measures and constructs consistently, in order to improve the reliability and validity of the data and allow for better comparison across studies. Furthermore, researchers should be reporting data relating to the cultural background of participants, allowing for a greater consideration of how culture might be impacting on caregiver processes.

The review identified a gap in the literature in terms of studies rarely investigating the psychological correlates of warmth and positive remarks. As warmth may protect against relapse in individuals with FEP (Lee et al., 2014), an understanding of the psychological processes associated with these EE domains may provide important insights into the mechanisms involved in these types of caregiving response. The review also identified a potential variable of interest – caregiver's beliefs in the utility of high EE behaviour (McNab et al., 2007), that has not yet been studied with caregivers of individuals with chronic psychosis. Such research could help us understand more about the possible intended functions of high EE at the different stages of psychosis. It is interesting to note that the review found evidence that higher EOI is associated with greater caregiver distress than higher criticism is, yet EOI does not appear to relate to relapse in individuals with FEP (Koutra, Triliva, Roumeliotaki, Basta, et al., 2015), suggesting that it may not

be experienced as distressing by service users' during the early stages of the illness. Further research might help identify whether particular aspects of EOI are associated with caregiver distress and which aspects may be perceived as helpful to FEP service users.

Clinical implications

The present review found that similarly to findings from the chronic psychosis literature, the relationship between EOI and burden appears to be stronger than the relationship between EE-criticism and burden. However, in contrast to the chronic psychosis literature, the review found evidence that both criticism and EOI were associated with distress amongst FEP caregivers, although more critical caregivers may experience less distress than their counterparts who are higher in EOI. Furthermore, the review found evidence that more critical caregivers may attribute the cause of the psychosis to familial factors, and caregivers higher in EOI may experience lower self-esteem. This is in contrast to the chronic psychosis literature which has found that EOI, but not criticism, is associated with caregivers blaming themselves for their loved one's illness (Peterson & Docherty, 2004), and that criticism, but not EOI, is associated with low self-esteem (Kuipers et al., 2006). These findings indicate that FEP caregivers who are higher in EOI or in criticism may have different needs to more chronic psychosis caregivers who are higher in these domains, which has implications for interventions.

This review has highlighted how the relationship between EE and FEP caregiver psychological factors can be understood through the Kuipers et al. (2010) cognitive model of caregiving. Caregiver's illness beliefs and pre-existing relationship with the service user impacts how they appraise the service users behaviour, which in turn influences their subsequent thoughts and feelings about themselves and about their loved one, and their behavioural response (Kuipers et

al., 2010). However, this review suggests that Kuipers' and colleague's model may benefit from the inclusion of caregiver psychological traits that may also interact with these processes, such as their metacognitive beliefs. These findings can inform caregiver interventions and NICE guidelines. For example, caregivers who present as higher in EOI may particularly benefit from carers wellbeing interventions that have a heavy focus on managing distress, whilst caregivers presenting as more critical may benefit from an exploration of the intended and unintended consequences of criticism.

Although it was not possible to explore the impact of culture in this review, findings from research with caregivers of individuals with more chronic psychosis indicate that culture is likely to play an important role in the caregiving model in terms of beliefs about illness and caregiving. Clinicians should ensure that they are asking caregivers about how psychosis and caregiving are perceived within their culture (Edge et al., 2018; Lemetyinen et al., 2018; Onwumere et al., 2009; Smith et al., 2020).

Future directions

This review adds to the body of research calling for increased focus on the positive aspects of EE (Butler et al., 2019). More research is needed to elucidate how warmth and positive remarks might relate to caregiver wellbeing and moderate the relationship between the potentially more negative EE domains (criticism, hostility and EOI) and caregiver factors. This may necessitate the creation of validated self-report measures that tap into these positive EE domains. Furthermore, research would benefit from more studies that use both caregiver and service user measures of EE (Bastug & Karanci, 2015; Goddard et al., 2019; Lex et al., 2019). For example, if high EOI is not experienced as intrusive by the service user this may reduce the amount of distress experienced by higher EOI caregivers.

More longitudinal studies would be helpful in understanding the trajectory of EE domains and how individual caregiver psychological processes might influence the course, intensity, and impact of EE domains (Alvarez-Jimenez et al., 2010; Hinojosa-Marqués et al., 2020; Patterson et al., 2005). Furthermore, more research is needed to increase our understanding of how culture might play a role in the relationship between EE and caregiver psychological factors.

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Part 2: Empirical Paper

The relationship between personality characteristics and Expressed Emotion
in significant relationships

Abstract

Aims: Previous research has shown that high Expressed Emotion (EE) may be associated with certain personality characteristics of caregivers. However, less is known about what personality characteristics are associated with EE in non-clinical populations. This knowledge can help us to understand more about whether particular personality factors may predispose some individuals to be more likely than others to express high EE when caring for an unwell relative.

Method: Two-hundred-and-fifty participants were recruited to an online study. Participants were asked to complete a measure of EE in regards to their relationship with a significant other, as well as completing measures of self-criticism and ability to self-reassure (The Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale; FSCRS); interpersonal difficulties (Inventory of Interpersonal Problems-32) locus of control, and personality (The Big Five Personality Inventory-2-Short form).

Results: After controlling for the presence of physical and mental health difficulties in the participant and their significant other, it was found that being more critical of the significant other was associated with greater self-criticism, having more interpersonal difficulties and being less open. Being more emotionally over-involved (EOI) was also associated with being more self-critical and having more interpersonal difficulties, as well as having a more external locus of control. Ability to reassure oneself was negatively associated with both EE-Criticism and EOI.

Conclusions: The findings offer preliminary evidence for psychological characteristics that are associated with EE when physical and mental health difficulties are controlled for. This knowledge can be used to identify caregivers who may benefit from additional, targeted therapeutic interventions. Longitudinal studies that control for life stressors are needed to investigate whether the personality characteristics highlighted in this study play a role in the development of high EE.

Introduction

Background to Expressed Emotion

Expressed Emotion (EE) is a psychological construct used to describe the level of warmth, positive comments, criticism, hostility and emotional over-involvement (EOI) shown by a caregiver towards the individual that they care for. High EE; when a caregiver expresses criticism, hostility, and EOI, has been associated with negative patient outcomes across many different mental health difficulties including psychosis (Weintraub et al., 2017) bipolar disorder, depression, Post Traumatic Stress Disorder (PTSD), Obsessive Compulsive Disorder (OCD), agoraphobia, substance use disorders (Hooley, 2007) and eating disorders (Duclos et al., 2012). EE has also been found to affect how individuals adjust to and manage their physical health conditions (Blanco et al., 2017; Lister et al., 2016; Wearden et al., 2000).

Evidence suggests that interventions for carers and families that target EE reduce rates of relapse and improve outcomes for individuals experiencing a range of difficulties such as psychosis, OCD, and chronic pain (Ballús-Creus et al., 2016; Baruah et al., 2018; Claxton et al., 2017). It is therefore evident that high EE is an important risk factor for worse physical and mental health outcomes. Furthermore, higher EE has been correlated with poorer caregiver mental health and feelings of burden (Hamaie et al., 2016; Jansen et al., 2015; Safavi et al., 2018; Zanetti et al., 2018), and across a range of mental health difficulties, more critical caregivers tend to believe that their relatives can control their symptoms (Barrowclough & Hooley, 2003). However, far less is known about caregiver personality factors that may contribute to the presence of high EE.

The relationship between EE and clinical outcomes appears to differ depending on the type of relationship between the caregiver and relative. In older adults with depression, EE ratings from adult children, but not spouses, predict

clinical outcomes (Hinrichsen & Pollack, 1997), and spouses may have lower EE than other relatives (Heikkilä et al., 2002). The relationship between EE and outcomes also varies across cultures (Hashemi & Cochrane, 1999; O'Driscoll et al., 2019; Singh et al., 2013). For example, in some cultures higher EOI does not predict relapse in individuals with psychosis (Singh et al., 2013). Meanwhile, systematic reviews have found that criticism, but not overall EE, predicts relapse in individuals with First Episode Psychosis (FEP) (Alvarez-Jimenez et al., 2012; Koutra et al., 2015). Such findings suggest that EE domains may be perceived differently depending on their context. Consequently, there has been a growing emphasis on looking at domain EE as opposed to total EE. Researchers tend to focus on the EOI and criticism domains due to the conceptual overlap between criticism and hostility (Hooley, 1998).

Expressed Emotion and service user illness factors

Higher caregiver EE is associated with greater symptom severity and a lower level of functioning in service users (Hickey et al., 2020; Koutra et al., 2016; Rienecke & Richmond, 2017; Schwarte et al., 2017). At the domain EE level, Alvarez-Jimenez et al. (2010) found that EE-Criticism was associated with duration of untreated psychosis in caregivers of individuals with FEP, whilst EOI was not associated with any illness variables, whereas a study that included caregivers of individuals with chronic psychosis found that EOI, but not EE-Criticism, was associated with symptom severity (Koutra et al., 2016). Furthermore, for some caregivers, EE ratings change over time (Möller-Leimkühler & Obermeier, 2008a; Patterson et al., 2005; Santos et al., 2001; Scazufca & Kuipers, 1998), suggesting that some aspects of high EE are a response to dealing with the crisis of an ill relative (Santos et al., 2001).

However, some research has shown that EE may have a stronger association with caregiver factors than illness factors. For example, Silk et al. (2009)

found no differences in EE-Criticism between mothers of children who had current, remitted, or who were at a higher risk for experiencing depression, although EE was higher in these groups than it was in mothers of children who did not have mental health difficulties. Furthermore, a recent study found that caregivers' psychological distress and attributions of blame towards the service user were a greater predictor of EE-Criticism and EOI than service users' illness factors at both baseline and six-month follow-up (Hinojosa-Marqués et al., 2020). However, these studies did not take into account the possible contribution of life stressors to EE, although Silk and colleagues did control for socio-economic status. When these factors are considered, caregiver characteristics, EE, and additional life stressors (e.g. financial strain, employment stress) experienced by the caregiver may have a greater impact on caregiver burden than the service users' symptoms and functioning (Möller-Leimkühler & Obermeier, 2008b).

Taken together, these findings suggest that high EE is likely to be the result of a dynamic and reciprocal interaction between general life stressors, illness and caregiver characteristics. In line with this, a longitudinal study by Hickey et al. (2020) found evidence for a bi-directional relationship between EE and behavioural difficulties in children with autism after controlling for potential additional stressors such as income and whether other children in the family have any difficulties.

Caregiver psychological characteristics and Expressed Emotion in clinical samples

Hooley and Gotlib (2000) propose that EE can be conceptualised within a diathesis-stress model framework, whereby relative's characteristics, such as particular personality traits, place them on a continuum of vulnerability for expressing criticism, hostility or EOI towards certain behaviours of an unwell family member that they experience as stressful. The caregiver's response may then result in an exacerbation in the individual's symptoms that in turn may lead to even higher

levels of EE in the caregiver. The model suggests that under enough stress, all caregivers could respond with high EE towards their loved one. This is important to keep in mind, as the EE construct can lead some clinicians to have negative perceptions of caregivers who are high in EE (Falloon, 2003). Knowledge of what psychological characteristics are associated with EE can help us to understand more about the mechanisms that make some individuals more predisposed than others to expressing high EE when caring for an unwell family member.

To date, much of our understanding about caregiver personality characteristics that are associated with EE has come from studies looking at the correlates of EE in caregivers of individuals with psychosis. Relatives who are rated as high in EE-Criticism appear to have a more internal locus of control compared to relatives rated as low in criticism (Ashraf et al., 2010; Hooley, 1998). Hooley speculated that relatives who believe that they are able to control their own behaviours might be more likely to assume that others can do the same (Hooley, 1998). On the other hand, Bentsen et al. (1997) did not find a relationship between internal locus of control and EE domains, but did find that caregivers who scored higher in EOI were more likely to perceive their life as being down to chance, a form of external locus of control, whereas more critical caregivers were more likely to care about complying with the wishes of others who have power over them. The discrepancy between the studies may be accounted for by cultural differences between the samples, or by the fact that the studies used different measures of LOC. Higher EE has also been associated with higher self-criticism (Docherty et al., 1998) and with feeling less capable (Hooley & Hiller, 2000), and higher EE-criticism has been associated with lower self-esteem (Kuipers et al., 2006).

Findings from research looking at EE and personality have been inconsistent and at times contradictory, with different studies finding evidence of a relationship between higher EE and; higher neuroticism, lower neuroticism, extraversion, introversion, independence, and norm-favouring (King et al., 2003; Möller-

Leimkühler & Wiesheu, 2012; Sanger, 1997), whilst low EE has been associated with being open, reserved, trusting, self-reliant, relaxed, introverted, accommodating, tolerant, flexible, empathic, and valuing achievement via independence (Hooley & Hiller, 2000; Sanger, 1997; Van Humbeeck et al., 2002). Fewer studies have looked at the relationship between EE domains and personality, although EOI has been positively associated with neuroticism and conscientiousness (King et al., 2003; Van Humbeeck et al., 2002). Despite the apparently conflicting findings, the differences found in the personality profiles of relatives rated as high or low EE suggest this is an area worthy of further investigation. Furthermore, as all the aforementioned studies of EE and personality have been with caregivers of individuals with psychosis or other mental illnesses, it is not yet known whether personality predicts EE in non-clinical populations.

Expressed Emotion in non-clinical populations

Despite the fact that the construct of EE can be considered relevant to all significant interpersonal relationships, surprisingly few studies have looked at EE in the general population. Those that have, have found that some participants from non-clinical populations do meet thresholds for high EE, although in significantly lower numbers compared with caregivers of individuals from clinical populations (Brückner et al., 2008; Kershner et al., 1996; Lindhout et al., 2009; Ramsauer et al., 2013). This suggests that high EE is not purely a consequence of caring for someone with a physical or mental health difficulty. One such study looked at individuals who had self-identified as being happily married and found that 9% of the sample (7 people) were categorised as high EE, so levels of EE are likely to have been higher in a more general sample of couples (Brückner et al., 2008). In research conducted with Italian parents of school aged children, roughly one fifth were rated as high EE (Delvecchio et al., 2014). Furthermore, a study that compared parents of children who had been referred to a mental health service and

parents of children who had not been referred found that both groups contained a relatively high proportion of parents rated as high in EE, although the clinical group had a significantly greater number of parents who were given this rating (Kershner et al., 1996).

Higher parental EE has been associated with non-clinical samples of children and young people scoring higher on measures of mental health difficulties (Cap & Dag, 2019; Han & Shaffer, 2014). In regards to the direction of the relationship between higher EE and symptoms of mental health difficulties, a longitudinal study by Hale et al. (2011) found that adolescent's internalizing and externalizing symptoms predicted caregiver EE, but they also find evidence of a bi-directional effect between mother's scores on the irritability subscale of the Level of Expressed Emotion scale (Cole & Kazarian, 1988) and adolescents' symptoms. Whilst these studies suggest there may be value in investigating EE as a risk factor for the development of mental health difficulties, more evidence is needed about what caregiver factors may be risk factors for high EE.

Personality and communication research in non-clinical populations

EE is about how we communicate and express our emotions to the individuals that we care for. Relatively few studies have looked at the relationship between personality and communication styles (Jensen, 2016). Extraversion, agreeableness, openness, and conscientiousness have been associated with having an expressive and precise communication style, whilst higher scores on the neuroticism domain have been associated with being verbally aggressive, emotional, and the use of acquiescence and deception (Kottawatta, 2019; Weaver, 2005). Extraversion has also been associated with being more supportive and using a non-directive communication style, and individuals who have a more impulsive and non-conformist personality type may endorse a socially callous communication style and reject nondirective communication styles (talking,

conciliatory) (Weaver, 2005). Openness has been associated with preference for a direct communication style and agreeableness with an indirect communication style (Jensen, 2016). Cultural differences in communication and use of different measures are likely to account for some of the contradictory findings.

