

# **Negative life experiences, alexithymia, and physical symptoms**

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## **Declaration**

This thesis has been submitted for the award of Doctorate in Clinical Psychology at The University of Sheffield. It has not been submitted for any other qualification or to any other academic institution.

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## Structure and Word Count

Literature review	7,852
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## **Abstract**

Estimates suggest that a large proportion of people attending medical appointments have symptoms that are not entirely attributable to structural or pathophysiological explanations – often termed ‘functional symptoms’. These symptoms are distressing for individuals and are associated with high healthcare costs.

A range of psychosocial factors, including negative life experiences of trauma, negative affect, and relationship insecurity, are believed to play a role in the development, maintenance, and reporting of these symptoms. Developmental theories suggest that these psychosocial factors might also interact with one another and impact emotional development, thus making people more vulnerable to the emotional processing difficulty of alexithymia, which is also associated with functional symptoms.

Therefore, this thesis begins by exploring relationships between insecure attachment styles, alexithymia, and symptoms that are not fully explained medically, through a review of existing literature. It then builds on previously published work by validating a new measure of trauma, affect, and relationship insecurity. It tests the reliability and validity of the measure and the measure’s ability to predict the potentially relevant variables of emotional processing difficulties and physical symptom reporting in a community sample. It also explores whether alexithymia and relationship insecurity mediate the relationship between early life trauma and current physical symptom reporting within this sample.

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## **Acknowledgements**

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As the final piece of written work, this thesis feels like the culmination of the doctorate, which has spanned academic, research, and clinical work. Therefore, I would like to thank the entire clinical psychology course team, my clinical and academic tutors, my placement and research supervisors, everyone who taught on the course, and my fellow trainees. Thank you for encouraging, supporting, and challenging me, and for the much needed laughter during the past three years. I am also grateful to my previous clinical neuropsychology colleagues for believing in me enough to give me my first clinical role, and for supporting me as I applied for training.

Finally, thank you to all of my wonderful family and friends for your continued patience and unwavering support in all that I do. In particular, this research has made me more grateful than ever to my parents for giving me the confidence to explore the world and pursue my goals, and for being there for me, no matter where I go. Last but certainly not least, I would like to thank my husband, Ben, who has inspired me to dream, and who has supported me every step along the way to make those dreams come true. I couldn't have done it without you.

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## **Section One: Literature Review**

Attachment Insecurity and Alexithymia in Somatisation:  
A Review of the Literature

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## **Abstract**

**Objectives.** This review aimed to summarise existing research exploring the role of two factors that could serve as potential mediating variables between early life adversity and somatisation. Specifically, attachment insecurity and the emotional processing difficulty of alexithymia were chosen.

**Methods.** Three databases (PsychInfo, PubMed, and Web of Science) were searched for research studies including terms related to somatisation, alexithymia, and attachment using the search terms (attachment) AND (alexithymia), combined with each of six different terms for somatisation. These were: 1) somati\*, 2) psychosomatic, 3) functional, 4) conversion disorder, 5) medically unexplained, and 6) psychogenic. Following the removal of those studies that did not meet the inclusion criteria, ten quantitative studies remained.

**Results.** In the majority of studies, rates/levels of both attachment insecurity and alexithymia were high in the groups with symptoms related to somatisation. In addition, several studies identified that attachment insecurity and alexithymia co-occurred, and that there were relationships between attachment insecurity and alexithymia.

**Conclusions.** This review provides some support for the theory that attachment insecurity and alexithymia could both arise from similar experiences, and that both are related to somatisation. Therefore, they could serve as mediating variables between early life adversity and somatisation. However, more research is needed to understand the precise relationships between these variables.

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## **Practitioner Points**

- Higher levels of attachment insecurity and alexithymia are common in people with somatisation related symptoms, and attachment insecurity and alexithymia are likely to co-occur with one another.
- Interventions focused on developing different ways of relating interpersonally and/or facilitating emotional awareness and expression could be helpful for people with symptoms related to somatisation.

## **Limitations**

- This review includes only a small number of studies, and in some studies, the participants' symptoms in the somatisation groups were at least partially explained by pathophysiological causes.
- Very few of the studies directly explored the relationships between attachment insecurity, alexithymia, and somatisation. Therefore, more research is needed to understand the precise relationships between these variables.

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## Introduction

Developmental theories suggest that emotional expression, and perhaps particularly the expression of negative affect, serves as a signal to caregivers that the infant needs support, and these emotional expressions serve to build and maintain the attachment relationship (Ainsworth, Blehar, Waters, & Wall, 1978; Cassidy, 1994). When caregivers are not responsive to an infant's emotional expressions, children learn that their needs will not be met, and therefore, they might begin to either minimise (insecure avoidant attachment style) or amplify (insecure anxious attachment style) their expressions of distress (Bowlby, 1982; Cassidy, 1994).

In addition to shaping attachment styles, there is some evidence that the ways in which caregivers respond to the emotional expressions of babies and young children are important in shaping emotional development. Without this support, children might be more vulnerable to developing alexithymia, which is defined as difficulty experiencing, identifying, and describing emotions (Nemiah, Freyberger, & Sifneos, 1976). For example, a recent study found that young children who are not supported to develop emotional language have more difficulty identifying and describing their own emotional experiences as they grow up (Lemche, Klann-Delius, Koch, & Joraschky, 2004). However, people with alexithymia still experience the physiological arousal associated with emotional distress, perhaps to an even greater degree than people without alexithymia (Brown & Reuber, 2016; Gueney, Sattel, Cardone, & Merla, 2015; Peasley-Miklus, Panayiotou, & Vrana, 2016).

Therefore, both attachment insecurity and alexithymia are likely to influence the ways people express their distress, including when and how they report both physical and emotional symptoms (Aust, Haertwig, Heuser, &

Bajbouj, 2013; Ciechanowski et al., 2002; Landa, Bossis, Boylan, & Wong, 2012; Landa, Peterson, & Fallon, 2012). For example, people with avoidant attachment styles might be less likely to report certain difficulties and thus continue to struggle on their own until symptoms become unmanageable, whereas people with anxious attachment styles (also known as preoccupied or ambivalent attachment styles) might be more likely to over-report or amplify difficulties to try to elicit care. In addition, if the same people also find it difficult to accurately perceive and describe their emotional experiences, but they experience at least equivalent physiological arousal (Gueney et al., 2015; Peasley-Miklus et al., 2016), this could lead to reporting of physical symptoms without recognition of emotional links (Taylor, Bagby, & Parker, 1997). Therefore, attachment insecurity and alexithymia could both arise from similar types of early life adversity, and they could also interact in interesting ways to influence symptom reporting.

Perhaps unsurprisingly, both attachment insecurity and alexithymia have both been associated with somatisation (e.g., Armitage & Harris, 2006; Ciechanowski, Walker, Katon, & Russo, 2002; De Gucht & Heiser, 2003; Liu, Cohen, Schulz, & Waldinger, 2011; Taylor, Marshall, Mann, & Goldberg, 2012), which is defined as the “conversion of a mental state into physical symptoms” or “the existence of physical body complaints in the absence of a known medical condition” (Merriam-Webster’s online dictionary, n.d.). In addition, early life adversity – and particularly interpersonal trauma/neglect – is also associated with somatisation (e.g., Brown, Schrag, & Trimble, 2005). Therefore, it is possible that attachment insecurity and alexithymia could serve as pathways between early life adversity and current symptom reporting/somatisation.

## **Literature Review Aims**

Although no research to date has directly explored attachment insecurity and alexithymia as mediators between early life adversity and somatisation, there are a small number of studies that have included measures of both attachment insecurity and alexithymia in a group of people with symptoms related to somatisation. As a starting point, this review will assess whether attachment insecurity and alexithymia occur more frequently in the context of somatisation (i.e., at high rates/levels in a group with somatisation related symptoms and/or at a higher rates/levels compared with a control group). Where possible, it will also look at relationships between attachment insecurity and alexithymia. If attachment insecurity and alexithymia do tend to occur at high rates (or levels) in the somatisation groups, and are associated with one another, this provides some initial support for the theory that attachment insecurity and alexithymia could both develop as a result of early life adversity, and that they could interact and mediate the relationship between early life adversity and somatisation.

## **Method**

In line with the aims of this review, and to ensure optimal opportunities to explore relationships between attachment insecurity and alexithymia within the context of somatisation, only studies including measures of both attachment and alexithymia, where at least one group of participants had symptoms that were understood to result from somatisation, were included.

## Terminology

**Attachment.** In line with developmental theories regarding the interaction between early life experiences and attachment styles, and research linking attachment styles and somatisation, this review focused specifically on attachment. Attachment specifically refers to styles of relating interpersonally that are formed through very early experiences (Bowlby, 1982; Ainsworth et al., 1978), rather than including bonding, closeness with parents, or relationships more generally. However, these concepts are likely to be closely related.

**Alexithymia.** The term 'alexithymia' was used to describe a very specific type of emotional processing difficulty. Therefore, no other search terms were used for this concept.