Amongst road accident survivors, more negative attitudes to expressing emotion are related to lower scores on the openness, extraversion and agreeableness domains (Nightingale & Williams, 2000). Furthermore, a review of research looking at the relationship between personality factors and relationship satisfaction found that individuals who reported greater satisfaction tend to score lower on neuroticism and higher on agreeableness and conscientiousness (Weidmann et al., 2016). Taken altogether, these findings indicate that our personality style affects the way that we communicate with others and that it may also influence our attitudes about expressing emotion and how we experience our close relationships. Given this, it is of interest to investigate whether certain personality traits may also be predictive of EE in non-clinical populations.

Study rationale

Research so far has focused on the emotional and cognitive correlates of high EE in caregivers of individuals with physical and mental health difficulties. However, criticism and EOI are likely to be present in significant relationships even in the absence of these difficulties, yet little is known about what personality characteristics predict high EE in the general population. This knowledge can be helpful in several ways. Firstly, it can help us to understand more about the factors that contribute to why some individuals express higher EE than others. In turn, this can help us to identify profiles of caregivers who may benefit from additional individual interventions that can highlight the factors that may be playing a role in their levels of EE. Secondly, it can improve our understanding of how individual differences might contribute to the development of EE over time and the possible

functions of high EE, which may help encourage a compassionate understanding of this type of caregiving response.

The present study sought to investigate whether previous findings linking EE with locus of control, personality traits, and self-criticism are replicated in a non-clinical sample of individuals completing a self-report measure of EE about their significant other. As findings from research looking at the relationship between locus of control and EE and personality and EE have been contradictory, these analyses were exploratory. Given that EE is a measure of interpersonal communication, the study also intended to explore whether individuals who are higher in EE experience more difficulties in their relationships generally.

Aims and hypotheses:

1. Investigate the hypothesis that higher EE-Criticism and EOI would be predicted by greater self-criticism
2. Conduct exploratory analyses to identify whether EE-Criticism and EOI were predicted by any of the following variables:
 - 2.1 Locus of control
 - 2.1 Interpersonal difficulties
 - 2.1 Personality traits

These analyses controlled for past and present mental and physical health difficulties in the participant and their significant other, and type of relationship between the participant and their significant other.

Method

Setting

Participants were invited to take part in an online study using the platform Qualtrics, a GDPR compliant cloud-based tool for creating research surveys

(<https://www.qualtrics.com>). An online study was chosen in order to try and recruit a larger sample, including people residing outside of the United Kingdom (UK).

Participants and recruitment

According to Soto and John (2017b), it was estimated that in order to have 80% power to detect a small effect, approximately 220 participants would need to be recruited. Two-hundred-and-eighty-two respondents consented to take part in the study. Of these, 250 participants completed the entirety of the study and were included in the analysis, 22 did not provide any data, 11 provided some demographic data but did not complete any of the outcome measures, and ten began completing the outcome measures but did not finish them.

Participants were recruited via study advertisements shared through email, social media/ communication sites (such as Facebook, WhatsApp and Twitter), and via word of mouth using snowball sampling (see Appendix 2 for example of emails). Prospective participants accessed the information sheet and consent form (Appendices 3 and 4) via a web link included in the study advertisement. In order to incentivise people to take part and as a 'thank you' for their time and effort, participants were offered the option of being entered into a prize draw with a chance to win one of five £50 Amazon vouchers.

Inclusion criteria

Participants were informed that in order to be eligible to take part they had to be aged 18 or over, able to read English, have sufficient IT skills to navigate the online survey system, and be living with a partner or relative. The partner or relative had to be someone who they would take a significant role in caring for, should the partner or relative become unwell (physically or mentally). This individual was referred to as a 'significant other'. Potential participants were informed that participation in the study would involve answering some questions about their significant other.

Study design and procedure

The study employed a cross-sectional design and collected quantitative data from self-report measures. Once participants had given their consent to take part, they were directed to complete a series of questionnaires, some of which were about themselves, and some of which were about their significant other.

Ethics

Ethical approval for the study was granted by the Research and Ethics Committee of University College London. (Ref 15737/001 2; see appendix 5). Participants were only able to begin the study if they provided their informed consent through the online consent form. Consent was given by clicking a button to say that they had read, understood, and agreed to all items on the consent form, and wished to continue to the study. Participants were presented with a debrief page at the end of the study (Appendix 6).

Measures

Socio-demographic questionnaire

Participants were asked to provide their age group, gender, country that they currently live in, nationality, ethnic group, highest level of education reached, and employment status (Appendix 7).

Experience of mental or physical health difficulties and relationship to significant other

Participants were asked to provide a 'yes' or 'no' answer to the following: whether they currently had a mental health difficulty, whether they had ever had a mental health difficulty in the past, whether they currently had a serious or long-term physical health difficulty, whether they had ever had a serious or long-term physical health difficulty in the past, whether their significant other currently has a mental health difficulty, whether their significant other has had a mental health difficulty in

the past, whether their significant other currently has a serious or long-term physical health condition, and whether the significant other has had a serious or long-term physical health condition in the past. This made a total of eight binary variables.

If they answered 'yes' to any of these questions, participants were provided with space to state what physical and mental health difficulties they or their significant other were currently experiencing or had experienced in the past. Participants were provided with two examples of mental health difficulties: depression and bipolar disorder, and three examples of serious or long-term physical health difficulties: diabetes, cancer and arthritis.

Participants were asked to state their relation to the significant other who they were answering the questions about by selecting from a drop-down menu e.g. partner, child, parent, sibling etc. Participants were also asked how long ago the significant other experienced the physical or mental health difficulty, and whether they considered themselves to have ever taken a significant role in caring for their significant other during the time that they experienced the difficulty (see Appendix 8).

Expressed Emotion measure

The Family Questionnaire (FQ) (Wiedemann et al., 2002) was used to measure EE. The FQ is a 20 item self-report measure for caregivers that is regularly used in EE research. Participants were asked to have their significant other in mind as they completed this questionnaire. It has two subscales, both with ten items. One subscale measures EOI (for example, 'I regard my own needs as less important') and one measures criticism (for example, 'He/ she irritates me'). Participants then choose which response feels most applicable from a Likert scale where 1 = Never/ Very Rarely, to 4 = Very Often.

The FQ can be used as a dichotomous variable or as a continuous variable, with higher scores indicating greater EE. In the present study, the measure was

used as both a continuous and a dichotomous variable for calculating descriptive statistics, and as a continuous variable only for the remainder of the analyses. This decision was made as it was assumed that fewer participants would meet cut-off scores for high EE given that it was a general population sample where participants are less likely to be currently caring for a significant other experiencing a physical or mental health difficulty. Participants responses were summed to give a total EOI score, a total criticism score, and a total overall EE score.

Following a conversation with one of the authors of the FQ, two items that were not applicable to a general population sample were removed from the questionnaire. These were item 5: 'I keep thinking about the reasons for his/ her illness' and item 15: 'I thought I would become ill myself'. Therefore the version of the FQ used in the present study contained 18 items, ten measuring criticism and eight measuring EOI. The maximum score on the criticism subscale was therefore 40, and 32 on the EOI subscale. The maximum total score for EE was 72.

Wiedemann and colleagues found that the FQ has good concurrent validity with the Camberwell Family Interview (CFI) (Vaughn & Leff, 1976; Wiedemann et al., 2002), which is considered the gold-standard measure of EE (Amaresha & Venkatasubramanian, 2012). In their study, the FQ was able to correctly identify an individual classified as high or low EE on the CFI in 74% of cases. They also found that the FQ has good test-retest reliability ($r=0.84$ for the criticism subscale and $r=0.91$ for the EOI subscale) (Wiedemann et al., 2002).

Self – criticism

Self-criticism was measured using The Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale (FSCRS) (Gilbert et al., 2004). This is a 22-item self-report measure that includes three subscales: 'inadequate-self', 'hated-self', and 'reassured-self'. The first two subscales are thought to be measures of self-criticism, and the 3rd is thought to measure a person's ability to self-reassure. Each subscale

has a list of statements and the respondent has to indicate to what extent that statement is true for them, using a Likert scale from 0, not at all like me to 4, extremely like me.

The 'inadequate-self' scale measures an individual's sense of personal inadequacy (for example, 'there is a part of me that feels that I am not good enough'). The 'hated-self' scale is thought to measure a person's desire to hurt themselves and feelings of self-disgust or hate (for example, 'I have a sense of disgust with myself'). The reassured-self subscale includes items such as 'I am gentle and supportive with myself'. The scores on each of the items are summed to provide a total score as well as a score for each of the three subscales. Higher scores on the inadequate-self and hated-self subscales indicate greater self-criticism and higher scores on the reassured-self subscale indicate a greater ability to self-reassure. Internal consistency for the subscales is high; Cronbach alphas were .90 for the inadequate-self subscale and .86 for the hated-self and reassured-self subscales (Gilbert et al., 2004). The FSCRS has been validated for use with both clinical and non-clinical populations (Baiao et al., 2015).

Locus of control

Locus of Control was measured using the Locus of Control of Behaviour Scale (LCB) (Craig et al., 1984). It is a 17-item self-report scale, with 10 statements relating to external locus of control (e.g. 'A great deal of what happens to me is just a matter of chance') and seven statements relating to internal locus of control (e.g. 'I can anticipate difficulties and take action to avoid them'). Participants are asked to rate the extent to which they agree with each statement using a six-point Likert scale from 0, 'strongly disagree' to 5, 'strongly agree'. The scores for the statements relating to internality are transposed. Higher scores are believed to indicate that the person has an external locus of control, and lower scores indicate an internal locus

of control. The scale has evidence of good test-retest reliability at 6 months ($r=0.73$) (Craig et al., 1984).

Interpersonal difficulties

Interpersonal difficulties were measured using The Inventory of Interpersonal Problems - 32 (IIP-32) (Barkham et al., 1996). The IIP-32 is a 32-item questionnaire with statements relating to interpersonal relationships. The first 19 statements begin with the stem 'It's hard for me to...' (e.g. 'join in on groups'), and the remaining items begin with the stem 'the following are things that you do too much...' (e.g. 'I fight with other people too much'). Participants are asked to indicate the extent to which they believe that the statement is true using a five-point Likert scale from 0, 'not at all' to 4, 'extremely'. Scores for different subscales such as 'sociable', 'assertive' and 'caring' can also be calculated. However, in order to maximise power for the present study, only the total score was used, with higher scores indicating more interpersonal difficulties. The IIP-32 has a reliability coefficient of .90 and is suitable for use with both clinical and general population samples (Barkham et al., 1996).

Personality

Personality was measured using The Big Five Inventory (BFI) 2 – Short form (BFI-2-S) (Soto & John, 2017b), a 30-item self-report measure. Each item begins with the stem 'I am someone who...' followed by different characteristics that represent one of The Big Five personality domains: extraversion, agreeableness, conscientiousness, negative emotionality, and open-mindedness. For example, one item from the extraversion domain scale is 'is full of energy'. Participants are asked to indicate the extent to which they agree or disagree with each statement using a five point Likert-scale from 1, 'disagree strongly' to 5, 'strongly agree'. The scores for each subscale are then summed and an average score is calculated for each domain. Each personality domain also has three facet sub-scales, however for the

current study only domain level scores were calculated in order to ensure that adequate statistical power was reached with the sample size.

The original BFI (John et al., 1991) has been used extensively in psychological research (Soto & John, 2017a). The BFI-2-S was chosen as it is a relatively short measure that has good reliability ($r = 0.73 - 0.84$) and predictive power with other self-report and peer report measures, whilst also providing good bandwidth and fidelity across personality traits (Soto & John, 2017b).

Analysis

Descriptive statistics for the socio-demographic variables, participant experiences of physical and mental health variables, and variables related to the significant others experiences of physical and mental health were calculated using frequency analysis. As the participants were found to be socio-demographically homogenous it was not possible to conduct further analyses looking at whether socio-demographic factors affect the relationship between EE and the other outcome variables.

Means and standard deviations were calculated for EE and each of the predictor variables. For EE-Criticism, a cut-off score of 24 and above was used to identify high EE-Criticism as defined by the Family Questionnaire (Wiedemann et al., 2002). For EOI, given that the EOI subscale used in this study had a total of 32 instead of 40, a cut-off score that was proportional to that used in the original study (Wiedemann et al., 2002) was applied, so that a score of 23 and over indicated high EOI. High EE was defined as anyone who scored above the cut-offs on one or both of the domain scales (Wiedemann et al., 2002).

Linear multiple regressions were used to identify whether The Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale subscales, Inventory of Interpersonal Problems – 32 score, Locus of Control of Behaviour Scale score, and the Big Five Personality Inventory-2-S domains predicted EOI or EE-criticism, after controlling for

relationship type and physical or mental health difficulties. In order to do this, a separate multiple regression model was run for each predictor variable of interest for EE-Criticism and EOI. Relationship type, whether or not the participant had a current or past mental health or physical health difficulty, and whether or not their significant other had a current or past physical or mental health difficulty were included as control variables. For example, in one model EE-Criticism was used as the dependant variable, and the independent variables were total LOC score plus the control variables.

Two 'final' multiple regression models were run with EOI and criticism as the dependant variables. For the final EE-Criticism model, predictor variables that had shown to significantly predict EE-Criticism in the individual models were included along with the control variables. This process was repeated for EOI. The aim of these analyses was to identify which of the measures, if any, significantly contributed to EE-Criticism and EOI after controlling for all other variables. For all regression analyses the total sum of items was used for the IIP and the BFI-2-S as opposed to the mean item totals. All analyses were conducted using SPSS version 25.

The data was checked to ensure that it met the following assumptions for multiple linear regression: no perfect multicollinearity, homoscedasticity, no influential outliers, independence of errors, normally distributed errors, and linearity. Multicollinearity was assessed by checking that there were no correlations between variables greater than $r = .80$, and that there were no variance inflation factor (VIF) values greater than ten. Independence of errors was checked using the Durbin-Watson test, with exact acceptable values looked up in the Durbin and Watson (1951) paper. Outliers were checked using Cook's distance, with values greater than one considered cause for concern in accordance with Cook and Weisberg (1982). For each regression model, the data was checked for linearity between the dependent variable and all the predictor variables, as well as between the

dependant variable and each of the continuous independent variables. Lastly, Bonferroni corrections were applied, resulting in a significance level set at $p \leq 0.002$.

Results

Sample descriptives

Socio-demographic characteristics

Participant socio-demographic data is presented in Table 1. The majority of the sample (78%) were female, aged 25-34 (52%), identified as white (83%) and British (81%), were working or studying (83%) and had a degree level or above (89%). The vast majority of the sample answered the EE questionnaire about their partner/ spouse ($n = 209$, 84%). For the purpose of the analyses, response categories for relationship type were collapsed into two categories: partner/ spouse, and relative (including child, sibling, parent, mother/ father in law, grandparent/ step-grandparent, cousin and niece, $n = 41$, 16%).

Participant's experience of mental or physical health difficulties

The majority of the sample reported that they were not currently experiencing a mental health difficulty (87%, $n = 217$). However, past experience of mental health difficulties were common (42%, $n = 106$). Of the 33 participants (13%) who reported having a current mental health difficulty, over half ($n = 17$) reported experiencing both depression/ low mood and anxiety. All but one of the mental health difficulties reported came under the umbrella term of 'common mental health disorders' (National Institute for Health and Care Excellence, 2011). Of the participants who had experienced a mental health difficulty in the past, most reported experiencing one ($n = 60$, 57%) or two ($n = 40$, 38%) difficulties. The most common past mental health difficulties reported were depression, anxiety, and eating disorders.