**Somatisation.** Clinical presentations of somatisation can vary widely (e.g., Nimnuan, Hotopf, & Wessely, 2001) along a continuum from symptoms that all humans experience (e.g., stomach discomfort in response to acute anxiety) to those that become chronic (e.g., irritable bowel syndrome). Somatisation can occur in isolation or it can co-occur with identifiable medical conditions (Reuber, Mitchell, Howlett, Crimlisk, & Grunewald, 2005). In addition, some conditions or subtypes of conditions that do have a structural or pathophysiological explanation are also strongly influenced by stress (e.g., diffuse plaque psoriasis is strongly influenced by stress: Picardi et al., 2005, but psoriasis more generally is not strongly influenced by stress: Picardi et al., 2003). For the purposes of this review, the term 'somatisation' is used here to refer to all symptoms or conditions understood to be influenced by emotional factors/stress, whether or not they are also underpinned by pathophysiological causes. Therefore, a range of search terms were used, and these are listed below in the search strategy.

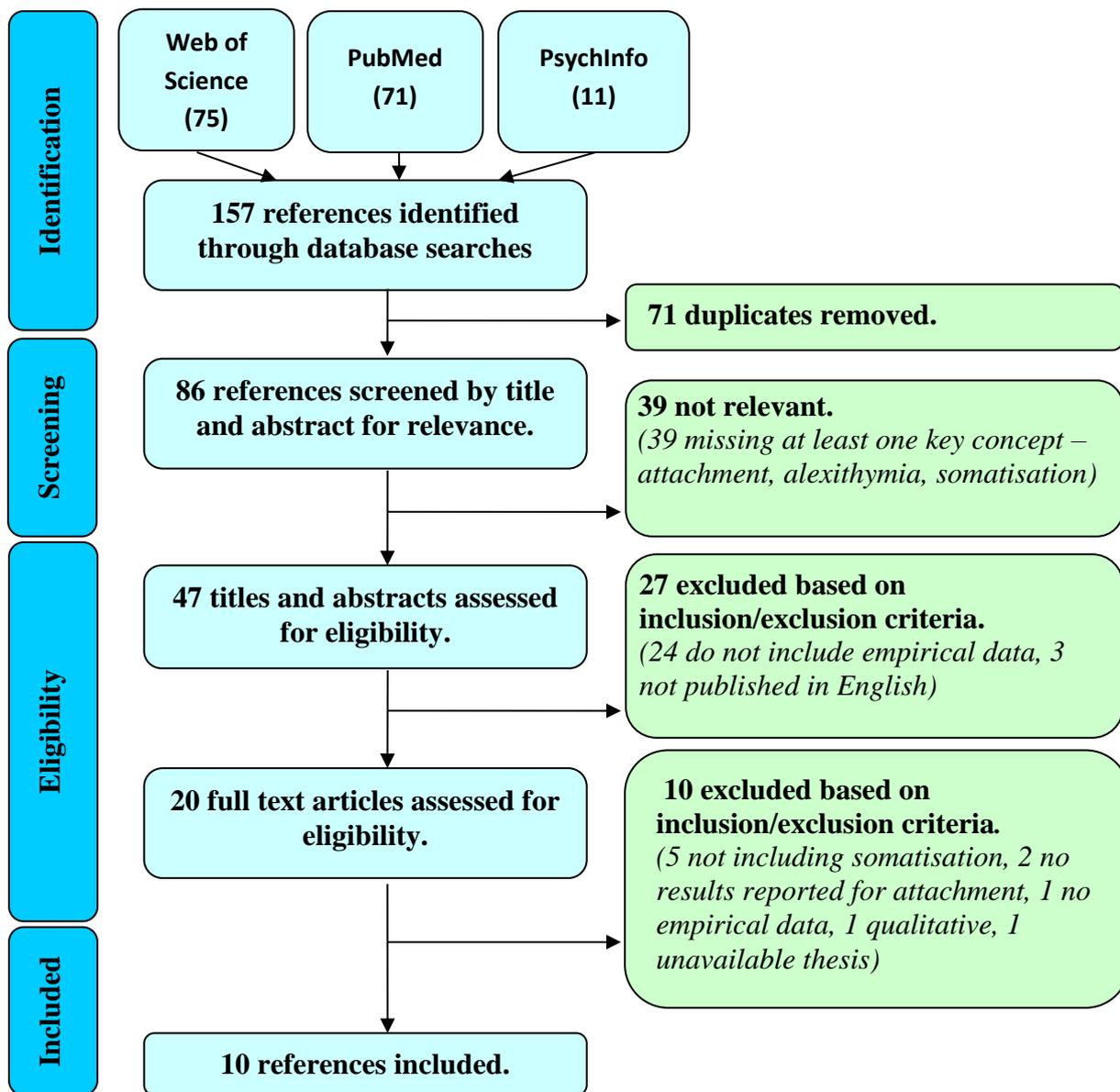
## **Search Strategy**

The literature search was carried out on the 15<sup>th</sup> February 2016, and all references (as far back as each database reached) up until the date of searching were included. The following databases were searched: Web of Science, PubMed, and PsychInfo. For each database, three search terms were combined to identify studies of both attachment and alexithymia in groups with suspected somatisation. Therefore, the search terms (attachment) AND (alexithymia) were combined with each of six different terms for somatisation. These were: 1) somati\*, 2) psychosomatic, 3) functional, 4) conversion disorder, 5) medically unexplained, and 6) psychogenic. These searches generated 157 references, with more details shown in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA: Moher, Liberati, Tetzlaff, & Altman, 2009) diagram in Figure 1.

## **Screening**

Following the removal of duplicates, 86 titles and abstracts were screened for relevance. From this initial screening, 47 potentially relevant references were identified. Further screening was then carried out based on the inclusion/exclusion criteria specified below.

Figure 1. PRISMA diagram



**Inclusion/exclusion criteria.** Studies needed to include at least one group of participants with symptoms thought to be caused or exacerbated by stress/emotional factors (i.e., somatisation). Articles needed to be written in English or have an English translation available. All articles needed to include empirical quantitative research, and they had to measure both attachment and alexithymia in a group with somatisation. Any studies not meeting all of these criteria were excluded.

**Final screening.** Of the 47 abstracts screened, 20 met the inclusion criteria and the full text articles were read. After reading the full-text articles, 10 further articles were excluded due to studies not including all three key constructs (somatisation, attachment, and alexithymia), not including empirical data, using qualitative methodologies, or not being available. This left 10 papers that were included in this review.

### **Quality Assessment of Studies**

All studies were assessed using the Critical Appraisal Skills Programme (CASP: Singh, 2013) quality control checklist for case-control studies. This checklist includes 11 questions that focus on assessing whether the results are valid (questions 1 to 7), how precise and believable the results are (questions 8 and 9), and whether the results are generalizable/applicable (questions 10 and 11).

In Table 1 (below), the specific questions are listed in the notes. For each question, a response of yes (Y) indicates that the study was judged to have managed that aspect of the study in a way that made it more likely to be valid / believable / generalizable. A response of no (N) indicates something that was judged to be a weakness of the study. Where it was not possible to determine the answer based on the information given in the study, a symbol (-) was used to indicate this, and where the question was not applicable to the study, this was stated (N/A). By looking at each question, it is possible to look specifically at the individual strengths and weakness of each study in detail. However, it is also possible to see quickly that the studies tended to have a number of strengths but also some weaknesses.

Table 1. *Critical Appraisal Skills Programme (CASP) Case Control Checklist Results*

Author and year	1	2	3	4	5	6a	6b	7	8	9	10	11
Barbasio et al., 2013	Y	Y	N	-	N/A	Did not give characteristics of control group.	N	+	Y	-	-	Y
Barbosa et al., 2011	Y	Y	Y	-	N/A	Between-group differences in employment status, residence, and education were identified. Cases were older than controls, and there were gender differences.	N	+	Y	Y	Y	Y
Bengtsson et al., 2013	Y	Y	Y	Y	N/A	Cases were older than controls, and there were gender differences.	Y	+	Y	Y	Y	N
Brown et al., 2013	Y	Y	Y	Y	N/A	No significant differences in age, gender, marital status, employment status, qualifications, or seizure frequency.	N/A	+	Y	Y	-	Y
Gil et al., 2008*	Y	Y	Y	N/A	N/A	N/A	N/A	+	Y	Y	Y	Y
Koelen et al., 2015*	Y	Y	-	N/A	N/A	N/A	N/A	+	Y	Y	-	-
Picardi et al., 2003a	Y	Y	Y	Y	N/A	Gender difference between cases and controls	N	+	Y	-	Y	-
Picardi et al., 2003b	Y	Y	Y	Y	N/A	Cases had lower education level than controls	N	+	N	-	Y	-
Picardi et al., 2005	Y	Y	Y	Y	N/A	Cases were older and had lower education level than controls	-	+	Y	Y	Y	-
Solano et al., 2000	Y	N	-	-	N/A	Groups were matched for age, education, and gender.	Y	+	Y	Y	N	-

Note: 1=Did the study address a clearly focused issue?; 2=Did the authors use an appropriate method to answer their question?; 3=Were the cases recruited in an acceptable way?; 4=Were the controls selected in appropriate way?; 5=Was the exposure accurately measured to minimise bias?; 6a=What confounding factors have the authors accounted for?; 6b=Have the authors taken account of the potential confounding factors in the design and/or in their analysis?; 7=What are the results of this study?; 8=How precise are the results?; 9=Do you believe the results?; 10=Can the results be applied to the local population?; 11=Do the results of this study fit with other available evidence?; Y=Yes (for question 8, Y=significance values were given to at least two decimal places); N=No (for question 8, N=significance values were not given to at least two decimal places); - =partially or can't tell, + =discussed in main body of paper; N/A=not applicable; \*=Cohort study (no control group).