Table 1

Socio-demographic Characteristics of Participants, Relationship Type, and Participant and Significant Other Experience of Mental and Physical Health Difficulties. n = 250

	<i>n</i>	<i>%</i>
Participant demographics		
Female	195	78%
Age (years)		
18-24	18	7%
25-34	129	52%
35-44	43	17%
45-54	7	3%
55-64	26	10%
65-74	26	10%
Over 84	1	<1%
Ethnicity		
Asian/Asian British	26	10%
Black/ Black British/ Caribbean/ African	2	1%
Mixed or multiple ethnic groups	7	3%
Other ethnic group	8	3%
White/ White British	207	83%
Employment status		
Employed	156	62%
Self-employed	29	12%
Retired	34	14%
Studying	23	9%
Looking after home or family	3	1%
Long term sick or disabled	1	< 1%
Other	4	2%
Education		
Degree level or above	222	89%
A-Level, Apprenticeship, NVQ Level 3, BTEC National, City & Guilds Craft	20	8%
NVQ Level 2, BTEC general, City & Guilds Craft	1	<1%
5 of more GCSE's, O-Levels (passed), or CSE's	3	1%
Any other GCSE's, O-Levels or CSE's (any grades), Basic Skills course	1	<1%
Any other qualifications, equivalent unknown	2	<1%
No qualifications	1	<1%
Relationship type		
Partner/ Spouse	209	84%
Son/ daughter	9	4%
Sibling	9	4%
Parent	19	8%
Mother in law/ father in law	1	<1%
Grandparent/ step grandparent	1	<1%
Cousin	1	<1%
Niece	1	<1%
Participant mental health		
Present mental health difficulty ^{a, b}	33	13%
Past mental health difficulty ^{a, c,}	106	42%
Number of past mental health difficulties (range)	1-4	

	<i>n</i>	%
Participant Physical Health		
Present physical health difficulty ^a ,	25	10%
Number of physical health difficulties currently experienced by participants (range)	1-3	
Past physical health difficulty ^a	23	9%
Significant other's mental health		
Present mental health difficulty ^{a, d}	38	15%
Number of mental health difficulties currently experienced by significant others (range) ^e	1-5	
Past mental health difficulty ^{a, f}	67	27%
Number of mental health difficulties experienced by significant others in the past (range)	1-4	
Significant other's physical health		
Present physical health difficulty ^{a, g}	20	8%
Past physical health difficulty ^{a, h}	35	14%

Note.

^a Reflects the number and percentage of participants answering “yes” to this question

^b Types of current mental health difficulty reported: anxiety and depression (n = 17), anxiety (n = 9), depression/ low mood (n = 5), Obsessive Compulsive Disorder (OCD, n = 1), Emotionally Unstable Personality Disorder (n =1).

^c Types of past mental health difficulty reported: depression (n = 73), anxiety (n = 54), eating disorders (n= 13), panic attacks (n=3), OCD (n=2), Post Traumatic Stress Disorder (PTSD, n= 2), body dysmorphia, health anxiety, social anxiety, self-harm, substance misuse and anger (all n= 1).

^d Types of mental health difficulty currently experienced by significant others: depression (n=25), anxiety (n = 17), OCD (n=2), agoraphobia, stress, dissociative disorder, panic attacks, bipolar disorder and schizophrenia (all n = 1). One participant reported that their significant other had memory problems.

^e Types of mental health difficulty experienced by significant others in the past: depression (n=43), anxiety (n =29), panic attacks (n = 4), OCD, eating disorders (both n =3), self-harm, addiction (both n =2), agoraphobia, low self-esteem, PTSD, anger, dissociative disorder, health anxiety, grief, schizophrenia, psychosis, and borderline personality disorder (all n=1).

^f = The most common health conditions currently experienced by significant others were arthritis (n=4, 20%) and diabetes (n=3, 15%)

^g = The most common past physical health difficulties were heart conditions (n=6), cancers (n=6) and pain (n=6).

The majority of participants reported that they were not currently experiencing a serious or long-term physical health difficulty (90%, n= 225) and that they had not experienced one in the past (91%, n= 227). The most commonly reported difficulties were cardiovascular conditions, chronic pain or inflammatory bowel disease (all n = 4). A similar range of disorders were reported for the 'past experience of a physical health problem' item.

Significant other's experience of physical and mental health difficulties

Overall, 42% of the sample (n = 104) reported that their significant other was currently experiencing a physical or mental health difficulty, and/ or had experienced one in the past. Only 15% of participants reported that their significant other was currently experiencing a mental health difficulty (n = 38), whereas 27% reported that their significant other had experienced a mental health difficulty in the past (n = 67). The most frequently reported difficulties were depression followed by anxiety, and most reported one mental health difficulty, either now (n=34, 51%) or in the past (n=55, 82%). Of the 78 participants (31%) who reported their significant others had experienced a mental health difficulty currently and/ or in the past, 59% (n=46) reported that they would consider themselves to have taken a significant role in caring for their partner/ relative during the time that they experienced the mental health difficulty.

Physical health difficulties amongst significant others were less common, with only 8% of participants (n = 20) reporting that their significant other was currently experiencing a physical health difficulty, and 14% (n=35) reporting that their significant other had experienced a physical health difficulty in the past. The most common health conditions currently experienced by significant others were arthritis and diabetes and the most common past physical health difficulties were heart conditions, cancers, and pain. Of the 44 participants (18%) who reported that their significant other had experienced a serious or long-term physical health

difficulty now and/ or in the past, 58% (n = 26) said that they would consider themselves to have taken a significant role in caring for their loved one during the time that they experienced the physical health difficulty.

Overall, 26% of the sample (n=65) reported that they had taken a significant role in caring for their significant other during a time that they experienced a physical and/ or mental health difficulty.

Descriptives for Expressed Emotion and predictor variables

Full descriptive statistics for EE and predictor variables can be seen in Table 2. The large majority of the sample (N = 197, 79%) did not meet threshold for high EE using the adapted thresholds from the Family Questionnaire (Wiedemann et al., 2002). The mean total EE score was 35.46 ($SD = 8.01$). Forty participants (19%) met the threshold for high EE- Criticism (mean = 18.54, $SD = 5.34$), and twenty participants (8%) met the threshold for high EOI (mean = 16.93, $SD = 3.57$). Of the 53 participants (21%) who met the threshold for high EE (EE-total or domain), 34% (n = 18) reported that their significant other was *not* currently experiencing a physical or mental health difficulty and nor had they in the past. Meanwhile, of the 197 participants (79%) who met criteria for low EE, only 35% (28% of the whole sample; n = 69) reported that their significant other had a past or present physical or mental health difficulty.

The mean scores on the Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale subscales were only slightly lower than the means in the non-clinical sample of female students participating in the Gilbert et al. (2004) study. In the present study, the scores on the inadequate, reassured-self and hated-self scales were 15.70, 19.56, and 3.14 respectively, compared to 16.75, 19.81 and 3.86 found by Gilbert et al. (2004). Most of the sample had very low scores on the hated-self subscale. The mean LOC score was 39.61, which is considerably greater than

Table 2*Descriptive statistics for Expressed Emotion and predictor variables*

	<i>M</i>	<i>SD</i>
Expressed Emotion (FQ)		
Total EE	35.47	8.02
EE-Criticism	18.54	5.34
EOI	16.93	3.57
Self Criticism (FCSRS)		
Inadequate self	15.70	8.53
Hated self	3.14	4.07
Reassured self	19.56	5.80
Locus of Control (LCB)	39.61	6.26
Interpersonal Difficulties (IIP-32)	31.73	15.96
Personality (BFI-2-S)		
Extraversion	3.06	0.36
Agreeableness	3.33	0.39
Conscientiousness	3.29	0.39
Negative emotionality	3.28	0.36
Openness	3.09	0.42

Note. FQ = Family Questionnaire; EE = Expressed Emotion; EOI = Emotional Over-Involvement; FCSRS = Forms of Self-Criticising/ Attacking & Self-Reassuring Scale; LCB = Locus of Control of Behaviour Scale; IIP-32 = Inventory of Interpersonal Problems – 32; BFI-2-S = Big Five Inventory-2-Short form

the mean of 27.2 found in a sample of university students and academics in a study by McCay-Peet et al. (2015). On average, participants scored the highest on the Agreeableness subscale of the BFI-2-S (mean = 3.33, $SD = 0.39$), and the lowest on the Extraversion subscale (mean = 3.06, $SD = 0.36$).

Exploring study aims

The results of the multiple linear regression analyses can be seen in Tables 3 and 4. Some of the models did not meet all the assumptions for multiple linear regression. In particular, there were issues with heteroscedasticity in the data, which then made it difficult to determine whether there was linearity when examining the scatterplots of the studentised residuals against the unstandardized predicted values. The level of heteroscedasticity across the models was deemed to be unavoidable given that the models contained multiple binary variables. However, it is possible that these violations may affect the extent to which the findings can be generalized beyond the sample. See Appendix 9 for further details of the assumption violations.

Aim 1: Investigate hypothesis that higher Expressed Emotion-Criticism and EOI will be predicted by higher self-criticism

In support of the hypothesis that higher self-criticism would predict higher EE-domains, increases in inadequate-self and hated-self scores predicted greater EE-Criticism (inadequate-self: $B = 0.138$; hated-self: $B = 0.208$) and EOI (Inadequate-self: $B = 0.106$; hated-self: $B = 0.213$). Meanwhile, greater reassured-self scores predicted lower EE-Criticism ($B = -0.158$) and EOI ($B = -0.157$). After applying the Bonferroni correction, the inadequate-self subscale still significantly predicted both EE domains and the hated-self and reassured-self subscales still significantly predicted EOI.

Table 3

Summary of multiple linear regression analyses for each predictor variable with EE-Criticism as the dependent variable.

Each line in the table represents a different multiple regression model for each predictor variable. All models included whether or not the participant and the relative had a current or past mental health difficulty, and the relationship type as covariates. $n = 250$.

	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	<i>t</i>	<i>p</i>
		<i>LL</i>	<i>UL</i>				
FCSRS - Inadequate self subscale	0.138	0.053	0.224	0.043	0.220	3.184	.002*
FCSRS - Hated self subscale	0.208	0.014	0.402	0.098	0.158	2.107	.036
FCSRS - Reassured self subscale	-0.158	-0.28	-0.036	0.062	-0.171	-2.545	.012
Locus of control	0.041	-0.071	-0.153	0.057	0.048	0.72	.472
Interpersonal difficulties	0.087	0.043	0.131	0.023	0.260	3.878	<.001*
Extraversion	-0.102	-0.41	0.206	0.156	-0.041	-0.650	.516
Agreeableness	0.153	-0.120	0.425	0.138	0.067	1.104	.271
Conscientiousness	0.046	-0.228	0.320	0.139	0.020	0.328	.743
Negative Emotionality	-0.147	-0.444	0.150	0.151	-0.060	0.975	.33
Open-mindedness	-0.342	-0.603	-0.081	0.133	-0.160	-2.581	.010

Note. Model = 'Enter' method in SPSS Statistics; *B* = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient; EE = Expressed Emotion; FCSRS = Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale

* = remained significant after applying post hoc correction for multiple comparisons.

Predictor variables that significantly predicted the dependant variable are highlighted in bold.

Table 4

Summary of multiple linear regression analyses for each predictor variable with EOI as the dependent variable.

Each line in the table represents a different multiple regression model for each predictor variable. All models included whether or not the participant and the relative had a current or past mental health difficulty, and the relationship type as covariates. $n = 250$.

	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	<i>t</i>	<i>p</i>
		<i>LL</i>	<i>UL</i>				
FCSRS - Inadequate self subscale	0.106	0.055	0.157	0.026	0.255	4.112	<.001*
FCSRS - Hated self subscale	0.213	0.098	0.329	0.059	0.244	3.645	<.001*
FCSRS - Reassured self subscale	-0.157	-0.229	-0.084	0.037	-0.255	-4.265	<.001*
Locus of control	0.104	0.037	0.170	0.034	0.182	3.063	.002*
Interpersonal difficulties	0.055	0.029	0.082	0.014	0.247	4.076	<.001*
Extraversion	-0.027	-0.214	0.159	0.095	-0.016	-0.287	.774
Agreeableness	0.110	-0.055	0.274	0.084	0.073	1.309	.192
Conscientiousness	0.067	-0.099	0.233	0.084	0.044	0.797	.426
Negative Emotionality	-0.011	-0.191	0.169	0.091	-0.007	-0.123	.902
Open-mindedness	-0.070	-0.230	-0.090	0.081	-0.049	-0.856	.393

Note. Model = 'Enter' method in SPSS Statistics; *B* = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient; EE = Expressed Emotion; EOI = Emotional Over-involvement; FCSRS = Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale

* = remained significant after applying post hoc correction for multiple comparisons.

Predictor variables that significantly predicted the dependant variable are highlighted in bold.

Aim 2.1: Explore whether Locus of Control predicts EE-Criticism and EOI

Higher locus of control score predicted higher EOI ($B = 0.104$) but not EE-Criticism. The association between locus of control and EOI was still significant after applying the Bonferroni correction.

Aim 2.2: Explore whether interpersonal difficulties predict Expressed Emotion-Criticism and Emotional Over-Involvement

Increases in Inventory of Interpersonal Problem scores predicted higher EE-Criticism ($B = 0.087$) and EOI ($B = 0.055$). These findings remained significant after applying the Bonferroni correction.

Aim 2.3: Explore whether any of The Big Five personality domains predict Expressed Emotion-Criticism and Emotional Over-Involvement

Extraversion, agreeableness, conscientiousness, and negative emotionality did not predict EE-Criticism or EOI. Openness was the only personality domain that predicted EE. Higher openness scores predicted lower EE-Criticism ($B = -.342$), but not EOI. However, the relationship between openness and EE-Criticism did not withstand the Bonferroni correction.

Comparison of models of Expressed Emotion-Criticism and Emotional Over-Involvement

As can be seen in table three, when comparing the standardised coefficients of the predictor variables that had made significant contributions to the different models of EE-Criticism, scores on the Inventory of Interpersonal Problems made the greatest unique impact on EE-criticism score ($\beta = .260$), followed by inadequate-self ($\beta = .220$), reassured-self ($\beta = -.171$), openness ($\beta = -.16$), and hated-self ($\beta = .158$). For the EOI models (Table 4), the inadequate-self and reassured-self subscales both made the greatest unique impact on EOI (inadequate -self: $\beta = 0.255$; reassured-self: $\beta = -0.255$), followed by scores on the Inventory of Interpersonal

Problems ($\beta = 0.247$), hated-self subscale ($\beta = 0.244$), and Locus of Control measure ($\beta = .182$).

Final regression models predicting Criticism and Emotional Over-Involvement

The predictor variables that had shown to significantly predict EE-Criticism in the individual multiple regression models were entered into a new model alongside the independent variables. As such, all three subscales from the Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale, Inventory of Interpersonal Problems, openness scores, mental health, physical health and relationship type variables were entered (see Table 5). Participants who scored higher on the interpersonal difficulties measure ($\beta = 0.194$) or who were answering the EE measure about a relative rather than a spouse ($\beta = 0.123$) scored higher on the EE-Criticism scale, whilst participants who did not currently have a mental health difficulty ($\beta = -0.146$), who were more open ($\beta = -0.155$), or who's significant others were not currently experiencing a mental health difficulty ($\beta = -0.131$), scored lower on the EE-Criticism scale. These relationships did not remain significant after applying the Bonferroni correction.