In general, the studies addressed a clearly focused issue and used an appropriate methodology. The majority provided specific details about their methods and results, and the results were judged to be believable. The most common weaknesses were studies having confounding factors that they did not taken into account in their analyses. For example, the recruitment methods of some studies could have led to selection bias (particularly for the control groups), and although some studies identified differences between the somatisation group and control group, they generally did not explore or control for those differences. There were also some inconsistencies in the findings between studies. However, the inconsistencies between studies were generally minor (e.g., type of insecure attachment style that predicted symptom reporting) or the inconsistencies did not relate to the variables that were the primary focus of this review. Given the small number of studies available, no studies were excluded on the basis of this appraisal, but the methodological issues highlighted by the appraisal are important to bear in mind when thinking about the generalisability of the results. The limitations will be discussed further in the Discussion.

## **Results**

The results of this literature review will be split into two sub-sections. The first section will report the methods used in the studies and any methodological issues highlighted by the authors. The second section will report the results of the studies, focusing on attachment insecurity and alexithymia in the context of somatisation. Therefore, tables will be used to summarise the rates/levels of these two variables in the somatisation group (and comparing this to a control group when that information is available). For studies that have assessed the

relationship between these variables and somatisation more directly, those results will also be reported. In addition, any relationships between attachment insecurity and alexithymia will be highlighted. There will also be a brief overview of any other relevant results.

## **Methods and Methodological Issues**

In total, the included studies contained 968 participants ( $n = 528$  of those participants were in the somatisation groups). The majority of studies included both men and women, and all participants were over the age of 18 years old. Studies were carried out in Italy ( $n = 5$  studies), Portugal, Sweden, England, Denmark, and the Netherlands ( $n = 1$  study each). Two of the ten studies included in this review were cohort studies (Gil, Scheidt, Hoeger, & Nickel, 2008; Koelen, Eurelings-Bontekoe, Stuke, & Luyten, 2015). These studies only included people with symptoms thought to be influenced by somatisation. Eight of the ten included studies were case control studies. These case control studies all included one group with symptoms thought to be influenced by somatisation ('somatisation group') and one control group (see Tables 2a to 2c).

Somatisation groups were comprised of people with a range of different symptoms. The symptoms in the included studies varied between those that have a pathophysiological explanation but are affected by stress (e.g., systemic lupus erythematosus, and the specific skin conditions chronic urticaria, alopecia, vitiligo, and diffuse plaque psoriasis) to those which are more commonly considered to result from somatisation without another pathophysiological explanation (e.g., irritable bowel syndrome and psychogenic non-epileptic seizures). Some studies included people with just one specific condition or type of symptom. These conditions were: 1) systemic lupus

Table 2a. Methods and methodological issues

Author and year	Study design	Participants	Recruitment	Measures of Attachment and Alexithymia		
				Attachment: AAI <i>Alexithymia: TAS-20</i>	Other Relevant Measures <i>Dissociation: DES.</i>	Author Critique
Barbasio et al., 2013	Within, between groups	<i>Somatization group: Adult women with diagnosis of SLE (n=40 mean age=44.1, s.d.=10.8); Control group: nonclinical not-at-risk group and clinical at-risk group from other study.</i>	Italian SLE charity (SLE group only).			<i>Sample</i> – small sample size, non-random recruitment; <i>Measures</i> – did not include any measures of symptom/disease severity or duration.
Barboso et al., 2011	Within, between groups	<i>Somatization group: Adults with CU diagnosis (n= 55); Control group: healthy volunteers (n=31)</i>	Outpatient dermatology clinics in Portugal.	<i>Attachment: AAS-R, Alexithymia: TAS-20</i>	<i>Physical symptoms: CU reactions (classified by history, physical examination, laboratory assessment, and histopathologic findings. Physical symptoms: Visual Analogue Scale for IBS (6 symptoms; used with IBS group only).</i>	<i>Samples</i> – small sample; control group did not have a medical condition; <i>Measures</i> – self-report; <i>Design</i> – cross-sectional (no longitudinal factors).
Bengtsson et al., 2013	Between groups	<i>Somatization group: Adults with IBS diagnosis (n=81); Control group: Adults with IBD diagnosis (n=74).</i>	Outpatient and inpatient clinics in Sweden.	<i>Attachment: ECR, Alexithymia: TAS-20</i>	<i>Physical symptoms: Visual Analogue Scale for IBS (6 symptoms; used with IBS group only).</i>	<i>Sample</i> – small sample size led to lack of statistical power.
Brown et al., 2013	Within, between groups	<i>Somatization group: Adults with PNEs (n=43); Control group: Adults with epilepsy (n=24); no differences between groups in seizure frequency.</i>	Neurologist and neuropsychologist caseloads from hospitals in north of England.	<i>Attachment: RSQ, Alexithymia: TAS-20</i>	<i>Somatiform dissociation: SDQ-20; Demographic and seizure information – Demographic and seizure questionnaire; Emotion regulation – DERS.</i>	<i>Sample</i> – small sample, possible selection bias, low survey return rate, some ppts without video EEG, comorbid conditions not known; <i>Measures</i> – all self-report.

Notes: Abbreviations are grouped by table column, then alphabetical order. *Participants*: Somatisation group=group expected to have symptoms more related to somatisation; Control group=group with symptoms expected to be less affected by somatisation; SLE=systemic lupus erythematosus; CU=chronic urticaria; IBS=Irritable Bowel Syndrome; IBD=Inflammatory Bowel Disease; PNEs=psychogenic non-epileptic seizures. *Measures of Attachment and Alexithymia*: AAI=Adult Attachment Interview; AAS-R=Adult Attachment Scale – Revised; ECR=Experiences in Close Relationships scale; RSQ=Relationship Scales Questionnaire TAS=Toronto Alexithymia Scale; TAS. *Other Relevant Measures*: DERS=Difficulties in Emotion Regulation Scale; DES=Dissociative Experiences Scale; MOPS=Measure of Parenting Style; SCL-90-R=Symptom Checklist Revised; SDQ-20=Somatoform Dissociation Questionnaire-20.

Table 2b. Methods and methodological issues

Author and year	Study design	Participants	Recruited from	Measures of Attachment and Alexithymia		Author Critique
				Attachment	Other Relevant Measures	
Gil et al., 2008	Within group	<i>Somatization group</i> : Adults with somatoform disorders (n=76).	Outpatient and inpatient clinics in Germany.	<i>Attachment</i> : BFKE, <i>Alexithymia</i> : TAS-26	<i>Somatization</i> : SOMS and SCL-90-R; <i>Parenting style</i> – MOPS.	<i>Sample</i> – ppts might not be representative, comorbid psychiatric disorder cannot be excluded; <i>Measures</i> – self-report; <i>Design</i> – cross-sectional (no longitudinal or control elements). <i>Sample</i> – small sample, ppts might not be representative; <i>Measures</i> – all self-report; <i>Design</i> – cross-sectional.
Koelen et al., 2015	Within group	<i>Somatization group</i> : Adults with somatoform disorder (n=128), recruited in the Netherlands.	Specialist treatment centre in Netherlands.	<i>Attachment</i> : ECR-R, <i>Alexithymia</i> : BVAQ, TAS-20	<i>Stressful life events</i> : Paykel's Interview for past 12 months; <i>Social Support</i> : Multidimensional Scale of Perceived Social Support.	<i>Sample</i> – small sample size; <i>Measures</i> – no measures of depression/anxiety; <i>Results</i> – significance often borderline.
Picardi, Pasquini, Cattaruzza, Gaetano, Baliva, et al. 2003	Between groups	<i>Somatization group</i> : Adults with alopecia (n=21), <i>Control group</i> : Adults with skin conditions where psychosomatic factors thought to be minimal (n=102).	Outpatient dermatology clinic in Italy.	<i>Attachment</i> : ECR, <i>Alexithymia</i> : TAS-20	<i>Stressful life events</i> : Paykel's Interview for past 12 months; <i>Social Support</i> : Multidimensional Scale of Perceived Social Support.	<i>Sample</i> – most ppts had recently experienced exacerbation rather than onset, vitiligo sample too small to analyse separately; <i>Design</i> – not possible to determine causality.
Picardi, Pasquini, Cattaruzza, Gaetano, Melchi et al., 2003	Between groups	<i>Somatization group</i> : Adults with vitiligo (n=31), <i>Control group</i> : Adults with skin conditions where psychosomatic factors thought to be minimal (n=116).	Outpatient dermatology clinic in Italy.	<i>Attachment</i> : ECR, <i>Alexithymia</i> : TAS-20	<i>Stressful life events</i> : Paykel's Interview for past 12 months; <i>Social Support</i> : Multidimensional Scale of Perceived Social Support.	<i>Sample</i> – most ppts had recently experienced exacerbation rather than onset, vitiligo sample too small to analyse separately; <i>Design</i> – not possible to determine causality.