In the final EOI model (see table 6), all three subscales from the Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale, Inventory of Interpersonal Problems scores and Locus of Control scores were entered along with relationship type and the mental and physical health variables. Participants who's significant other did not currently have a mental health difficulty had lower scores on the EOI subscale than participants who's significant other did currently have a mental health difficulty ($\beta = -0.304$), whilst participants who answered the EE measure about a relative scored higher on the EOI scale than participants who were answering about a spouse ($\beta = 0.245$). These relationships remained significant after applying the Bonferroni correction.

Table 5

Multiple linear regression model for EE-Criticism, with all variables that had previously predicted EE-Criticism in the individual models included alongside the control variables (presence/ absence of past or present physical or mental health difficulties in the participant and their significant other, and relationship type). n = 250.

	B	95% CI for B		SE	β	t	Sig.	R ²	Δ R ²
		LL	UB						
Model								.205	.157
Constant	25.465	18.076	32.855	3.751		6.789	<.001		
Participant - current mental health difficulty	-2.294	-4.514	-.075	1.127	-0.146	-2.037	.043		
Participant - past mental health difficulty	0.681	-0.826	2.188	0.765	0.063	0.890	.374		
Participant - Current physical health difficulty	1.431	-0.802	3.664	1.133	0.080	1.263	.208		
Participant - Past physical health difficulty	0.143	-2.177	2.463	1.178	0.008	0.121	.904		
Significant other - Current mental health difficulty	-1.939	-3.897	0.019	0.994	-0.131	-1.951	.052		
Significant other - Past mental health difficulty	-0.877	-2.481	0.728	0.814	-0.073	-1.076	.283		
Significant other Current physical -health difficulty	-0.458	-2.905	1.989	1.242	-0.023	-0.369	.713		
Significant other - Past physical health difficulty	0.094	-1.871	2.059	0.998	0.006	0.094	.925		
Relationship type	1.778	-0.002	3.558	0.904	0.123	1.968	.050		
Inadequate self ^a	0.039	-0.084	0.161	0.062	0.062	0.622	.534		
Reassured self ^a	-0.051	-0.197	0.095	0.074	-0.056	-0.690	.491		
Hated Self ^a	0.015	-0.229	0.259	0.124	0.011	0.121	.904		
Interpersonal difficulties ^b	0.065	0.010	0.120	.028	0.194	2.349	.020		
Openness ^c	-0.331	-0.588	-0.074	0.130	-0.155	-2.541	.012		

Note. Model = 'Enter' method in SPSS Statistics; EE = Expressed Emotion; B = unstandardized regression coefficient; CI = confidence interval; LL = lower limit; UL = upper limit; SE B = standard error of the coefficient; β = standardized coefficient; ^a = subscale from the Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale; ^b = measured by the Inventory of Interpersonal Problems – 32; ^c = measured by the Big Five Personality Inventory-2 – Short Form.

* = remained significant after applying post hoc correction for multiple comparisons.
Significant predictor variables highlighted in bold.

Table 6

Multiple linear regression model for Emotional Over-Involvement (EOI), with all variables that had previously predicted EOI in the individual models included alongside the control variables (presence/ absence of past or present physical or mental health difficulties in the participant and their significant other, and relationship type). n = 250.

	B	95% CI for B		SE	β	t	Sig.	R ²	ΔR^2
		LL	UB						
Model								.359	.321
Constant	19.511	15.079	23.943	2.25		8.673	<.001		
Participant - current mental health difficulty	-0.295	-1.631	1.042	0.678	-0.028	-0.434	.664		
Participant - past mental health difficulty	0.473	-0.423	1.369	0.455	0.066	1.041	.299		
Participant -Current physical health difficulty	-0.464	-1.804	0.876	0.68	-0.039	-0.682	.496		
Participant - Past physical health difficulty	-0.340	-1.730	1.049	0.705	-0.028	-0.483	.630		
Significant other - Current mental health difficulty	-3.011	-4.191	-1.83	0.599	-0.304	-5.025	<.001*		
Significant other -Past mental health difficulty	0.091	-0.872	1.054	0.489	0.011	0.187	.852		
Significant other - Current physical health difficulty	-1.047	-2.513	0.419	0.744	-.080	-1.407	.161		
Significant other - Past physical health difficulty	-0.307	-1.486	0.872	0.598	-0.030	-0.512	.609		
Relationship type	2.357	1.294	3.421	0.540	0.245	4.366	<.001*		
Inadequate self ^a	0.023	-0.050	0.096	0.037	0.054	0.613	.541		
Reassured self ^a	-0.085	-0.173	-0.002	0.044	-0.139	-1.919	.056		
Hated Self ^a	0.05	-0.096	0.195	0.074	0.057	0.669	.504		
Interpersonal difficulties ^b	0.024	-0.009	0.057	.017	0.108	1.426	.155		
Locus of Control ^c	0.047	-0.024	0.117	0.036	0.082	1.310	.192		

Note. Model = 'Enter' method in SPSS Statistics; B = unstandardized regression coefficient; CI = confidence interval; LL = lower limit; UL = upper limit; SE B = standard error of the coefficient; β = standardized coefficient; ^a = subscale from the Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale; ^b = measured by the Inventory of Interpersonal Problems – 32; ^c = measured by the Locus of Control of Behaviour scale. Significant predictor variables highlighted in bold.

Discussion

Overview of findings

The present study set out to further our knowledge of psychological factors that predict the level of EE shown towards a significant other after controlling for the presence of physical and mental health difficulties in a non-clinical population. It sought to build on previous research with caregivers of individuals with mental health difficulties that have found relationships between EE and locus of control, self-criticism, and personality domains. It also sought to explore, for the first time, whether general interpersonal functioning is associated with EE.

It was found that being more self-critical and having more interpersonal difficulties was associated with higher EE-Criticism and EOI, whilst having a greater ability to reassure oneself predicted lower EE-Criticism and EOI. Openness was the only one of The Big Five personality domains that predicted EE, with participants who were more open scoring lower on EE-Criticism, but not EOI. Having a more external locus of control predicted greater EOI, but not EE-Criticism. Overall, the findings indicate that even when physical and mental health difficulties are controlled for, the level of EE that we express about a significant other can be predicted by particular psychological characteristics that we possess.

When comparing the unique contributions of the different measures to EE-Criticism and EOI score, change in scores on the Inventory of Interpersonal Problems led to the biggest change in EE-Criticism scores, followed by inadequate-self, whilst inadequate-self and reassured-self had the biggest impact in the EOI model. These relationships remained significant after applying corrections for multiple comparisons. The findings suggest that interpersonal difficulties and self-criticism might be particular diatheses for EE-Criticism, whilst self-criticism and difficulty reassuring oneself may be particular diatheses for EOI.

The sample

As expected given that the sample was not recruited from clinical services, the large majority of participants (79%, $n = 197$) did not meet threshold for high EE. Nineteen per cent met the threshold for high EE-Criticism and 8% met the threshold for high EOI. Just over two-thirds of these participants (66%, or 14% of the entire sample, $n = 35$) reported that their significant other had experienced a physical or mental health difficulty either now or in the past. When the significant other did not have any past or current physical or mental health difficulties, rates of high EE were low (12%, or 7% of the entire sample; $n = 18$). Furthermore, the presence of a current mental health difficulty in the significant other predicted higher EE (EOI and EE-Criticism) in over half of the regression models, whilst the presence of past physical or mental health difficulties in the significant other did not independently predict EE in any of the analyses. These findings support the theory that high EE is a response to dealing with the crisis of an ill relative (Santos et al., 2001).

A substantial proportion (42%) of the sample reported that their significant other had experienced a physical and/ or mental health difficulty now and/ or in the past, and 50% ($n = 126$) reported that they themselves had experienced a physical or mental health difficulty, currently and/ or in the past. Furthermore, 26% of the sample ($n=65$) reported that they had taken a significant role in caring for their loved one during a time that they experienced a physical and/ or mental health difficulty. This suggests that the study may have attracted individuals who had experiences of their own difficulties, or experiences of supporting their significant others through these difficulties. However, when looking at the breakdown of the prevalence of past, present, physical and mental health difficulties and comparing these to national statistics, the numbers in the sample were similar to or lower than they are in the general population (Mental Health Foundation, 2016; MIND, 2020; NHS

England, 2020)¹. Moreover, three in five people will be carers at some point in their lives (Carers UK, 2015), so the fact that just over one quarter of the sample identified with having taken a caring role for their significant other is again perhaps not unusual.

Sixty-six per cent (or 25% of the whole sample, n = 69) of those who reported past or present physical or mental health difficulties in their significant other did not meet threshold for high EE. The fact that most participants who met threshold for high EE reported that their significant other had a past or present physical or mental health difficulty (66%, n = 35), but only one third of participants who reported that their significant other had a past or present physical or mental health difficulty had high EE, may fit with the diathesis stress-model of EE (Hooley and Gotlib (2000). The model suggests that particular characteristics of relatives place them on a continuum of vulnerability for expressing high EE towards behaviours of an unwell family member that they experience as stressful. Therefore it could be that the participants in this study who's significant others had physical or mental health difficulties, but did not meet the threshold for high EE, did not have the personality characteristics that might have made them more predisposed to expressing high EE. However, it may be that factors that were not controlled for in the study, such as the severity of the significant others difficulty or adverse life circumstances, might account for why some participants whose significant others had a history of mental or physical health difficulties met threshold for high EE, whilst others did not.

In nearly every regression model, participants who were completing the EE measure about a relative had significantly higher EE-Criticism and EOI scores compared to participants who were completing the measure about their partner.

¹ In England, 1 in 4 people will experience a mental health difficulty each year, 43.4% of adults think that they have had a diagnosable mental health condition at some point in their life, and 15 million people in England have a long term health condition.

This supports previous research indicating that spouses of individuals with FEP have lower EE than relatives (Heikkilä et al., 2002). The fact that this difference in EE based on relationship type was found after controlling for past and present physical and mental health difficulties in both the participant and their significant other suggests that there is something specific to relationships with family members that makes us more likely to express higher EE. It may be that couples work harder at maintaining their relationship, as not doing so increases the risk that the other person will leave. This may therefore reduce the occurrence of behaviours that illicit a high EE response. Moreover, it may be that couple relationships where there is high EE are more likely to end, thereby reducing the prevalence of high EE. It is less likely that people will 'break-up' from their families, and this knowledge may mean that family members do not put as much effort into resolving points of conflict in the relationship.

Expressed Emotion and self-criticism

Both the hated-self and inadequate-self subscales of the Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale predicted total and domain level EE, supporting the study's hypothesis. Furthermore, the reassured-self subscale, which is thought to measure the extent to which an individual is able to be warm and encouraging towards the self when things go wrong for them (Gilbert et al., 2004), negatively predicted EOI and EE-Criticism scores. The findings support previous research indicating that caregivers of individuals with psychosis who are higher in EE are more self-critical (Docherty et al., 1998) and feel less capable (Hooley & Hiller, 2000), and that higher EE-criticism is associated with lower self-esteem (Kuipers et al., 2006). Furthermore, the present findings suggest that the ability to self-reassure may be protective against higher EE. However, the finding of a relationship between EE domains and the hated-self subscale needs to be interpreted with caution, as most of the sample had very low scores on this scale. It

is therefore likely that outliers accounted for the significant finding. On the other hand, given that this was a non-clinical sample and higher scores on the hated-self subscale are thought to be linked with more clinical levels of low self-esteem, lower scores are to be expected (Gilbert et al., 2004).

In the psychosis literature, low self-esteem has previously been considered as a response to the stresses of the caregiving role (Kuipers et al., 2006; Kuipers et al., 2010). However, the results of the present study indicate that self-criticism, which is an aspect of low self-esteem, is associated with EE even after controlling for the presence of mental and physical health difficulties in both the participant and their significant other. It is possible that participants are more self-critical as a consequence of being in a relationship that leads them to express greater EE, however, findings from a meta-analysis of longitudinal studies indicate that the relationship between people's social relationships and their level of self-esteem is reciprocal (Harris & Orth, 2019), so it seems possible that the self-criticism – EE relationship is reciprocal in this sample too.

The relationship between self-criticism and EE might be explained by attachment. Research has found that individuals who are lower in self-esteem report higher attachment anxiety and attachment avoidance (Berry et al., 2006). Attachment anxiety is associated with an excessive need for approval from others and fear of rejection and abandonment, whilst attachment avoidance is associated with negative image of others and self-reliance (Berry et al., 2006). A growing body of research has looked at the role of attachment in EE, and some studies have found a relationship between caregiver attachment style and EE (Cherry et al., 2018; Paley, 2000; Rapsey et al., 2015). Furthermore, some researchers have argued that high EE in caregivers of individuals with FEP can be considered part of an attachment response activated in reaction to the perceived loss of a loved one that aims to re-establish the relationship as it was pre-illness (Hinojosa-Marqués,

Domínguez-Martínez, Sheinbaum, et al., 2019; Patterson et al., 2005). It may be that the participants in the current study who were more self-critical and self-reported higher levels of EE-Criticism had an avoidant attachment style, and hence were more critical of their significant other due to a general negative image of others. On the other hand, those who reported more self-criticism and higher EOI may have had a more anxious attachment style and so are more likely to be self-sacrificing and over-protective as a way to get approval from their significant other, or to avoid abandonment.

Self-reassurance can be conceptualised as a form of self-compassion, which in turn is thought to be learned from early attachment experiences (Gilbert, 2010). In non-clinical samples, self-compassion has been related to use of compromise, less emotional distress and greater relational wellbeing during interpersonal conflicts (Yarnell & Neff, 2013). Thus it may be that in the present study, participants who had a greater ability to self-reassure were less likely to express criticism or EOI as they utilise healthier ways of responding to relationship difficulties.

Expressed Emotion and Locus of Control

The current study found that higher external locus of control predicted higher EOI. This finding is at odds with that of Hooley (1998), who did not find a relationship between EOI and locus of control. However, it partially supports the finding by Bentsen et al. (1997), who found that caregivers who scored higher in EOI were more likely to perceive their life as being down to chance (a form of external locus of control). Having an external locus of control has been associated with anxiety (Hoehn-Saric & McLeod, 1985), which in turn has been associated with EOI (Hesse & Klingberg, 2014). Thus it may be that participants who believe that their life is controlled by external factors may be more likely to perceive the world as dangerous and unpredictable, increasing the likelihood that they will be over-protective or express more worry about their loved one (Bentsen et al., 1997). This

hypothesis is supported by the fact that individuals in this sample who were more able to reassure themselves had lower EE, indicating this may serve a protective function against anxiety and therefore EOI.

Contrary to the findings of Hooley (1998) and Ashraf et al. (2010), the present study did not find a relationship between EE-Criticism and locus of control. However, the studies by Hooley and Ashraf did not control for illness variables, which may have confounded the relationship between EE-Criticism and locus of control. The finding from the present study is however in line with Bentsen et al. (1997) who found that after controlling for illness variables, internal locus of control was not associated with EE domains in caregivers of individuals with psychosis. It may be therefore that individuals who have an internal locus of control for their own behaviour do not necessarily apply these beliefs to others (Bentsen et al., 1997), similarly to how individuals can expect higher standards from themselves than they expect from others.

Expressed Emotion and interpersonal difficulties

A potentially novel finding in this study was that higher scores on a measure of interpersonal difficulty predicted higher scores on both EE domains. This might suggest that higher EE reflects an individual's generalised interpersonal difficulties, rather than just being a response to the caregiving role. Indeed, several items on the Inventory of Interpersonal Problems could conceivably correspond with items from the EOI domain on the Family Questionnaire, indicating overlap of the constructs. For example 'it's hard for me to be assertive with another person' ('assertive/ hard to be assertive subscale') or 'it's hard for me to attend to my own welfare when someone else is needy' ('caring/ too caring' subscale). Similarly, items such as 'it's hard for me to disagree with other people' ('assertive/ hard to be assertive subscale') and 'I get irritated or annoyed too easily' ('aggressive/ too aggressive' subscale) could correspond with the EE-criticism subscale.

It may be that individuals who have difficulties asserting their needs or who are overly caring for others may be more likely to express higher EOI towards significant others, whereas individuals who tend to disagree with others or who are more irritable with others generally might be more likely to be critical of their partner or relative. Further research is needed to identify whether particular subscales of the Inventory of Interpersonal Problems (IIP) account for the relationship between total scores on the IIP and EE domains, as the present study did not have enough power to explore this.

As with self-esteem, interpersonal functioning is thought to be related to attachment history, as individuals learn patterns of relating to others through internalising interactions with their primary attachment figures in infancy (Bowlby, 1973). Different types of interpersonal problems have been associated with different adult attachment styles (Berry et al., 2006). For example, dismissive attachment style (characterised by low anxiety and high avoidance) has been associated with interpersonal coldness and hostility, and preoccupied attachment (characterised by high anxiety and low avoidance) is associated with over-intrusive behaviour and dominance (Bartholomew & Horowitz, 1991). Both of these interpersonal styles map conceptually with EE-Criticism and EOI, thus it may be that similarly to self-criticism and EE, the relationship between scores on the Inventory of Interpersonal Problems and the Family Questionnaire is explained by attachment style.

The finding of a relationship between interpersonal difficulties and greater EE may reflect the fact that the sample is predominantly white British, a demographic group where both EOI and EE-Criticism has been shown to predict negative outcomes across a range of mental health difficulties, suggesting that it is an interpersonal stressor (Hooley, 2007). However, the impact of high EE differs cross-culturally. For example in psychosis research, EOI is associated with negative

outcomes in some cultures but not in others (Singh et al., 2013) and amongst African-Americans, having a low EE caregiver is associated with greater symptom severity (Gurak & Weisman De Mamani, 2017). Furthermore, high EE appears to have a positive impact on service users from particular client groups such as individuals at risk for developing psychosis (Izon et al., 2018) and individuals with a diagnosis of Borderline Personality Disorder (Hooley & Hoffman, 1999). These findings suggest that high EE will not always be perceived as stressful, and therefore cannot always be considered an interpersonal difficulty.

It is also possible that completing the Inventory of Interpersonal Problems after completing the Family Questionnaire may have influenced participants' responses such that they may have had their significant other in mind when completing this measure, which may have confounded the findings.

Expressed Emotion and The Big Five personality domains

The present study found that greater Openness predicted lower EE-Criticism, but not EOI. None of the other personality domains were found to predict EE. This supports the findings from a study of professional caregivers that found that participants who were rated as high EE scored lower on a measure of openness than colleagues who were rated as low in EE (Van Humbeeck et al., 2002). Research looking at personality and interpersonal communication has found that individuals who are more open tend to prefer direct (Jensen, 2016) and precise (Kottawatta, 2019) communication styles. Criticism within relationships might be considered a strategy to try and bring about change in the other. Support for this theory comes from McNab et al. (2007), who found that more critical caregivers were more likely to believe that being critical of their relative will help control their relatives symptoms. Therefore it may be that individuals who are more open are less likely to be critical of their significant others as their methods of communication may mean that any difficulties in the relationship are tackled head-on, thereby

mitigating the need to use criticism. A larger sample size would have allowed an investigation of whether any facet level personality domains predicted EE.

Study strengths and limitations

The cross-sectional nature of the study means that it is not possible to make inferences about causality. It may be that being in a high EE relationship leads to greater self-criticism and interpersonal difficulties, or alters people's beliefs about their locus of control. Furthermore, being self-critical, finding it hard to self-reassure, and having interpersonal difficulties could all be markers of someone experiencing a difficult life situation, which could be related to their relationship with their significant other, or to different stressors that were not controlled for in this study. It is likely that the relationships between EE and personality characteristics will be reciprocal and influenced by life circumstances such as financial stress or workplace conflict.

The fact that such a large proportion of the sample reported that they or their significant other had a past or present physical or mental health difficulty, or that they had a history of such difficulties themselves, suggests that the sample is unlikely to be purely non-clinical. However, given the prevalence of mental and physical health difficulties in the general population, this is not necessarily surprising. An important limitation of the study is that it did not identify whether the participant or their significant other had received treatment from a mental health service, which may have provided some insight into the severity of the mental health difficulties reported and an idea of how 'clinical' the sample was. However, the fact that just under three quarters of the sample did not identify as having taken a significant role in caring for their loved one suggests that the majority of the relationships assessed within this study were different to the caregiving relationships between relatives and service users in clinical studies. Additionally, participants were asked if their significant other had experienced a 'serious or long-term' physical health difficulty, but these stipulations were not applied to the mental health

questions, therefore some of the mental health difficulties reported might have been very mild.

On the other hand, 59% (n=46) of participants who reported that their significant other had experienced a mental health difficulty and 58% (n=26) of those who reported that their significant other had experienced a physical health difficulty said that they would consider themselves to have taken a significant role in caring for their partner/ relative during the time that they experienced these difficulties. This might suggest that the difficulties referred to in this sample were more severe. However, another limitation of the study is that we do not know the extent of the care that participants provided. The term 'caring' is quite vague, and supporting a significant other through a period of anxiety lasting a few months is likely to be different to supporting a significant other through many years of severe depression. Furthermore, the term could denote anything from providing more encouragement and affection to the significant other, to supporting them with activities of daily living.

The aim of the study was to statistically control for participants' physical and mental health in an attempt to gain an understanding of whether caregiver variables contribute to higher EE in the absence of physical and mental health difficulties. However, in doing so the study was unable to provide any information about the extent to which an individual's physical and mental health might affect the EE response. Given the high prevalence of physical and mental difficulties amongst caregivers (Schulz & Sherwood, 2008), including measures of participants' mental and physical health in the analyses as mediating or moderating variables, as opposed to controlling for them, may have provided more clinically useful information about how these factors interact with personality characteristics to affect EE in the caregiving population.

Another significant issue was the sampling method, which resulted in a largely homogeneous sample, with the majority of the participants being white

British highly educated females completing the EE measure in relation to their partners. Thus, the sample largely represents a Western, Educated, Industrialized, Rich, and Democratic (WEIRD) socio-cultural group and consequently this study cannot be considered a study of the general population. We know that the meaning of EE is different across cultures, and indeed in some cultures high EE appears to have a positive impact on service users (Gurak & Weisman De Mamani, 2017; Rosenfarb et al., 2006), suggesting that it can be an adaptive response rather than indicative of difficulties within that relationship. Therefore, the results of the present study may not be generalizable to individuals from different ethnicities or nationalities. Other constructs measured in this study were also developed in Western samples and may have different meanings across cultures. Furthermore, there is evidence to suggest that women tend to show greater EE than men (Rienecke & Richmond, 2017), so the relationships found in the present study between EE and psychological characteristics may not have been significant in an equally balanced gender sample. A more targeted approach to recruitment may have helped ensure a more diverse sample.

The fact that the sample is predominantly WEIRD is also problematic in terms of the extent to which the findings from this study may be clinically useful, given that service users accessing EI services are more likely to experience socio-economic deprivation (Public Health England, 2016), and rates of diagnosis of psychotic disorders are higher amongst people of black ethnicity compared to people of white ethnicity (Kirkbride et al., 2012). Therefore the present findings may not be applicable to the majority of caregivers of individuals accessing EI services.

The study did not have enough power to conduct analyses to investigate whether socio-demographic variables moderated the relationships between the predictor variables and EE. Furthermore, the large amount of variables explored meant that the study did not have enough power to explore possible mediating

relationships between predictor variables and EE. However, given that this is one of few studies to look at the relationship between personality characteristics and EE in a non-clinical population, the current findings may be considered preliminary analyses to identify which caregiver psychological characteristics warrant further investigation.

A major limitation of this study is that it did not include a measure of attachment. Doing so may have informed the current study's speculations regarding attachment driving the observed relationships between interpersonal functioning and EE and self-criticism and EE. Furthermore, it is very possible that some of the measures used had overlapping constructs, for example The Forms Of Self-Criticising/ Attacking & Self-Reassuring Scale and The Big Five Inventory (BFI) 2 – Short form. However, the fact that there was no evidence of colinearity in any of the regression models suggests that this may not have been such an issue. A strength of the study is that a power calculation was used to ensure that the study had a big enough sample to detect small effects between the variables that were investigated.

The use of self-report data may have introduced social desirability bias. It is possible that participants may have underscored, particularly on the Family Questionnaire, and perhaps particularly if answering questions about a significant other who is currently experiencing a physical or mental health difficulty. However, the fact that participants were told that their data would remain anonymous may have reduced the likelihood of this happening. The reliance on self-reflection for the Family Questionnaire may mean that the responses reported are not necessarily an accurate reflection of what happens within a relationship on a day-to-day basis. However, a recent study using experience sampling methodology found that EOI and EE-Criticism ratings on the FQ correspond with momentary criticism and EOI in caregivers, suggesting that the Family Questionnaire has ecological validity (Hinojosa-Marqués, Domínguez-Martínez, Kwapil, et al., 2019).

A final limitation of the study is that some of the assumptions for multiple linear regression were not met, which may limit the generalizability of the findings beyond this sample. Following discussion with a statistician, it was agreed that some of these violations, such as heteroscedasticity, might be unavoidable due to the number of binary variables in the models. Furthermore, linear regressions are robust to deviations from normality, and a lack of viable alternative non-parametric analysis methods meant that it was decided best to proceed with the parametric tests.

Scientific and clinical implications

To date, there have been few studies looking at psychological characteristics that are associated with EE, and even fewer looking at the predictors of EE in a non-clinical population. The present study found that after controlling for physical and mental health difficulties, the amount of criticism or EOI we express towards a significant other is influenced by our psychological characteristics, supporting the diathesis-stress model of EE (Hooley & Gotlib, 2000). The findings offer preliminary evidence that being more self-critical and having general interpersonal difficulties may predispose an individual to be more critical or report greater EOI towards their significant other, whilst being more able to reassure oneself may protect against this. Meanwhile, individuals who have a more open personality type may be less likely to express criticism, and having a more external locus of control may lead to expressing greater EOI.

In order to ascertain the reliability of the current findings, it would be important to replicate this research with a larger and more representative general population sample, with greater heterogeneity of ethnicities, cultural backgrounds, age groups and education levels. Studies would greatly benefit from including measures of additional life stressors that may impact on EE, to identify the extent to which social factors may be driving the EE response. Additionally, replicating this

study with general population samples from different cultural groups could also provide us with normative data about levels of EE across cultures, enabling us to anchor the current findings about EE and clinical outcomes within cultural norms.

Longitudinal studies of non-clinical samples from different cultural groups are needed to investigate whether the characteristics highlighted in this study contribute to the development of EE over time, and to provide insights into the function of EE across cultures. In turn, this could provide avenues for culturally sensitive interventions that aim to promote healthy forms of emotional expression within relationships, reducing chances of unhelpful communication patterns from developing and thereby improving clinical outcomes for individuals with physical and mental health difficulties. Furthermore, longitudinal research could help us to understand more about what psychological characteristics predict healthy forms of communicating and expressing emotions.

It is important to acknowledge that the current understanding of EE as a construct is in relation to caregiving relationships, as highlighted by the low number of participants meeting threshold for high EE whose significant others did not have a past or present physical or mental health difficulty. It is possible that high EE in relationships where the significant other is physically and mentally well may be less likely to have a negative impact. The relationship may be more equal, and the individual may be able to be more independent and utilise multiple coping resources, all of which may regulate the impact of high EE on the significant other. In caregiving relationships on the other hand, the individual may be less able to seek other sources of support and the relationship may be less equal, resulting in high EE having a more negative impact. Given that EE is dyadic, future research in non-clinical samples could therefore recruit dyads and collect measures from both individuals, including measures of the perception of EE, as has been done in clinical populations (Bastug & Karanci, 2015; Tsai et al., 2015). Future research could also

look at the extent to which physical and mental health difficulties in the caregiver and/ or their significant other impact on the EE response and on the relationships between EE and the caregiver psychological factors investigated in this study. For example, continuous measures of physical and mental health could be used that assess the severity and distress caused by the difficulty.

Given that self-esteem and interpersonal functioning are linked to attachment, it will be of interest for future studies to investigate possible relationships between these factors and EE. Clinically, the findings can be used in interventions to help service users and caregivers understand more about the factors that may be playing a role in the caregivers' level of EE. The findings also suggest that it is likely to be particularly helpful to assess caregiver's self-criticism and general interpersonal experiences, as well as their locus of control, and offer caregivers additional interventions targeted at these areas if needed. Furthermore, the findings suggest that interventions for high EE caregivers should include strategies that help caregivers be more self-compassionate, and that clinicians working with more critical caregivers should promote curiosity in the caregiver.

Conclusions

The present study found that even after controlling for the presence of physical and mental health difficulties within significant relationships, individuals who are more critical of their significant others tend to be more critical of themselves, have more interpersonal difficulties and be less open, whilst individuals who have greater EOI also tend to be more self-critical and have more interpersonal difficulties, as well as a greater external locus of control. Furthermore, it found that individuals who are more able to reassure themselves may be less likely to express high EE.

These findings can inform assessments of caregivers needs in clinical services, and allow for more tailored interventions. They also provide tentative

hypotheses for psychological characteristics that may be involved in the development of high EE by predisposing an individual to express more criticism or EOI when caring for an unwell loved one. However, the findings must be interpreted with caution considering the high proportion of well-educated white females in the sample, and the fact that life stressors were not controlled for. Further research into the development of EE over time can help us to understand more about the role of these personality characteristics in EE.

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Part 3: Critical Appraisal

Introduction

This appraisal will critically consider issues related to the construct and measurement of Expressed Emotion (EE) and the dilemmas these raised in my research. It will then consider practical and methodological issues that I encountered. Throughout, the appraisal will consider how things might have been done differently and ideas for future research.

Construct of Expressed Emotion

Expressed emotion (EE) has been studied extensively due to its association with relapse and clinical outcomes in mental and physical health disorders. It has influenced service delivery for individuals experiencing First Episode Psychosis (Birchwood et al., 1998; Smith & Birchwood, 1990), informed interventions (Kuipers et al., 2002; Magliano & Fiorillo, 2007; McCann et al., 2015), and increased our understanding of how family and relational contexts can affect the wellbeing of individuals with mental health difficulties. However, there are some issues around how the construct is measured and defined, and the potential impact it can have on how caregivers are perceived (Falloon, 2003).

Measurement of Expressed Emotion

The EE construct includes five domains: criticism, emotional-over involvement (EOI), hostility, warmth, and positive remarks. EE was originally measured using the Camberwell Family Interview (CFI) (Vaughn & Leff, 1976), which is still considered the 'gold standard' measure of EE (Cherry et al., 2018). However, because the CFI is lengthy and requires training to administer, various shorter measures of EE have been developed, most of which are self-report and tend to focus on the criticism and EOI domains (Hooley & Teasdale, 1989; Kavanagh et al., 1997; Kreisman et al., 1979; Magaña et al., 1986; Wiedemann et

al., 2002). There is a growing body of research indicating that the presence of warmth can reduce relapse and improve clinical outcomes even in high EE families (Bertrando et al., 1992; Butler et al., 2019). However, to the best of my knowledge, there is no self-report measure of EE for caregivers that assesses warmth and positive remarks. When self-reported warmth has been assessed in research with caregivers, the measures used have not been validated against the CFI (Schlosser et al., 2010; Spruytte et al., 2002), which Hooley and Parker (2006) argue is necessary for a measure to be considered a valid assessment of EE.