Notes: Abbreviations are grouped by table column, then alphabetical order, *Participants*: Somatization group=group expected to have symptoms more related to somatization; Control group=group with symptoms expected to be less affected by somatization; *Measures of Attachment and Alexithymia*: BFKE=Bielefeld Client Expectations Questionnaire; BVAQ=Bermond-Vorst Alexithymia Questionnaire; ECR=Experiences in Close Relationships scale; RIS=Rorschach Interaction Scale; TAS=Toronto Alexithymia Scale. *Other Relevant Measures*: BSI=Brief Symptom Inventory; FAQ=Family Attitude Questionnaire; SOMS=Screening for Somatic Symptoms.

Table 2 c. Methods and methodological issues

Author and year	Study design	Participants	Recruited from	Measures of Attachment and Alexithymia		Author Critique
				Attachment: ECR, Alexithymia: TAS-20	Other Relevant Measures	
Picardi et al., 2005	Between groups	<i>Somatization group</i> : Adults with diffuse plaque psoriasis (n=33). <i>Control group</i> : Adults with skin conditions where psychosomatic factors thought to be minimal (n=73).	Inpatient dermatology unit in Italy.		<i>Stressful life events</i> : Paykel's Interview for past 12 months; <i>Social Support</i> : Multidimensional Scale of Perceived Social Support.	<i>Sample</i> – only included inpatients, some demographic differences between cases and controls, small sample; <i>Design</i> – not possible to determine causality.
Solano et al., 2000	Within groups, between groups	<i>Somatization group</i> : Adults with medical symptoms in which psychological factors are thought to contribute significantly (n=20); <i>Control group</i> : Adults with psychosis (n=20).	Outpatient clinics in Italy.	<i>Attachment</i> : RIS, <i>Alexithymia</i> : TAS-20	<i>Intrafamilial relationships</i> : FAQ	<i>Sample</i> – small sample size, lack of random sampling; diagnostic heterogeneity of ppts, lack of healthy comparison group.

Notes: Abbreviations are grouped by table column, then alphabetical order; *Participants*: Somatisation group=group expected to have symptoms more related to somatisation; Control group=group with symptoms expected to be less affected by somatisation; *Measures of Attachment and Alexithymia*: ECR=Experiences in Close Relationships scale; RIS=Rorschach Interaction Scale; TAS=Toronto Alexithymia Scale. *Other Relevant Measures*: FAQ=Family Attitude Questionnaire.

erythematosus (SLE: Barbasio & Granieri, 2013), 2) irritable bowel syndrome (IBS: Bengtsson, Sjoberg, Candamio, Lerman, & Ohlsson, 2013), 3) psychogenic non-epileptic seizures (PNES: Brown et al., 2013), and 4) specific skin conditions that are influenced by stress (Barboso et al., 2011; Picardi et al., 2005; Picardi, Pasquini, Cattaruzza, Gaetano, Baliva, Melchi, Papi, et al., 2003; Picardi, Pasquini, Cattaruzza, Gaetano, Melchi, et al., 2003). Three other studies included participants with a range of different symptoms, all of which were understood to result from somatisation (Gil et al., 2008; Koelen et al., 2015; (Solano, Toriello, Barnaba, Ara, & Taylor, 2000).

The control groups were generally either a non-clinical group or a different clinical group that also had physical symptoms. In studies where the control group also had physical symptoms, these groups were chosen to have similar symptoms to the somatisation group, but for these symptoms to have pathophysiologically explained causes where emotional distress was not believed to be a significant factor. The only exception to this was the study by Solano et al. (2000), where the control group was composed of people with psychosis, which is also thought to be influenced by a range of biological and psychosocial factors.

In line with the inclusion criteria, all studies included measures of alexithymia and attachment. For alexithymia, all of the studies included the Toronto Alexithymia Scale (TAS: Parker, Taylor, & Bagby, 2003), although several studies also included another measure of alexithymia. Measures of attachment were more variable, but the Experiences in Close Relationships (ECR: Fraley, Waller, & Brennan, 2000) scale was most common. The studies also measured a wide range of other relevant variables, including physical symptoms, stressful life events, social support, trauma, dissociation, and

emotion regulation. However, the other variables being measured were inconsistent across the studies.

Consistent with the quality appraisal described above, the authors of the papers highlighted methodological issues with their studies, and there were some similar themes. The majority of studies commented on small sample sizes and several pointed out that their samples might not be representative of the wider populations. Many studies commented on the limitations of using a cross-sectional design, as this did not allow them to draw conclusions about causality. Some also mentioned limitations of the measures they used, particularly in cases where all measures were self-report.

### **Study Findings**

Tables 3a to 3c summarise the results of the ten studies, breaking the results down into links between insecure attachment styles and somatisation, alexithymia and somatisation, and attachment insecurity and alexithymia. A separate column of the table summarises any other relevant results of each study. Effect sizes are not provided in the table, as the majority of studies did not provide the necessary information to carry out the calculations, which is a limitation of this review.

Where there were two groups of participants, the group whose symptoms were understood to be more influenced by somatisation were called the 'somatisation group' (SG). However, it is acknowledged that the division between the groups is not entirely straightforward, as some of the conditions included in the somatisation group also have known pathophysiological causes.

Table 3a. *Summary of Results*

<b>Author and year</b>	<b>Alexithymia and Somatisation</b>	<b>Insecure Attachment and Somatisation</b>	<b>Insecure Attachment and Alexithymia</b>	<b>Other Relevant Factors</b>
Barbasio et al., 2013	Significant positive correlation between alexithymia (all three factors of TAS) and dissociation in SG; amnesic dissociation explained 38% of variance in alexithymia.	Majority of SG had insecure/unresolved attachment styles (62.5%); they had over-representation of entangled and unresolved, under-representation of dismissing styles, relative to control group.	Significant main effect of attachment style (secure, insecure, unresolved) on TAS total and DDF subscale; insecure and unresolved attachment styles predicted higher alexithymia scores than secure attachments.	
Barboso et al., 2011	Significant correlation between alexithymia and somatisation; high prevalence of alexithymia or borderline alexithymia in SG (76.4%), and significantly higher level of alexithymia in SG than control group; within SG group, alexithymic and non-alexithymic subgroups identified, and there were significant differences in somatisation between these subgroups.		Significant correlations between alexithymia scores and both anxious and avoidant insecure attachment styles; these insecure attachment styles (both anxious and avoidant) also significantly predicted alexithymia scores in a regression analysis.	
Bengtsson et al., 2013	Higher rate of alexithymia in SG than control group, but n.s. when adjusted for gender and age.	SG scored higher than control group on anxious attachment; no differences on avoidant attachment.		SG had lower self-esteem, no correlations between symptom reporting in the SG and scores on other measures.
Brown et al., 2013	Trend (n.s.) for higher alexithymia (DDF and DIF subscales) in SG than control group; two SG subgroups identified, Cluster 1 with higher alexithymia and somatisation than cluster 2 and control groups.	SG Cluster 1 (who have trend toward more attachment insecurity than other two groups) had higher level of somatoform dissociation scores than Cluster 2 and control groups.	Trend toward SG Cluster 1 (who have higher levels of alexithymia) having more attachment insecurity than SG Cluster 2 and control group.	SG had higher levels of emotional dysregulation than control group; SG Cluster 1 had higher levels of emotional dysregulation than SG Cluster 2 and control groups.

Notes: SG=somatisation group; ppts=participants; TAS=Toronto Alexithymia Scale.

Table 3b. *Summary of Results*

<b>Author and year</b>	<b>Alexithymia and Somatisation</b>	<b>Insecure Attachment and Somatisation</b>	<b>Insecure Attachment and Alexithymia</b>	<b>Other Relevant Factors</b>
Gil et al., 2008	High rate of alexithymia in ppts in SG (22.4% of ppts with clinically significant TAS total score, highest scores for DIF); somatisation (measured by SCL-90-R) was a significant predictor of high TAS total score.	Majority of ppts in this study (all in the SG) had insecure attachment styles (88.2%)	Ambivalent clinging attachment style predicted high TAS total score; ambivalent clinging and ambivalent withdrawing attachment styles predicted high DIF score. These variables did not significantly predict the other TAS subscale scores.	High level of general psychiatric symptomatology and high rate of psychiatric comorbidity, low to moderate levels of reported anxiety and depression; general psychiatric symptomatology was significant predictor of high alexithymia.
Koelen et al., 2015			Attachment hyperactivation and deactivation predicted cognitive alexithymia, explaining significant proportion of variance even after other significant variables; for affective alexithymia, neither type of insecure attachment strategy added significantly to the model.	Negative affectivity borderline significantly predicted cognitive alexithymia and significantly predicted affective alexithymia; personality pathology significantly added to the prediction of cognitive but not affective alexithymia; gender was not associated with either attachment strategy. No significant between group differences for number of stressful events, undesirable or major events, or perceived social support; control group reported more uncontrollable events. No significant group differences for number of stressful, undesirable or major events, but SG more likely to experience three or more uncontrollable events and to report less perceived social support.
Picardi, Pasquini, Cattaruzza, Gaetano, Baiva, et al. 2003	SG had higher alexithymia scores and alexithymia scores were more frequently above the clinical cut-off than the control group; regression found SG were associated with high alexithymic traits.	SG had higher level and rate of avoidant attachment than control group, no significant differences in anxious attachment.		
Picardi, Pasquini, Cattaruzza, Gaetano, Melchi et al., 2003	SG had higher alexithymia scores (overall, EOT and DIF), and scores were more frequently above clinical cut-off than the control group; regression found alexithymia and borderline alexithymia significantly more likely in SG.	Higher frequency of insecure attachments in SG, with higher anxious attachment and trend toward higher avoidant attachment; regression found anxious attachment significantly more likely in SG.		

Notes: SG=somatisation group; SCL-90-R=Symptom Checklist-Revised; ppts=participants; DDF=Difficulty Describing Feelings subscale of TAS; DIF= Difficulty Identifying Feelings subscale of TAS; EOT=Externally Oriented Thinking subscale.

Table 3 c. *Summary of Results*

<b>Author and year</b>	<b>Alexithymia and Somatisation</b>	<b>Insecure Attachment and Somatisation</b>	<b>Insecure Attachment and Alexithymia</b>	<b>Other Relevant Factors</b>
Picardi et al., 2005	SG had higher level of alexithymia, and were more likely to be classified as alexithymic than controls.	Avoidant attachment scores higher for SG, no differences for anxious attachment.		SG had lower level of perceived social support than controls, no significant differences in total number of stressful life events.
Solano et al., 2000	No significant differences between SG and group with psychosis in alexithymia scores, but high level of alexithymia overall (both groups scored above the cut-off and above the non-clinical mean).	High proportion of ppts in SG with avoidant attachment pattern (85%), high proportion of ppts in psychosis group with ambivalent pattern (55%).		No significant between group differences on closeness-to-parents total, but total scores were lower than non-clinical mean; psychosis group reported less closeness to mother than SG, SG reported less closeness to father than group with psychosis.

Notes: SG=somatisation group; ppts=participants; FAQ=Family Attitude Questionnaire.

**Alexithymia and somatisation.** Nine out of the ten included studies looked at relationships between alexithymia and somatisation (all except Koelen et al., 2015). The studies analysed the relationships between these two variables in a range of different ways.

Seven studies compared the level and/or prevalence of alexithymia between the somatisation group and the control group, and six of them found significant differences, with more alexithymia in the somatisation group (Barbosa et al., 2011; Bengtsson et al., 2013; Brown et al., 2013; Picardi et al., 2005; Picardi, Pasquini, Cattaruzza, Gaetano, Baliva, Melchi, Papi, et al., 2003; Picardi, Pasquini, Cattaruzza, Gaetano, Melchi, et al., 2003). The one study that did not find a between-group difference was Solano et al. (2000), where the control group was made up of people with psychosis. In this study, both groups were found to have high levels of alexithymia, and both groups scored above the clinical cut-off on the TAS-20.

In addition, all six of the studies that carried out correlations or regressions between alexithymia and either symptom reporting or dissociation found significant relationships (Barbasio & Granieri, 2013; Barbosa et al., 2011; Gil et al., 2008; Picardi et al., 2005; Picardi, Pasquini, Cattaruzza, Gaetano, Melchi, et al., 2003). Two studies also assessed whether the somatisation group was composed of different subgroups (Barbosa et al., 2011; Brown et al., 2013). Both of these studies identified two subgroups – one with higher levels of alexithymia and one with lower levels of alexithymia. In both cases, the subgroup with a higher level of alexithymia also had a higher level of symptom reporting. The higher alexithymia subgroups were also found to have higher levels of emotional dysregulation (Brown et al., 2013) and psychopathology (Gil et al., 2008).

**Insecure attachment styles and somatisation.** Eight of the studies explored relationships between insecure attachment styles and membership in the somatisation group or symptom reporting. Overall, the results suggested that people in the somatisation groups had high rates and/or high levels of certain insecure attachment styles.

Three studies reported high levels of attachment insecurity and/or high prevalence rates of insecure attachment styles in the somatisation groups (Barbasio & Granieri, 2013; Gil et al., 2008; Solano et al., 2000). In addition, six studies found differences between the somatisation group and the control group for level of attachment insecurity and/or prevalence rates of particular types of insecure attachment styles (Barbasio & Granieri, 2013; Bengtsson et al., 2013; Picardi et al., 2005; Picardi, Pasquini, Cattaruzza, Gaetano, Baliva, Melchi, Papi, et al., 2003; Picardi, Pasquini, Cattaruzza, Gaetano, Melchi, et al., 2003; Solano et al., 2000). One additional study (Brown et al., 2013) found that the subgroup of people in the somatisation group who had a trend toward more attachment insecurity (as well as high alexithymia) did have a higher level of symptom reporting.

Looking more carefully at the attachment results, some of the studies suggest higher levels of particular insecure attachment styles but not others. In particular, one study found higher levels of anxious attachment in the somatisation group than in the control group with no differences in levels of avoidant attachment (Bengtsson et al., 2013). Another study found the same pattern of higher levels of anxious attachment in the somatisation group, but there was a trend toward the somatisation group also having higher levels of avoidant attachment that did not reach significance (Picardi, Pasquini, Cattaruzza, Gaetano, Melchi, et al., 2003). On the other hand, two studies

found higher levels of avoidant attachment in the somatisation group than the control group, with no differences on anxious attachment (Picardi et al., 2005; Picardi, Pasquini, Cattaruzza, Gaetano, Baliva, Melchi, Papi, et al., 2003). One study (Solano et al., 2000) also found higher levels of avoidant attachment in people in the somatisation group, but this was compared with people who had been diagnosed with psychosis, who were found to have higher levels of ambivalent attachment styles.

**Insecure attachment and alexithymia results.** Only five studies assessed links between insecure attachment styles and alexithymia. Again, studies analysed the relationship between these two variables in a range of different ways.

Four studies assessed and found that attachment insecurity, or particular types of insecure attachment styles, correlated with or predicted alexithymia (Barbasio & Granieri, 2013; Barbosa et al., 2011; Gil et al., 2008; Koelen et al., 2015). Three of these studies explored the relationships between insecure attachment styles and different aspects of alexithymia in more detail. Specifically, Gil et al. (2008) found that both ambivalent clinging (i.e., anxious attachment) and ambivalent withdrawing (i.e., avoidant attachment) predicted the Difficulty Identifying Feelings (DIF) subscale score, but only the ambivalent clinging attachment style predicted overall scores on the alexithymia measure. Barbasio & Granieri. (2013) found that there was a significant main effect of attachment style on the overall alexithymia score and the DIF subscale scores. Koelen et al. (2015) found that insecure attachment strategies significantly added to the prediction of cognitive alexithymia but not affective alexithymia (in a model with negative affectivity and personality pathology already included).

However, affective alexithymia was already very strongly predicted by negative affectivity.

In addition, Brown et al. (2013) assessed whether there were differences in attachment insecurity between the high alexithymia and the lower alexithymia subgroups of the somatisation group. They found that there was a trend toward higher levels of insecure attachment in the subgroup with a high level of alexithymia than the subgroup with lower levels of alexithymia, although this trend did not reach significance.

### **Other Relevant Factors**

Many studies also included additional related factors in their analyses. These included self-esteem, emotional dysregulation, negative affect, stressful life events, social support, and closeness to parents. Interestingly, all of these factors could also relate to early life adversity, as well as to attachment styles and alexithymia. In most studies, significant differences between the somatisation group and the control group were found for these additional factors. These results will be summarised briefly.