For studies where it is not feasible to use interview measures of EE, the lack of available and validated self-report measures of warmth and positive remarks may be biasing researchers towards focusing on EOI and EE-Criticism domains, which in turn may be impacting on research questions and findings. This is notable in Chapter One, where 12 out of 14 of the included studies used self-report measures of EE, and only one study looked at warmth and positive remarks in relation to caregiver psychological factors (using the CFI). The issue of how EE is measured was also pertinent to the research design of my thesis for two reasons. Firstly, since much of the existing literature on relationships between EE and caregiver variables uses self-report measures of EE, scoping searches conducted to identify search terms for the systematic review inherently biased the review towards looking at psychological factors that might be construed as more negative, such as mental health difficulties and self-criticism, which have been studied in relation to EOI and EE-Criticism. Although search terms such as adaptability, acceptance, and flexibility were included, overall there was an imbalance towards more problem-focused psychological variables. The selection of personality characteristics to study in the empirical paper is also likely to have been affected in the same way.

Secondly, the decision to use the Family Questionnaire to assess EE for the empirical paper was largely driven by pragmatic reasons; as it was an on-line study

a self-report measure was necessary, and the FQ has good concurrent validity with the CFI (Wiedemann et al., 2002). However, had there been a validated self-report measure available that included an assessment of warmth and positive remarks I would have chosen that instead. It is interesting to think how this thesis may then have differed in terms of the constructs reviewed and measured and the findings generated. However, the present research has identified that studies are needed to identify the psychological correlates of warmth and positive remarks in caregivers, and that such work is likely to necessitate the creation of a relevant self-report measure.

Definition of Expressed Emotion domains

Another issue raised by the EE construct is related to how the domains are defined. There has been particular controversy around the EOI domain as it is less consistently related to relapse and negative service user outcomes, putting into question whether high EOI should be considered problematic (Koutra et al., 2015). Furthermore, some research has shown that EOI may have a positive impact on individuals with a diagnosis of Borderline Personality Disorder, and adolescents at 'imminent risk' of conversion to psychosis (Hooley & Hoffman, 1999; O'Brien et al., 2006; Schlosser et al., 2010). EOI is defined as behaviour from caregivers that is intrusive, overprotective, and excessively self-sacrificing, or having an exaggerated emotional response to the service user's illness (Singh et al., 2013). Some researchers have argued that aggregating these different facets together is unhelpful, as it prevents an understanding of how they may differentially impact on both the caregiver and service user, and that what is classified as EOI should be considered in terms of what is appropriate or inappropriate for that particular care recipient (Fredman et al., 2008).

Again, to the best of my knowledge, there are no EE measures that distinguish between the different facets of EOI. Some caregivers might only

demonstrate self-sacrifice and over-protectiveness, which might be associated with being motivated by a sense of duty, and therefore these aspects of EOI could provide the caregiver with a feeling of purpose. On the other hand, carers who's high EOI score is specific to having an 'exaggerated emotional response' could experience more distress. As discussed elsewhere in the thesis, the way that the EE response is experienced by the recipient is also important in determining whether or not EE is indeed 'high' or 'low' (Bastug & Karanci, 2015; Tsai et al., 2015). For example, what feels intrusive to one individual may not feel intrusive to another. Further research is needed to explore whether the different facets of EOI have different psychological correlates in caregivers, and whether some aspects of EOI are perceived as helpful by service users.

Culture and Expressed Emotion

What is deemed an appropriate or inappropriate level of criticism or EOI is going to be largely dictated by cultural norms (O'Driscoll et al., 2019). There is research to suggest that in some cultures high EE does not predict relapse and indeed may help prevent it (Gurak & Weisman De Mamani, 2017; Rosenfarb et al., 2006; Singh et al., 2013). Particular consideration has been given to how caregiver behaviour that is rated as high EOI in one culture may not be considered high EOI in another culture due to cultural values around self-sacrifice (Singh et al., 2013). This in turn is likely to affect how self-sacrificing behaviours are experienced by the service-user. However, Singh et al. (2013) note that "EOI is ultimately about the transgression of interpersonal boundaries, the balance between proximity and autonomy, even in cultures with a collectivistic sense of self, there must be an interpersonal boundary" (p. 460). In line with this, a systematic review of cross-cultural research by O'Driscoll et al. (2019) found that when studies adjusted the thresholds for high EE based on cultural norms, associations between EE and relapse were found across cultures. This suggests that the EE construct has cross-

cultural relevance, but that it's application needs to come hand in hand with an understanding of cultural norms for EE.

There is also evidence to suggest that warmth is a more significant predictor of relapse than criticism or EOI amongst American Latinos and Mexican Americans (Lopez et al., 2004; Tsai et al., 2015), suggesting that interventions for caregivers from these groups may be more helpful if they are focused on fostering warmth than if they are focused on reducing high EE.

One intention of the systematic review was to consider whether there was cultural variation in the relationships between EE and caregiver psychological factors. Quite a lot of time was spent thinking about the best approach to take to this, as it was recognized that culture is made up of multiple factors, all of which might have a greater or lesser impact on our thinking, behavior, and how we respond to our significant others, depending on the context. Furthermore, cultures that may appear similar to an outsider may actually have very different beliefs about caregiving and mental illness. For example Hashemi and Cochrane (1999) found that British Pakistani Muslims and British Indian Sikhs responded very differently to having a relative with a mental illness. It was also not known how studies would have reported socio-demographic information related to participants cultural backgrounds or looked at the role of culture in their analyses, or whether differences in findings between studies might have been explained by cultural differences between the countries that studies were conducted in.

Given this, it was decided to adopt an exploratory approach and use a broad definition of culture. This involved extracting all data relating to the cultural background of participants from the studies, such as ethnicity and whether or not the participants were immigrants. It was found that most studies did not report this information. This is surprising given that greater attention is being paid to cultural differences in EE and caregiving in general (Onwumere & Kuipers, 2017; Tsai et al.,

2015). It is possible that in studies where the participants were all from the majority cultural group of the country that the research was conducted in that the authors did not think to report this. However, the lack of inclusion of this information made it difficult to consider if cultural differences existed between participants in the same study or between different study populations. Information regarding participants' ethnicity, nationality, or migration status should be reported as standard in research, so that potential differences between cultures can be explored. This would also allow us to monitor who is being included and who is being excluded from psychological research.

One of the hopes for the empirical paper is that it could provide normative data about EE and the psychological characteristics that it relates to by using a non-clinical sample. However, the choice of using convenience sampling meant that participants were predominantly White British, and consequently it was not possible to look at whether ethnicity or nationality contributed to EE scores. Furthermore, because the sample was predominantly made up of highly educated females, it cannot really be considered a general population sample that gives us an idea about norms for EE amongst the white British population either.

Although the use of a convenience sampling method is likely to have helped me exceed my recruitment target of 220 participants, in future I would consider how I could target recruitment so that I reach people from a more representative sample of cultural backgrounds. For example, in addition to the study advertisement I used, I could also have made additional recruitment advertisements aimed at different ethnic groups, for example black-African, black-Caribbean, south Asian, east Asian etc., and explained on the advertisements that I hoped to recruit a diverse sample so that the experiences of different ethnic groups are represented. These posters could then have been posted on social media platforms and I could have asked that they be shared amongst people's relevant contacts. I could then have regularly

monitored the demographics of the recruited participants, to see whether I needed to put more effort into reaching people from a particular ethnic background.

Alternatively, I could have focused on particular cultural or ethnic groups to obtain normative data. However, these approaches are not without their problems, as there is likely to be considerable variation between seemingly culturally homogenous groups.

Expressed Emotion and the perception of caregivers

The construct of EE has helped shift the focus from individuals and their difficulties to include a consideration of how a person's context can impact on their wellbeing. However, there is a risk of pathologising an understandable response to coping with what can often be extremely difficult circumstances. On reflection, I have concerns that my empirical paper might inadvertently contribute to a narrative of blaming caregivers by looking at how their personality characteristics relate to EE without consideration of the important role of dyadic reciprocity between participants and their significant others, attachment, or the presence of life stressors (Möller-Leimkühler & Obermeier, 2008). Few studies that I came across considered the role of life stressors in EE either. It is therefore important that the findings from the empirical study are replicated in research with dyads that include measures of stressful life events, as well as measures of attachment style.

I had considered including a measure of socio-economic status in the demographic questionnaire of the empirical paper, hypothesising that individuals from a lower socio-economic status might experience more stress and therefore report higher EE. However, as the study was particularly advertised around student populations it was difficult to work out how to assess socio-economic status, as students themselves may earn little, and they may not be aware of their parent's salary. Being in higher education might in itself indicate that an individual is from a

higher socio-economic status due to the social inequalities in access to higher education.

On the other hand, I hope that studying EE within a non-clinical sample might go some way towards demonstrating how criticism and EOI are likely to be part of all close relationships to some degree. Similarly to the diathesis-stress model of EE (Hooley & Gotlib, 2000), I find it helpful to think about how we are all on a continuum of EE, and that given enough stress (from the caregiving role or from other life stressors) we could all express high EE towards a significant other. Furthermore, a better understanding of what drives high EE can contribute to more targeted interventions not only for caregivers and family members, but also for service users, to help them better understand the reasons why their family member is expressing emotion in a particular way towards them. The finding from the empirical paper that EE-Criticism was associated with self-criticism and reduced ability to self-reassure might be particularly helpful for fostering a more compassionate understanding of this type of caregiving response amongst clinicians and services. In future research I would consult with caregivers from an 'experts by experience' group to get their feedback about the study.

Methodology

Recruitment criteria

Deciding how to define the target population for the empirical paper was difficult as there have been few studies of EE in non-clinical populations. I was attempting to mirror the caregiving relationships found in clinical research as closely as possible by thinking about what the relationships between service users and caregivers might have looked like, objectively speaking, prior to the service user becoming unwell. Research looking at EE in caregivers of individuals with psychosis has tended to specify an amount of contact time between the caregiver and service

user, although as noted in Chapter 1 there is great variation in the minimum amount of contact time stipulated. This was not necessarily applicable to a non-clinical population, as presumably the amount of contact between caregivers and service users increases when someone is unwell or going through a crisis. Keeping in mind that amount of contact time is thought to be a significant driver of high EE (Brown et al., 1972), I decided to specify that the participant needed to be living with the significant other, as I was concerned that if the participant and the significant other were living apart then scores on the EE measure may have been too low to find any effects. However, it is acknowledged that individuals may live far apart from their significant other, but still take on a caregiving role for them if they become unwell.

My intention behind stipulating that the significant other needed to be someone who the participant would play a significant role in caring for if they were to become unwell was again to make sure that I was approximating the caregiving relationships found in clinical research as closely as possible, to allow for better comparison. However, adding this stipulation may have biased the sample by attracting prospective participants who related to having cared for their significant other. The fact that the majority of participants (42%) reported that their significant other had a past or present physical or mental health difficulty supports this theory, although a lower proportion (26%) reported identifying as having taken a significant role in caring for their relative. Although I do not know whether any of the significant others were involved with mental health services, in hindsight omitting this criterion may have reduced the likelihood of this number being high.

Study design

The cross-sectional nature of the study meant that conclusions could not be drawn about the direction of the effects between EE and the caregiver psychological factors. Such conclusions could only be reached through the use of longitudinal studies spanning many years, which are unfortunately likely to be unrealistic.

However, it might have been interesting to ask participants to repeat the measures again at a later time point, as this would provide some information about the stability of EE and personality characteristics and give the results greater reliability.

When designing the demographic questionnaire I had wanted to be as inclusive as possible, particularly holding in mind people from minority groups. I referred to a recent National census rehearsal survey to help me consider question phrasing and multiple-choice responses. I have also noticed a growing shift in surveys to let people self-define aspects of their identity rather than providing prescribed options that may not feel applicable to everyone. With this in mind, I wanted to let people define their nationality identity, my rationale being that some people have multiple national identities. Consequently, this made quantitative analysis of the data more difficult and ultimately many of the responses were combined anyway, for example English and British.

I had also attempted to include a question that captured whether or not a person was an immigrant. This was slightly complicated by the fact that as it was an online survey, the questionnaire was not just open to people living in the United Kingdom. Therefore, I asked what country the participant was currently living in and what year they had arrived to live in that country, but regrettably I did not think to include an option for people to say that they were born in the country that they live. This meant that the data for this question was unfortunately unusable, as it was not possible to tell whether participants were selecting the year that they arrived to the country they live in, or if they were born there, they may have been selecting the year that they were born. In future research I would pilot the demographic questionnaire first to sense-check it, and get feedback on its acceptability to the respondent in terms of how inclusive it feels.

A strength of the thesis is that I got a pilot group to complete the EE and personality characteristic measures, to get an idea of how long they would take

people to complete and also their acceptability. This proved helpful as I received the feedback that the self-criticism measure had felt particularly emotive to complete. This resulted in me ensuring that information regarding mental health self-care and support services were provided in both the participant information sheet and in the study debrief.

Conclusions

This thesis is likely to have benefitted from the inclusion of measures of warmth and positive remarks, had these been available. This would help to increase our understanding of what factors might protect caregivers from expressing high EE when caring for an unwell relative. It would also encourage a more strengths-based perspective of the caregiving role. The field of EE research will benefit from the development of self-report measures capturing warmth and positive remarks, as well as measures that distinguish between the different facets of EOI. Reflecting on the limitations in the recruitment process and study design have been an invaluable learning exercise.