One study found that the participants in the somatisation group had lower levels of self-esteem (Bengtsson et al., 2013). Another study found that they had higher levels of emotional dysregulation (Brown et al., 2013). In addition, a cohort study found that their participants (all in the somatisation group) had a high level of general psychiatric symptomatology, and this was a significant predictor of high alexithymia (Gil et al., 2008). The same study also found that participants (all in the somatisation group) had a high rate of psychiatric comorbidity but only low to moderate levels of self-reported anxiety and depression. Negative affectivity significantly predicted affective alexithymia, and

was borderline significant for predicting cognitive alexithymia (Koelen et al., 2015). Three studies explored numbers of recent stressful, undesirable, or major events, and interestingly, they did not find differences between the somatisation group and the control group on these factors (Picardi et al., 2005; Picardi, Pasquini, Cattaruzza, Gaetano, Baliva, Melchi, Papi, et al., 2003; Picardi, Pasquini, Cattaruzza, Gaetano, Melchi, et al., 2003). However, one of these studies did find that people in the somatisation group were more likely to experience three or more uncontrollable events within the past year (Picardi, Pasquini, Cattaruzza, Gaetano, Melchi, et al., 2003), and two of the studies found that people in the somatisation group reported less perceived social support than controls (Picardi et al., 2005; Picardi, Pasquini, Cattaruzza, Gaetano, Melchi, et al., 2003). The other study that measured these factors (Picardi, Pasquini, Cattaruzza, Gaetano, Baliva, Melchi, Papi, et al., 2003) did not find a difference in perceived social support, and actually found that the control group reported more uncontrollable events than people in the somatisation group. These results suggest that these variables are worth considering, particularly given that they could also relate to early life adversity, attachment styles, and alexithymia. However, with each study assessing different factors, it is difficult to draw any firm conclusions from the results.

## **Discussion**

Consistent with developmental theories (e.g., Cassidy, 1994; Waller & Scheidt, 2006), the results of this literature review provide evidence for links between attachment insecurity, alexithymia, and somatisation. As expected, attachment insecurity and alexithymia did seem to co-occur and be related to one another, which is consistent with the idea that they could arise from similar

kinds of experiences. However, this review adds an important caveat to those theories, highlighting the fact that these relationships are not as straightforward as the theories might suggest, and these variables are unlikely to influence everyone in the same ways. For example, alexithymia might only be relevant to a sub-group of people with somatisation related symptoms, and people with different types of insecure attachment styles might present to services in different ways.

The studies in this review also found relationships between somatisation and other factors, including negative affect, low self-esteem, emotional regulation difficulties, and dissociation, which can also result from early life adversity. Therefore, attachment insecurity and alexithymia are likely two of many relevant, and potentially interacting, factors that could serve as mediators between early life adversity and somatisation. Although the complexity of the relationships between attachment insecurity, alexithymia, and somatisation (as summarised in this review) makes them less straight-forward to understand, it might also help to explain why early life adversity is a risk factor for, but not necessary for, the development of somatisation (e.g., see Brown & Reuber, 2016).

### **Clinical Recommendations/Implications**

This review highlights the prevalence of attachment insecurity and alexithymia in people presenting with symptoms related to somatisation. Therefore, it is important to consider these, and other psychosocial factors, when working clinically with people who report physical symptoms, particularly when working in settings that are more dominated by medical models of pathology.

Although clients in physical health settings are not directly seeking help for their emotional distress or interpersonal relationships, their attachment styles could influence how they respond to their symptoms – for example, by seeking or avoiding medical advice. People’s attachment styles could also influence how they respond to healthcare workers, and to the advice and care they are offered. Therefore, it would be helpful for healthcare workers to have an understanding of attachment styles so that they are more able to recognise and respond to individual clients’ needs in ways that are therapeutic and do not exacerbate clients’ distress further. Clinical psychologists could helpfully provide supervision and training about attachment styles to other members of multi-disciplinary teams (MDTs), as well as potentially offering more individualised interventions for the clients. For the staff training, as well as for individual interventions, it could be helpful to draw on psychological models that focus on interpersonal relationships to explicitly identify the impact of attachment insecurity.

The prevalence of alexithymia in the somatisation groups highlights the fact that many people presenting with physical health symptoms might actually be experiencing physiological arousal in response to emotional triggers, without recognition of their emotional experiences. Clinical psychologists could play an important role in ensuring that clients are routinely provided with psychoeducation about the physiological symptoms associated with emotional distress (e.g., heart palpitations and stomach upset in response to anxiety), either through providing training to the medical MDT members who could share the information with clients, designing leaflets, or offering psychoeducation as an intervention in individual and group settings.

More public awareness of the links between emotional and physiological arousal would also be helpful, and clinical psychologists could potentially contribute to public health campaigns and school psychoeducation programmes. In addition, when working as clinical psychologists in any mental health or physical health settings, it can be easy to assume that clients have a reasonable level of understanding of their emotions. This review shows how prevalent alexithymia is, even in the control groups. Therefore, spending more time assessing and developing clients' emotional awareness and understanding could be helpful in facilitating effective recoveries.

### **Limitations**

As highlighted by the quality appraisal and noted by many of the studies individually, this literature review and the papers within it, have a number of limitations. Firstly, there were a limited number of studies that met the inclusion criteria for the review, and the quality of those studies was variable. As many of the authors pointed out, their studies contained small numbers of participants and were cross-sectional so could not test causality. There were also issues with recruitment methods that could have led to response bias. In addition, the majority of studies used only self-report questionnaires, and it is difficult to know how accurate these are, particularly when asking people who might have difficulties with emotional awareness about their emotions. However, it is not clear whether there are any more reliable methods for assessing this. One possibility for future research would be to include specific questionnaires that measure response bias (although these also clearly have limitations) or to include a mixture of self-report and experimental measures.

In addition, of the ten studies that were included, two were cohort studies, so they did not include a control group (Gil et al., 2008; Koelen et al., 2015), and three of the case-control studies had the same first author and included the same set of measures (Picardi et al., 2005; Picardi, Pasquini, Cattaruzza, Gaetano, Baliva, Melchi, Papi, et al., 2003; Picardi, Pasquini, Cattaruzza, Gaetano, Melchi, et al., 2003). All of the studies also had different goals, and so they did not all report the comparisons that we were interested in, making the results of this review less robust. The majority of studies also failed to provide sufficient information for effect sizes to be calculated. Without effect sizes, it was not possible to consider the magnitude of group differences or the size of relationships between variables.

Another limitation of this review was that the aetiologies of the symptoms and conditions included in this review were mixed. Therefore, although the somatisation groups all included participants with symptoms where stress/emotional factors were thought to be relevant, some of the participants' symptoms were at least partially explained by pathophysiological causes. Although it might have been better to exclude presentations including organic disease to focus on a more homogenous group of participants, it is encouraging to see that the findings were generally consistent across the studies, regardless of participants' specific diagnosis.

In addition, the selection criteria for control groups varied widely across studies, with the majority of control groups selected to either have physical symptoms related to a clear medical cause, or to have no known medical or somatisation symptoms. Only one of the studies included a control group with other a different mental health diagnosis. Although in some ways, the inclusion of a group with psychosis might be too closely related to the somatisation

group, research comparing somatisation groups to control groups who do have mental health difficulties could also be very interesting. This would allow assessment of whether factors such as attachment insecurity and alexithymia are particularly relevant to somatisation, or whether they are present more broadly in people with psychopathology.

In terms of the methods used in this review, it would have been helpful to have a second rater complete the quality appraisal. This is particularly important because several of the questions in the quality appraisal checklist are open to a degree of subjective interpretation, and so including a second rater could have improved its validity. In addition, the search terms used could have been broader, including different ways of searching for difficulties related to attachment insecurity and alexithymia to allow for a broader range of research to be identified. In addition, the inclusion and exclusion criteria could have been more clearly defined.

### **Future research**

This literature review highlights some important gaps in current understanding of somatisation. First of all, it shows that only a small number of studies have included all three components that were the focus of this review. Therefore, it would be useful to include measures of both attachment and alexithymia in more future studies of somatisation. In addition, only five studies in this review actually included a measure of symptom reporting or dissociation (and one of these studies did not report how symptom reporting related to the other variables). Therefore, it was only possible to directly assess the links between alexithymia, attachment, and somatisation in four studies. Future

studies should include all three variables to begin building up an understanding of the relationships between them.

Given the strong associations between trauma and somatisation (e.g., Brown et al., 2005; Nijenhuis, 2001; van der Kolk, Pelcovitz, Roth, Mandel, McFarlane, & Herman, 1996), and between trauma and the other factors in this review, it was surprising that none of the studies included measures of early life adversity. Therefore, it would be useful for future research to include a measure of early life trauma as well as the other three variables of interest. In addition, it is interesting to note that the studies that did include measures of recent stressful life events did not tend to find significant differences between the somatisation group and the control group. Therefore, this review raises questions about whether the developmental timing/recency of trauma is important. The results of this review could suggest that recent trauma is not as strongly associated with somatisation as trauma experienced earlier in development, or it is possible that recent trauma is more relevant in the presence of a previous history of traumatising. However, further research is needed to explore this further.

All of this research would likely benefit from including large samples. Including larger samples not only makes the findings more robust, but it would also allow more in-depth analysis of predisposing and precipitating factors for different subgroups of people with somatisation. In addition, it would be very useful to understand more about historical, or predisposing factors for somatisation and more recent, perhaps precipitating, factors for somatisation. In order to accomplish this, longitudinal designs would ideally be used, but as a starting point, people could be asked about their experiences during different developmental stages.

Finally, none of the studies included in this review, and indeed no studies that we are aware of, have considered protective factors that could make someone less likely to develop symptoms related to somatisation in the face of the same predisposing or precipitating experiences. For example, not everyone who experiences childhood trauma goes on to experience chronic conditions related to stress. In addition, many people experience physical symptoms that they do not know a pathophysiological cause for, for example, headaches, stomach aches, and heart palpitations. However, these symptoms do not become chronic for everyone, and it would be interesting to know why. Understanding more about protective factors could provide opportunities for prevention, or to inform therapeutic interventions for people who have already developed more chronic symptoms.

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## **Section Two: Research Report**

Initial Validation of the Lifespan Negative Experiences Scale (LiNES) and Assessment of its Relevance to Symptom Reporting in a Community Sample

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## Abstract

**Objectives.** The primary aim of the current study was to validate a new questionnaire, called the Lifespan Negative Experiences Scale (LiNES), which measures subjective experiences of trauma, affect, and relationship insecurity across the lifespan. Data from this study were also used to explore potential pathways between early experiences of trauma and current symptom reporting.

**Design.** Exploratory factor analysis of data from a non-clinical sample was used to identify subscales of the LiNES, and the data were then used to assess the reliability and validity of the LiNES. A mediation analysis was also carried out.

**Methods.** Participants from a non-clinical sample were recruited to complete the new measure and several previously validated questionnaires. Data were analysed to assess the reliability and validity of the LiNES and to test whether the LiNES predicted potentially relevant variables. A mediation analysis explored whether relationship insecurity and/or alexithymia mediated the relationship between childhood trauma and current symptom reporting.

**Results.** The LiNES appears to be a valid and reliable measure of experiences of interpersonal trauma, negative affect, and relationship insecurity. The LiNES predicted physical symptom reporting and emotional regulation difficulties in this sample, with the timing of experiences seeming to play an important role.

Alexithymia was found to partially mediate the relationship between childhood interpersonal trauma and symptom reporting.

**Conclusions.** The LiNES is a brief new measure of three types of adverse experiences that asks about childhood, adolescence, and adulthood. In a non-clinical sample, the LiNES predicted variables that are associated with functional symptoms.

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### **Practitioner Points**

- The LiNES is a brief new questionnaire. It was found to be a valid and reliable measure of negative experiences of interpersonal trauma, negative affect, and relationship insecurity in a non-clinical sample asking about experiences from three developmental stages.
- The LiNES predicted scores on measures of emotional processing difficulties and physical symptom reporting in a community sample.
- Alexithymia could be an important mediating variable between early experiences of interpersonal trauma and current symptom reporting.

### **Limitations**

- The sample included in this study was not fully representative of the wider population, having been recruited via a university volunteers list. Participants tended to be young and more females than males took part. Therefore, the results should be interpreted with caution.
- This study did not include validation of the measure with a clinical sample, and so the measure will need further validation before it can be used clinically.

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## Introduction

Current estimates suggest that up to 20-50%, of people attending medical appointments have symptoms that could be considered functional (e.g., Carson, Ringbauer, Stone, McKenzie, Warlow, & Sharpe, 2000; Konnopka et al., 2012; Nimnuan, Hotopf, & Wessely, 2001) – in other words, physical symptoms that are not clearly attributable to structural or pathophysiological explanations (American Psychiatric Association, 2013; Reuber, Mitchell, Howlett, Crimlisk, & Grunewald, 2005; Stone, 2002). In addition to being distressing for individuals, functional symptoms have been associated with low quality of life (Szaflarski et al., 2003) and high healthcare costs (see Konnopka et al., 2012 for a review). In other words, functional symptoms are prevalent, and they have negative consequences for both individuals and the healthcare system as a whole.

Existing models of functional symptoms suggest that psychosocial factors, including negative life experiences of trauma, negative affect, and relationship insecurity could play important roles (e.g., Brown & Reuber, 2016; Brown, 2006; Wearden, Lambertson, Crook, & Walsh, 2005). For example, childhood trauma – and particularly childhood interpersonal trauma (e.g., Landa, Bossis, Boylan, & Wong, 2012; Landa, Peterson, & Fallon, 2012) – has been associated with functional symptoms in a number of studies (e.g., Brown, Schrag, & Trimble, 2005; Fiszman, Alves-Leon, Nunes, D'Andrea, & Figueira, 2004; Kaplan Dwivedi, Privitera, Isaacs, Hughes, & Bowman., 2013; Sharpe & Faye, 2006; van der Kolk, Pelcovitz, Roth, Mandel, McFarlane, & Herman, 1996). Trauma is theorised to lead to functional symptoms through fragmentation of memories, attentional biases, defensive psychological processes, or a mixture of biopsychosocial factors (see Brown, 2004 for an

overview). In addition, functional symptoms are widely thought to be physical manifestations of emotional distress (Reuber et al., 2005). Therefore, negative affect (e.g., anxiety and depression) is thought to be risk factor for functional symptoms, and even when people do not meet the diagnostic criteria for any psychiatric disorder, their functional symptoms are often attributed to psychological factors (Brown, 2004). Insecure attachment styles have also been associated with functional symptoms, and could influence peoples' help-seeking behaviours. For example, having an insecure avoidant attachment style (Ainsworth, Blehar, Waters, & Wall, 1978) could make people more prone to avoid medical care, thus becoming more isolated and anxious until problems become unmanageable. Alternatively, having an insecure anxious attachment style could make people more likely to amplify their distress and over-report common physical symptoms (Taylor, Marshall, Mann, & Goldberg, 2012; Wearden et al., 2005).

### **Clinical Need for a Lifespan Negative Experiences Scale**

Given that each of these three types of negative life experiences – trauma, negative affect, and relationship insecurity – have been associated with functional symptoms, it is clinically important to consider these factors when people present to services, and when considering potential clinical interventions. However, it is not always clear which, if any, of these factors are relevant for a given individual, and medical appointments tend to be very brief, minimising opportunities for more in-depth psychological assessment. In addition, existing measures of trauma, affect, and relationship insecurity were not designed with functional symptoms in mind, or for use in busy medical outpatient settings.

On a practical level, these measures tend to be long and time-consuming, with no combined measures of trauma, negative affect, and relationship insecurity in existence. In addition, existing trauma questionnaires tend to ask very specific questions about sensitive topics, which make them difficult to use routinely without already having an established therapeutic relationship with the client. Most existing trauma questionnaires also attempt to measure trauma objectively (e.g., number of experiences, number of perpetrators), but there is some evidence to suggest that some people experience higher levels of distress in relation to the same objective experiences (Testa, Krauss, Lesser, & Brandt, 2012). Therefore, it might be more appropriate to measure trauma as subjectively as possible, for example by asking how much someone has experienced a particular type of trauma rather than asking about the numbers of traumatic experiences or perpetrators.

Finally, existing measures of trauma, negative affect, and relationship insecurity all fail to cover the entire lifespan, only asking either about childhood experiences or current experiences, thus only providing information about one small part of a person's developmental history. However, the timing of negative experiences is likely to be important to an individual's emotional development given the variable levels of biopsychosocial developmental vulnerability in different phases of life (Gee & Casey, 2015; Kaufman, Plotsky, Nemeroff, & Charney, 2000; Romeo, 2013). In addition, given the potential interactions between trauma, negative affect, and relationship insecurity, knowing when these experiences occurred would be useful for developing broader formulations. For example, in some cases, experiences of childhood trauma could interfere with the development of secure relationships later in life. However, this will not be the case for everyone.

Due to all of these limitations of existing measures, it would be very helpful to have a new questionnaire that could serve as a brief screening tool to assess experiences of trauma, negative affect, and relationship insecurity that would be appropriate for use in medical settings. It would also be useful for this questionnaire to be as subjective as possible and to provide information about the developmental timing of experiences.