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Appendices

Appendix 1: Quality appraisal scores for studies

Y = Yes: Criteria fully met

P = Partially: criteria partially met

N = No: Criteria not met

N/A = criteria not applicable to the study

	1	2	3	4	5	6	7	8	9	10	11	12	13	14						
	Question / objective sufficiently described?	Study design evident and appropriate?	Method of subject/comparison group selection or source of information/input variables described and appropriate?	Subject (and comparison group, if applicable) characteristics sufficiently described?	If interventional and random allocation was possible, was it described?	If interventional and blinding of investigators was possible, was it reported?	If interventional and blinding of subjects was possible, was it reported?	Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?	Sample size appropriate?	Analytic methods described/justified and appropriate?	Some estimate of variance is reported for the main results?	Controlled for confounding?	Results reported in sufficient detail?	Conclusions supported by the results?	Total number of Yes	Total number of partials	Total number of No	Total number of N/A	Total number of N/A	Score
Alvarez-Jiminez et al. (2010)	Y	Y	Y	P	N/A	N/A	N/A	Y	P	Y	Y	P	Y	Y	8	3	0	3	0.86	
Brent et al. (2011)	Y	Y	P	P	N/A	N/A	N/A	Y	P	Y	Y	P	Y	Y	6	5	0	3	0.77	
Cotton et al. (2013)	Y	Y	Y	Y	N/A	N/A	N/A	Y	P	Y	Y	P	Y	Y	9	2	0	3	0.91	
Gonzalez-Blanch et al. (2010)	Y	Y	Y	P	N/A	N/A	N/A	Y	P	Y	Y	N	Y	Y	7	3	1	3	0.77	
Hamaie et al. (2016)	Y	Y	Y	P	N/A	N/A	N/A	Y	P	Y	Y	Y	Y	Y	8	3	0	3	0.86	
Hinrichsen and Lieberman (1999)	P	Y	Y	Y	N/A	N/A	N/A	Y	P	Y	Y	Y	Y	Y	9	2	0	3	0.91	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14						Score
	Question / objective sufficiently described?	Study design evident and appropriate?	Method of subject/comparison group selection or source of information/input variables described and appropriate?	Subject (and comparison group, if applicable) characteristics sufficiently described?	If interventional and random allocation was possible, was it described?	If interventional and blinding of investigators was possible, was it reported?	If interventional and blinding of subjects was possible, was it reported?	Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?	Sample size appropriate?	Analytic methods described/justified and appropriate?	Some estimate of variance is reported for the main results?	Controlled for confounding?	Results reported in sufficient detail?	Conclusions supported by the results?	Total number of Yes	Total number of partials	Total number of No	Total number of N/A		
Jansen, Haahr et al. (2015)	Y	Y	Y	P	N/A	N/A	N/A	Y	P	Y	Y	Y	Y	Y	9	2	0	3	0.91	
Jansen, Harder, et al. (2015)	Y	Y	Y	P	N/A	N/A	N/A	Y	P	Y	Y	N	Y	Y	8	2	1	3	0.82	
Jansen et al. (2014)	Y	Y	Y	P	N/A	N/A	N/A	Y	P	Y	Y	N	Y	Y	8	2	1	3	0.82	
McNab et al. (2007)	Y	Y	Y	P	N/A	N/A	N/A	Y	P	P	Y	Y	Y	Y	8	3	0	3	0.86	
Patterson et al. (2005)	Y	Y	Y	P	N/A	N/A	N/A	Y	P	P	Y	P	Y	Y	7	4	0	3	0.82	
Tomlinson et al. (2014)	Y	Y	Y	Y	N/A	N/A	N/A	Y	P	Y	Y	P	Y	Y	9	2	0	3	0.91	
Vasconcelos et al. (2013)	Y	Y	Y	Y	N/A	N/A	N/A	Y	P	Y	Y	Y	Y	Y	10	1	0	3	0.95	
Zanetti et al. (2018)	Y	Y	Y	P	N/A	N/A	N/A	Y	P	Y	Y	P	Y	Y	7	4	0	3	0.82	
TOTAL	Y:13 P: 1	Y: 14	Y: 13 P: 1	Y: 4 P: 10	N/A: 14	N/A: 14	N/A: 14	Y: 14	P:14	Y: 12 P: 2	Y: 14	Y: 5 P: 6 N: 3	Y: 14	Y: 14						

Appendix 2: Sample email to participants

Dear students,

I'm looking for volunteers to take part in my online research study that I am conducting as part of my Doctorate in Clinical Psychology training. The study will explore what individual factors influence the way that we communicate and express emotion in our close relationships.

I am looking for volunteers who:

- Are aged 18 or over
- Able to read English
- Are living with a partner or relative
- The partner/ relative is someone who they would play a significant role in caring for, **if** the partner or relative were to become unwell

You would be asked to complete some questionnaires that will take around 15 minutes to do. To thank you for your time, you can be entered into a prize draw for an opportunity to win one of five £50 Amazon vouchers.

If you think you might be interested, or if you want to find out more, you can do so by following this link: <https://tinyurl.com/s5dwooo>

Many thanks for your time and interest so far!

Nancy Neath
Third Year Trainee Clinical Psychologist
Doctorate in Clinical Psychology Training Program
University College London

Appendix 3: Participant information sheet

Participant Information Sheet

UCL Research Ethics Committee Approval ID Number: 15737/001

Title of Study: What individual characteristics influence the way that we communicate and express emotion in our close relationships?

Department: Research Department of Clinical, Educational and Health Psychology

Name and Contact Details of the Researcher:

Nancy Neath
Trainee Clinical Psychologist
nancy.neath.14@ucl.ac.uk
Research Department of Clinical, Educational and Health Psychology
University College London
1-19 Torrington Place
London WC1E 7HB

Name and Contact Details of the Principal Researcher:

Dr Madiha Shaikh
Clinical Psychology Lecturer
madiha.shaikh@ucl.ac.uk
Telephone: [020 7679 8230](tel:02076798230)
Research Department of Clinical, Educational and Health Psychology
University College London
1-19 Torrington Place
London WC1E 7HB

You are being invited to take part in a research project. Before you decide whether or not you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please contact us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Whether you decide to take part or not is completely up to you and choosing not to take part will not disadvantage you in any way.

What is the project's purpose?

Our aim is to better understand factors that influence our relationships with our significant others, such as our partners or relatives. Previous research with patients with physical and mental health difficulties has shown that the way that their close relatives communicate and interact with them impacts on their clinical outcomes and relapse rates. Whilst lots of research has studied the relationships between patients and their relatives, less is known about what factors might influence the way that the general population communicates and interacts with their loved ones. We would like to know whether certain individual characteristics, such as aspects of our personality, might influence these relationships.

Who can participate in the study?

Inclusion criteria: We are inviting anyone aged 18 and over to take part in the study. As unfortunately the measures that we will be using in the study are not available in

different languages, volunteers must be able to read English and have sufficient IT skills to be able to navigate the online survey system.

Volunteers will also need to have a 'significant other' person that they can keep in mind when answering one of the questionnaires included in the study. The 'significant other' person would need to fulfil the following criteria:

- a.) Be someone who the volunteer lives with
- b.) Be a partner or relative of the volunteer
- c.) If this person was to become physically or mentally unwell, the volunteer would take a significant role in caring for them

Exclusion criteria: Individuals under the age of 18, those unable to read English, or those who do not have a 'significant other' person who meets the above criteria.

What is involved if I take part?

Participant in the study will involve completing a series of questionnaires. One of these questionnaires will be asking you about your relationship with a 'significant other' person, and the other questionnaires will be looking at some of your individual characteristics, such as aspects of personality and self-esteem, and asking about your relationships with people in general. We will also ask about your age, ethnicity, which country you live in and how long you have lived there for, your nationality, gender, education, and employment status. This is because research has shown that the way we communicate and express emotion towards our loved ones can differ depending on our socio-demographics. As previous research has studied patients with physical or mental health difficulties and their carers, we will also ask whether you or your significant other has any past or present physical or mental health difficulties, and whether you have ever taken a significant role in caring for your significant other whilst they have been physically or mentally unwell.

We anticipate that it will take you between 10 and 20 minutes to complete these questionnaires. Your data will not be recorded and saved until you click the 'next' button at the bottom of each page. Submission of your completed survey data will imply that you have consented for us to use your data in our study.

If for whatever reason you are unable to complete the study all in one sitting, or if you accidentally close the study browser, your data that you have submitted up until that point will be saved. You will then have a two-week window during which you can return to complete the study, if you wish to. In order to access the study from where you left off you would need to access the link from the same device and using the same browser that you used when you began the study (e.g. from your laptop, using Google Chrome). If for whatever reason you do not return to complete the study, your incomplete data may be used in our analysis, to avoid your efforts being wasted.

What are the possible disadvantages and risks of taking part in this study?

We do not expect that participation in this study will cause any harm. However, some people might find completing some of the questionnaires upsetting. One of the questionnaires asks you to think about your relationship with a significant other, and it is possible that reflecting on this relationship might cause some distress. Another questionnaire will ask about self-criticism, and so it is also possible that completing this questionnaire might cause you some distress.

If you do feel distressed at any point whilst completing the study, you might find one of the following relaxation exercises on this website helpful

<https://www.getselfhelp.co.uk/relax.htm>. You are also welcome to contact the researchers using the above contact information, and we can signpost you to helpful resources and support services.

If you feel that you might benefit from some on going support, you might find it helpful to contact one of the following services:

- The Samaritans (Phone: 116 123/ Website: <https://www.samaritans.org/how-we-can-help/contact-samaritan/>). Support service for people experiencing distress.
- Improving Access to Psychological Therapies (IAPT; [https://www.nhs.uk/Service-Search/Psychological%20therapies%20\(IAPT\)/LocationSearch/10008](https://www.nhs.uk/Service-Search/Psychological%20therapies%20(IAPT)/LocationSearch/10008)) . Provide evidence based psychological therapies to people with anxiety and depression.
- <https://carers.org/> - Offer support to carers of people with physical or mental health difficulties.

What are the benefits to me for taking part?

Whilst there are no direct benefits to you for taking part, you will leave with the knowledge that you have contributed to our understanding of whether certain factors affect the way that we communicate and express emotion towards our loved ones. It is hoped that this information may help future researchers to get a better understanding of what influences the way that we interact with and respond to our relatives when they are physically or mentally unwell. It may also help future researchers to develop and refine psychological interventions for people with physical or mental health difficulties. We aim to publish this work.

Will I receive compensation for giving my time?

If you choose to take part, as a way of thanking you for your time you have the option to be entered into a prize draw to win one of five £50 Amazon vouchers.

Will my taking part be kept confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential. Your age will be collected as a broad category, so that it will not be possible to identify you from the data. We will be collecting your data via Qualtrics, a heavily encrypted, GDPR compliant cloud-based platform for creating research surveys.

If you would like to be entered into the prize draw with a chance to win one of five £50 Amazon vouchers, and/ or if you would like us to contact you with a summary of the results of the study, then we will ask you to provide your name and contact details (email address and/ or phone number). This information would only be used to let you know if you have won the prize draw, or to let you hear about the results of the study. It would not be used for any other purpose.

If you do provide your name and contact details, they will remain linked with your study data on Qualtrics whilst we complete data collection.

Your data will be downloaded from Qualtrics and stored on password-protected files on password-protected computers on the secure UCL network. If you have provided us with your name and contact details (for the purposes of being entered into the prize draw or for being contacted with the results of the study), your data will be pseudoanonymised. This means that we will label your data with a participant ID number, and your name and contact details will be removed from the data and stored along with your ID number in a password protected file separately from the rest of your study data. Therefore it will not be possible to identify you from your study data alone without accessing it within Qualtrics. If you have not provided us with your name or contact details, then your data will remain completely anonymous.

Once we have finished data collection, your data will be securely deleted from Qualtrics. If you have provided us with your name and contact details, your pseudo-

anonymised data will continue to be stored on the UCL network until the study is complete. Once the study is complete, all names and contact details provided will be confidentially deleted from the UCL network, and only an anonymised copy of the data you provided will be retained.

It will not be possible to identify you from any ensuing reports or publications.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you can download this information sheet to keep, and you will be asked to read a consent form. If you are happy with all of the items on the consent form we will ask you to tick a box to say that you have read and understood all of the items on the form and that you agree to take part in the study, and that you understand what your participation involves.

Whilst completing the study you can withdraw at any time without giving a reason and without it affecting any benefits that you are entitled to. If you have provided us with your name and contact details (for the purposes of being entered into the prize draw or for being contacted with the results of the study) and you decide that you want to withdraw your data, you can do so by contacting one of the researchers using the contact details found at the top of this information sheet. Withdrawing your data will not involve any penalty or loss of benefits that you are otherwise entitled to. For practical reasons, we will only be able to withdraw your data from the study up to two weeks after the date that you last participated, as after this point the data will be incorporated into the overall study analysis. However, we will still be able to delete your name and contact details if these have not already been deleted (which will render your data fully anonymous). If you have not provided us with your name and contact details it will not be possible for us to delete your data once it has been submitted, as your data will be completely anonymous.

What should I do if there is a problem?

If you wish to make a complaint or if you have any concerns about any aspect of study or the way that it has been advertised then the UCL complaints procedures are available to you. In the first instance you can contact the principal researcher, Dr Madiha Shaikh (see contact details above). However, should you feel that your complaint has not been handled to your satisfaction, you can contact the Chair of the UCL Research Ethics Committee – ethics@ucl.ac.uk

What will happen to the results of the research study?

The results of this study will be published as part of a Doctoral research project at UCL. The results may also be published in academic journals and presented at conferences. There will be no way of identifying you in any reports or publications that result from this study. Upon completion of the study, a summary of the results of the study will be sent to you, should you wish to receive it.

The data collected during the course of the project might be made openly available and used for additional or subsequent research. This data will be fully anonymised and it will not be possible to identify you from this data. If you have provided us with your name and contact details (email address and/ or telephone number) these will have been securely deleted.

Who is organising and funding the research?

The study is being funded by the UCL Doctorate in Clinical Psychology Departmental funding.

Local Data Protection Privacy Notice

The data controller for this project will be University College London (UCL). The UCL Data Protection Officer provides oversight of UCL activities involving the processing of personal data, and can be contacted at data-protection@ucl.ac.uk. This 'local' privacy notice sets out the information that applies to this particular study. Further information on how UCL uses participant information can be found in our 'general' privacy notice: https://www.ucl.ac.uk/legal-services/sites/legal-services/files/ucl_general_research_participant_privacy_notice_v1.pdf The information that is required to be provided to participants under data protection legislation (GDPR and DPA 2018) is provided across both the 'local' and 'general' privacy notices.

The categories of personal data used will be as follows: name, email address, telephone number.

The lawful basis that would be used to process your *personal data* will be performance of a task in the public interest.

The lawful basis used to process *special category personal data* (such as your ethnic origin and whether you have a past or present physical or mental health difficulty), will be for scientific and historical research or statistical purposes.

Your personal data will be processed until the study is complete. If we are able to anonymise or pseudonymise the personal data you provide we will undertake this, and will endeavour to minimise the processing of personal data wherever possible. If you are concerned about how your personal data is being processed, or if you would like to contact us about your rights, please contact UCL in the first instance at data-protection@ucl.ac.uk.

Who can I contact for further information?

The study is being conducted by researchers from the Department of Clinical, Educational and Health Psychology at University College London. If you have any further questions about this study before or after your participation, please feel free to contact us and we will be happy to answer any questions that you might have:

Nancy Neath, Trainee Clinical Psychologist Email: nancy.neath.14@ucl.ac.uk
Dr Madiha Shaikh, Clinical Psychology Lecturer Tel: [020 7679 8230](tel:02076798230) Email: madiha.shaikh@ucl.ac.uk

Thank you for reading this information sheet and for considering taking part in this research study. Please feel free to download a copy to keep for your records.

Appendix 4: Consent form

CONSENT FORM

Please read this form after you have read the Information Sheet.

Title of Study: What individual characteristics influence the way that we communicate and express emotion in our close relationships?

Department: Clinical, Educational and Health Psychology

Name and Contact Details of the Researcher: Nancy Neath
nancy.neath.14@ucl.ac.uk

Name and Contact Details of the Principal Researcher: Dr Madiha Shaikh
madiha.shaikh@ucl.ac.uk / 020 7679 8230

Name and Contact Details of the UCL Data Protection Officer: Lee Shailer data-protection@ucl.ac.uk

This study has been approved by the UCL Research Ethics Committee:
Project ID number: 15737/001

I confirm that I understand that by ticking the “I agree to all items on the consent form and wish to continue to the study” button below, I am consenting to ALL of the items on the consent form. If I do not consent to all of the elements of the study outlined below, I should not click on the “I agree” button to begin the study:

1.	I confirm that I have read and understood the Information Sheet for the above study. I have had an opportunity to consider the information and what will be expected of me. I have also had the opportunity to ask questions which have been answered to my satisfaction
2.	I consent to participate in the study. I understand that any personal information that I provide (name, email address and/ or telephone number, gender, age bracket, country I live in, length of time that I have lived in that country, nationality, ethnicity, employment status, level of education, whether or not I have a past or current physical or mental health difficulty and whether I consider myself to be a carer for someone with physical or mental health difficulties) will be used for the purposes explained to me. I understand that according to data protection legislation, ‘public task’ and ‘scientific and historical research or statistical purposes’ will be the lawful basis for processing.
3.	Use of the information for this project only I understand that during the study, all personal information will remain confidential and that all efforts will be made to ensure I cannot be identified. My data will be stored securely, and it will not be possible to identify me in any publications. I understand that if I choose to provide my name and contact details (for the purposes of being entered into the prize draw and/ or being contacted about the results of the study) then my study data will be stored pseudo-anonymously initially. Once my name and contact details are no longer needed, they will be securely deleted and my data will become fully anonymised. I understand that my data (including my name and email address and/ or telephone number, if provided) will be stored securely on Qualtrics (a GDPR compliant, encrypted, cloud based survey platform) up until the point that data collection is complete. After this point, my data will be securely deleted from Qualtrics,

	<p>and downloaded and stored securely onto the UCL network.</p> <p>I understand that if I have not provided my name and contact details then my data will be stored anonymously throughout the study.</p>
4.	I understand that my information may be subject to review by responsible individuals from the University for monitoring and audit purposes.
5.	<p>I understand that my participation is voluntary and that I am free to withdraw my participation at any time without giving a reason. I understand that any data that I have provided up to that point may be included in the study analysis.</p> <p>I understand that if I have provided my name and contact details, and if I decide that I want to withdraw my data, I can do so by contacting one of the researchers. I understand that withdrawing my data will not involve any penalty or loss of benefits that I am otherwise entitled to. For practical reasons, the researchers will only be able to withdraw my data up to two weeks from the date that I participated in the study. However, after this point the researchers will still be able to delete my name and contact details if these have not already been deleted, rendering my data fully anonymous.</p> <p>I understand that if I have not provided my name and contact details it will not be possible for the researchers to delete my data once it has been submitted, as my data will be completely anonymous.</p>
6.	I understand the potential risks of participating and the support that will be available to me should I become distressed during the course of the research.
7.	No promise or guarantee of benefits have been made to encourage me to participate.
8.	I understand that the data will not be made available to any commercial organisations but is solely the responsibility of the researchers undertaking this study.
9.	I understand that I will not be compensated for my time spent in the study, however as a thank you for my participation, I have the option to be entered into a prize draw with the chance to win one of five £50 Amazon Vouchers.
10.	I agree that my anonymised research data may be used by others for future research, but that nobody will be able to identify me from this data.
11.	I understand that the information I have submitted will be published as a report and if I wish to see a copy of it I can contact the researchers directly.
12.	I hereby confirm that I understand and meet the inclusion criteria as detailed in the Information Sheet and explained to me by the researcher.
13.	<p>I hereby confirm that:</p> <p>(a) I understand the exclusion criteria as detailed in the Information Sheet and (b) I do not fall under the exclusion criteria.</p>
14.	I am aware of who I should contact if I wish to lodge a complaint.
15.	I voluntarily agree to take part in this study.
16.	<p>Use of information for this project and beyond</p> <p>I would be happy for the data I provide to be archived at the Research Department of Clinical, Educational and Health Psychology.</p> <p>I understand that other authenticated researchers will have access to my anonymised data.</p>

Appendix 5: Confirmation of ethical approval (original and amendments)



28th October 2019

Dr Madiha Shaikh
Research Department of Clinical, Educational and Health Psychology
UCL

Cc: Nancy Neath

Dear Dr Shaikh

Notification of Ethics Approval with Provisos

Project ID/Title: 15737/001: What individual characteristics influence the way that we communicate and express emotion in our close relationships?

Further to your satisfactory responses to the Committee's comments, I am pleased to confirm in my capacity as Chair of the UCL Research Ethics Committee (REC) that your study has been ethically approved by the REC until **28th October 2020**.

Ethical approval is subject to the following conditions:

Notification of Amendments to the Research

You must seek Chair's approval for proposed amendments (to include extensions to the duration of the project) to the research for which this approval has been given. Each research project is reviewed separately and if there are significant changes to the research protocol you should seek confirmation of continued ethical approval by completing an 'Amendment Approval Request Form'
<http://ethics.grad.ucl.ac.uk/responsibilities.php>

Adverse Event Reporting – Serious and Non-Serious

It is your responsibility to report to the Committee any unanticipated problems or adverse events involving risks to participants or others. The Ethics Committee should be notified of all serious adverse events via the Ethics Committee Administrator (ethics@ucl.ac.uk) immediately the incident occurs. Where the adverse incident is unexpected and serious, the Joint Chairs will decide whether the study should be terminated pending the opinion of an independent expert. For non-serious adverse events the Joint Chairs of the Ethics Committee should again be notified via the Ethics Committee Administrator within ten days of the incident occurring and provide a full written report that should include any amendments to the participant information sheet and study protocol. The Joint Chairs will confirm that the incident is non-serious and report to the Committee at the next meeting. The final view of the Committee will be communicated to you.

Final Report

At the end of the data collection element of your research we ask that you submit a very brief report (1-2 paragraphs will suffice) which includes in particular issues relating to the ethical implications of the research

Office of the Vice Provost Research, 2 Taviton Street
University College London
Tel: +44 (0)20 7679 8717
Email: ethics@ucl.ac.uk
<http://ethics.grad.ucl.ac.uk/>



VPRO.Ethics

Mon 11/11/2019 21:56

To: Neath, Nancy



 Amendment_Approval_Reque... 529 KB	 Template Participant Informat... 44 KB
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2 attachments (573 KB) Download all Save all to OneDrive - University College London

Dear Nancy,

The REC Chair has approved your attached amendment request. Please take this email as confirmation of that approval.

IMPORTANT: For projects collecting personal data only

You should inform the Data Protection Team – data-protection@ucl.ac.uk of your proposed amendments to include a request to extend ethics approval for an additional period.

Also, please note the newly updated wording for Local Data Protection Privacy Notices that appears in Section 14 of the attached template Participant Information Leaflet (PIL). Please update your PIL accordingly, incorporating the relevant link, i.e. health and care research or research studies.

With best wishes for your ongoing research, Magda

Dr Magdalena Morawska
Research Policy and Governance Officer
Office of the Vice-Provost (Research)
University College London
2 Taviton Street, London, WC1H 0BT

Tel: 02076791427 (21427)
Email: m.morawska@ucl.ac.uk



VPRO.Ethics

Tue 26/11/2019 22:47

To: Neath, Nancy



 Amendment_Approval_Reque... 530 KB	 Template Participant Informat... 44 KB
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2 attachments (574 KB) Download all Save all to OneDrive - University College London

Dear Nancy,

The REC Chair has approved your attached amendment request. Please take this email as confirmation of that approval.

IMPORTANT: For projects collecting personal data only

You should inform the Data Protection Team – data-protection@ucl.ac.uk of your proposed amendments to include a request to extend ethics approval for an additional period.

Also, please note the newly updated wording for Local Data Protection Privacy Notices that appears in Section 14 of the attached template Participant Information Leaflet (PIL). Please update your PIL accordingly, incorporating the relevant link, i.e. health and care research or research studies.

With best wishes for your ongoing research, Magda

Dr Magdalena Morawska
Research Policy and Governance Officer
Office of the Vice-Provost (Research)
University College London
2 Taviton Street, London, WC1H 0BT

Tel: 02076791427 (21427)
Email: m.morawska@ucl.ac.uk

Appendix 6: Participant debrief sheet

Study Debrief

Thank you very much for giving up your time to take part in our study. We hope that you found it an interesting experience. The information that you have provided will enhance our understanding of factors that affect the way that we communicate and express our emotion towards our loved ones. This information might help future researchers to better understand factors that might influence the way that we respond to our loved ones when they experience a physical or mental health difficulty.

Reflecting on our personality and our relationship with a significant other can bring up some difficult thoughts and feelings. If you are feeling in distress as a result of completing the study, you might find it helpful to complete a relaxation or mindfulness exercise available on this website:

<https://www.getselfhelp.co.uk/relax.htm>

You are also very welcome to contact Dr Madiha Shaikh, Clinical Psychologist (Principle Investigator on the study; [020 7679 8230](tel:02076798230)/ madiha.shaikh@ucl.ac.uk) or Nancy Neath, Trainee Clinical Psychologist (researcher; nancy.neath.14@ucl.ac.uk), who would be able to discuss this with you confidentially and signpost you to relevant support.

If you feel that you might benefit from some on going support, you might find it helpful to contact one of the following services:

- The Samaritans (Phone: 116 123/ Website: <https://www.samaritans.org/how-we-can-help/contact-samaritan/>). Support service for people experiencing distress.
- Improving Access to Psychological Therapies (IAPT; [https://www.nhs.uk/Service-Search/Psychological%20therapies%20\(IAPT\)/LocationSearch/10008](https://www.nhs.uk/Service-Search/Psychological%20therapies%20(IAPT)/LocationSearch/10008)) . Provide evidence based psychological therapies to people with anxiety and depression.
- <https://carers.org/> - Offer support to carers of people with physical or mental health difficulties.

If you would like any further information or if you have any questions regarding the study, then please feel free to contact the Researchers: Dr Madiha Shaikh ([020 7679 8230](tel:02076798230)/ madiha.shaikh@ucl.ac.uk) or Nancy Neath (nancy.neath.14@ucl.ac.uk).

Many thanks again for giving your time to participate in our research.

Nancy and Madiha

Appendix 7: Participant demographic questionnaire

Gender: *(drop down menu of options)*

Age: *(years – drop down menu of options)*

Which country do you currently live in? *(Drop down menu of options)*

What year did you arrive to live in that country? *(Drop down menu of options)*

Nationality: *(Free text space)*

Ethnicity: *(drop down menu of options, including ‘other’ option with free text space)*

What is the highest level of education that you have completed or are currently studying for? *(Drop down menu of options)*

Employment status: *(drop down menu of options)*

Do you currently have a mental health difficulty? *(yes or no option)*

If they answer yes, there will be space for them to write which mental health difficulty

Have you had a mental health difficulty in the past? *(yes or no option)*

If they answer yes there will be space for them to write which mental health difficulty

Do you currently have a physical health difficulty? *(yes or no option)*

If they answer yes there will be space for them to write which physical health difficulty

Have you had a physical health difficulty in the past? *(yes or no option)*

If they answer yes there will be space for them to write which physical health difficulty

As a ‘thank you’ for your participation, if you would like to be entered into a prize draw with the chance to win one of five £50 Amazon vouchers, and/ or you would like us to contact you with a summary of the results of the study, then please provide your name and contact details, and tick the relevant boxes below.

Yes, I would like to be entered into the prize draw *(tick box)*

Yes, I would like you to contact me with a summary of the results of the study *(tick box)*

Name: Email address: Telephone number: *(optional)*

Please note that if you do provide your name and contact details (email address and telephone number), they will only be used to let you know if you have won the prize draw (if you have indicated above that you want to be entered into the prize draw) and/ or to let you know about the results of the study (if you have indicated above that you would like to be contacted about the results of the study). Once your name and contact details are no longer needed for either or both of these purposes (depending on whether you ticked either or both of the boxes above), these details will be securely deleted.

**Appendix 8: Questionnaire about significant other's mental and
physical health history**

Think of a person you have a close relationship with.

This person needs to be:

- a.) someone that you live with
- b.) a relative (e.g. child/ parent/ sibling/ niece/ nephew/ uncle/ aunt/ grandparent/ grandchild etc.)
- c.) someone who if they were to become physically or mentally unwell, you would take a significant role in caring for them

We would like you to keep this person in mind whilst you answer the following questions:

- 1.) What is this person's relation to you (*drop down menu of options*)
- 2.) Does this person currently have any physical health difficulties?

If participant answers yes to question 1: the following will appear

- *Free text space to write the type of difficulty*
- The following question: do you consider yourself to take a significant role in caring for them with this difficulty? (*yes / no*)

- 3.) Does this person currently have any mental health difficulties?

If participant answers yes to question 2, the following will appear:

- *Free text space to write the type of difficulty*
- The following questions:
- do you consider yourself to take a significant role in caring for them with this difficulty? (*yes / no*)
- When did they experience this difficulty (if you selected more than one difficulty, when did they experience their most recent difficulty)? (*drop down menu will appear containing options of time frames e.g. weeks ago/ months ago/ more than a year ago/ more than 2 years ago etc*)

- 4.) Has this person ever had any physical health difficulties in the past?

If participant answers yes to question 3, the following questions will appear:

- *Free text space with space to write the type of difficulty*
- The following questions:
- Have you ever considered yourself to have taken a significant role in caring for them during the time they experienced a physical health difficulty? (*yes/ no*)
- When did they experience this difficulty (if you selected more than one difficulty, when did they experience their most recent difficulty)? (*drop down menu will appear containing options of time frames, as above*)

5.) Has this person ever had any mental health difficulties in the past?

If participant answers yes to question 4, the following questions will appear:

- *Free text space with space to write the type of difficulty*
- *The following questions:*
- *Have you ever considered yourself to have taken a significant role in caring for them during the time they experienced a mental health difficulty? (yes/ no)*
- *When did they experience this difficulty (if you selected more than one difficulty, when did they experience their most recent difficulty)? (drop down menu will appear containing options of time frames, as above)*

Appendix 9: Assumption violations for multiple linear regression models

Regression Model	Assumptions not met
DV = EE-criticism Predictors = Inadequate self + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EE-criticism Predictors = reassured self + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EE-criticism Predictors = hated self + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and the DV against the hated self variable
DV = EE-criticism Predictors = LOC + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and the DV against the LOC variable
DV = EE-criticism Predictors = IIP + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EE-Criticism Predictors = Extraversion + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EE-Criticism Predictors = Agreeableness + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and the DV against the agreeableness variable
DV = EE-Criticism Predictors = Conscientiousness + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EE-Criticism Predictors = Negative Emotionality + control variables ^a	- Homoscedasticity - Durbin-Watson test ^b (1.657) = evidence of positive autocorrelation - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and the DV against the negative emotionality variable
DV = EE-Criticism Predictors = Openness + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EOI Predictors = inadequate self + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EOI Predictors = reassured self + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EOI Predictors = hated self + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and the DV against the hated-self variable

DV = EOI Predictors = LOC + control variables ^a	- Homoscedasticity - Durbin-Watson test (1.466) = evidence of positive autocorrelation - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and the DV against the Locus of control variable
DV = EOI Predictors = IIP + control variables ^a	- Homoscedasticity - possible non-linearity between the DV and IIP
DV = EOI Predictors = Extraversion + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and the DV against the extraversion variable
DV = EOI Predictors = Agreeableness + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EOI Predictors = Conscientiousness + control variables ^a	- Homoscedasticity - Durbin-Watson test (1.589) = evidence of positive autocorrelation - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and the DV against the conscientiousness variable
DV = EOI Predictors = Negative Emotionality + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables
DV = EOI Predictors = Openness + control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and the DV against the openness variable
DV = EE-Criticism Predictors = inadequate self, reassured self, hated self, IIP, openness, plus control variables ^a	- Homoscedasticity - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and between the DV and reassured self variable
DV = EOI Predictors = inadequate self, reassured self, hated self, IIP, LOC, plus control variables ^a	- Homoscedasticity - Durbin-Watson test (1.656) = evidence of positive autocorrelation - Possible lack of linearity in the scatterplot of the DV against all the predictor variables and between the DV and hated self variable
<p><i>Note.</i> DV = Dependent variable; EOI = Emotional over-involvement; LOC = Locus of Control of Behaviour Scale; IIP = Inventory of Interpersonal Problems – 32; ^a = whether or not the participant currently has a physical health or mental health difficulty, or whether or not they had one in the past, relationship type, whether or not their significant other currently has a mental or physical health difficulty, and whether or not they had one in past. ^b = test for independence of errors. Linearity checked by a.) Looking at scatterplots of the studentised residuals against the unstandardized predicted values of all the predictor variables and b.) Between the DV and each of the IV's (ignoring categorical variables) via partial regression plots</p>	