### **Relationships between Psychosocial Factors and Symptom Reporting**

Although early life interpersonal trauma has often been associated with functional symptoms (e.g., Brown, Schrag, & Trimble, 2005; Fiszman, Alves-Leon, Nunes, D'Andrea, & Figueira, 2004; Sharpe & Faye, 2006; van der Kolk et al., 1996), it is not clear whether trauma directly influences the reporting of functional symptoms, or whether the pathways might be more indirect. For example, early life trauma/neglect could interfere with the development of secure relationships later in life, and in turn, influence the ways in which people seek support for their physical and emotional distress (Taylor, Marshall, Mann, & Goldberg, 2012; Wearden Lambertson, Crook, & Walsh, 2005), making them more vulnerable to functional symptoms (Kaplan et al., 2013; Landa, Bossis, Boylan, & Wong, 2012; Waldinger, Schulz, Barsky, & Ahern, 2006). In addition, early life trauma/neglect could also lead to delayed or impaired emotional processing abilities (Aust, Haertwig, Heuser, & Bajbouj, 2013; Harris, 1999; Lemche, Klann-Delius, Koch, & Joraschky, 2004). In particular, the emotional processing difficulty of alexithymia is defined as difficulty experiencing, identifying, and describing emotions (Nemiah, Freyberger, & Sifneos, 1976), and alexithymia has been associated with functional symptoms (see De Gucht & Heiser, 2003 for a review). Therefore, there are growing theories that

attachment insecurity or alexithymia could mediate the relationship between early experiences of trauma and current functional symptoms (e.g., Holman, Kirkby, Duncan, & Brown, 2008; Landa, Bossis et al., 2012). However, there is a lack of research in this area, and further exploration is needed to develop our theoretical understanding of potential mechanisms driving functional symptoms.

### **Study Aims and Overview**

This study seeks to address both of these key issues - firstly the need for a new measure to identify relevant psychosocial factors at a more individualised level, and secondly, the need to explore relationships between psychosocial factors and symptom reporting. These two overarching aims have been broken down into three more detailed stages. Briefly, those stages are: 1) refinement of a new questionnaire called the Lifespan Negative Experiences Scale (LiNES), 2) validation of the LiNES (which will also include exploring differences in LiNES subscale scores across the lifespan), and 3) exploring a potential pathway from trauma to symptom reporting. All of the stages will be described in more detail in the Method section below.

However, it is very important to be clear that this study only includes participants from a non-clinical sample. Therefore, a distinction is made between the term functional symptoms (defined above) and the term 'symptom reporting', which is used in this study to refer to the reporting of symptoms (on a somatic dissociation questionnaire) without regard to whether their causes are known. Although this distinction is an important one, there is an inverse relationship between the number of symptoms reported on somatic dissociation questionnaires and the likelihood of identifying a medical disease or physical cause of those symptoms (Carson et al., 2000). Therefore, high scores on the

somatic dissociation questionnaire likely relate to symptoms that could be termed functional, and therefore symptom reporting was used as one of the preliminary checks of this study's clinical relevance.

## **Method**

### **Overview**

This thesis describes the creation and initial validation of the LiNES, an initial assessment of its potential clinical relevance, and a mediation analysis aimed at extending our current understanding of the relationship between early life trauma and current symptom reporting. Data were collected from a non-clinical sample, using online survey software ("Qualtrics," 2015). The methods for this initial validation are explained in detail below, including the development of LiNES, a description of the other measures used in the study, the participants, and how the data were analysed. Ethical approval for the project was granted by the University of Sheffield Ethics Committee (Appendix A).

### **LiNES Development**

**Item generation.** Items for each subscale of the LiNES were developed by reading existing literature about trauma, affect, and relationship insecurity, then considering how to assess these factors in a way fitting with the goals of this study. Both supervisors independently generated some of the items based on their background knowledge, and the author then added items after reading background literature about functional symptoms. The guidance in Kline (2000) was also considered.

In order to make items as subjective as possible, each item was worded to ask 'to what extent did you experience \_\_\_?' or 'to what extent did you feel

\_\_\_?’ rather than asking about numbers of perpetrators or number of times. This also fit with the aim of making the questionnaire as acceptable for use in busy outpatient settings as possible. To accomplish this, questions were worded to be as general as possible. For example, within the trauma measure, rather than asking specific details about whether the participant was yelled at or insulted, the item was phrased to ask about emotional abuse generally. In addition, the specific settings (e.g., home) and types of relationships (e.g., parents or romantic partner) were not specified. Questions were also phrased so that they could be used to ask about different life stages. The original LiNES items are shown in Appendix B.

**Service user involvement.** Service user feedback about the acceptability and feasibility of the LiNES was obtained by meeting with eight client volunteers attending an outpatient neurology clinic at the Royal Hallamshire Hospital in August 2014. These participants included people with a diagnosis of epilepsy and/or non-epileptic seizures. All eight participants found the questions acceptable, although one item (feeling ‘unlovable’) was removed from the relationship insecurity subscale as several participants found it unclear.

## **Procedure**

After the LiNES had been created and service user feedback had been incorporated, the Participant Information Sheet (see Appendix C), Consent Form (see Appendix D), measures (see below), and debriefing information (see Appendix E) were entered into the online survey software, Qualtrics (“Qualtrics,” 2015). All measures were self-report, and copyright information was checked for all of the measures before recruitment began. All of the surveys were available for research use free of charge. For the Emotional Processing Scale (described

below), permission to use the measure online was sought from the team who developed the questionnaire (see Appendix F). All data was collected through the online questionnaires.

**Recruitment.** Potential participants were recruited via e-mail through a volunteer database (see Appendix G for e-mail), which included all current students at the University of Sheffield as well as alumni and staff who had agreed to be contacted about research participation opportunities. Participants were informed that, if they chose to participate, they could either take part on one occasion (Time 1: T1) or provide their e-mail address to be contacted about an additional follow-up study (Time 2: T2). They were informed that their participation was voluntary (see Appendix D for Participant Information Sheet), and they were offered the chance to be entered into a prize draw for a £20 Amazon voucher for participating at T1 and a separate prize draw for another £20 Amazon voucher for participating again at T2. In addition, to recruit more participants and increase the diversity of participants, a snowballing technique was used, and everyone who took part in the study was asked to share the survey link with at least one person who was not affiliated with the university.

## **Measures**

**Demographics.** Participants were asked to provide their date of birth, then to answer multiple-choice questions about gender, country where they grew up, and ethnicity (Appendix H). Categories for ethnicity were based on suggestions from the Office of National Statistics (“Office for National Statistics,” n.d.). Participants were also asked to provide information about any relevant conditions (which they chose from a set of options), their primary caregivers from when they were children, and subjective socio-economic status.

*Relevant conditions.* Because emotional processing was an important factor in this study, participants were asked whether they had been diagnosed with any conditions that could be relevant. These included having a diagnosis of Anxiety, Depression, Post-Traumatic Stress Disorder (PTSD), other mental health conditions, Epilepsy, other seizure disorder, Autism Spectrum Disorder (ASD), other developmental conditions, Chronic Pain / Myalgic Encephalomyelitis / Irritable Bowel Syndrome, Medically Unexplained Symptoms (MUS) or none of the above.

*Primary caregivers.* Participants were asked to select all of the people they considered to be their primary caregivers from a list (including father, mother, grandfather, grandmother, uncle, aunt, other family member, and other). This item was included because it could be relevant to attachment/experiences of relationships.

*Socio-Economic Status Ladder.* Participants were asked to rate their socio-economic status (SES) using the SES ladder (Adler, Epel, Castellazzo, & Ickovics, 2000: shown in Appendix I). The SES Ladder asks participants to rate SES on a 1-10 scale, with 1 indicating low SES and 10 indicating high SES. The SES Ladder suggests that people base their ratings on amount of money, level of schooling, and whether jobs held are the most or least respected by the community. Therefore, this is a subjective measure, which could introduce bias, but could also provide a more accurate sense of how participants viewed themselves. Participants were asked to complete the SES Ladder on the basis of two different time points – once for their family when they were growing up and once for their current circumstances.

**Original LiNES.** In its original form, the LiNES consisted of 32 items (see Appendix C). These items were grouped into three subscales based on what

they were intended to measure (i.e., experiences of trauma, affect, and relationship insecurity). For the trauma subscale, participants were asked to rate the extent to which they had *experienced* something (e.g., illness, stress, physical abuse), and for the affect and relationship insecurity subscales, participants were asked to rate the extent to which they had *felt* something (e.g., happy, confident, secure). Each item was rated on a seven point scale of 0 (not at all) to 6 (a lot). They were asked to rate all 32 items three times – first in relation to experiences during childhood, then experiences during adolescence, and finally, experiences during adulthood.

**Validation measures.** Three previously validated measures were chosen to test the construct validity of each of the three LiNES subscales (shown in Appendix J). Therefore, one measure relevant to experiences of trauma was chosen, one measure relevant to experiences of affect was chosen, and one measure relevant to experiences in relationship/attachment insecurity was chosen. These measures are described below.

*Childhood Abuse and Trauma Scale (CATS).* The CATS (Sanders & Becker-Lausen, 1995) was selected as a measure of trauma. It has good psychometric properties, including an overall Cronbach's alpha of 0.90 (Kent & Waller, 1998; Sanders & Becker-Lausen, 1995) and is widely used as a measure of childhood trauma. The CATS contains 38 items, each rated on a 0 (never) to 4 (always) scale. In line with the instructions for users, some items were reverse scored. The original paper describes three subscales: 1) sexual abuse; 2) punishment; and 3) neglect/negative home atmosphere. An additional emotional abuse subscale was created and validated by Kent and Waller (1998) using items which were not included in the original three subscales.

*Positive and Negative Affect Scale (PANAS).* The PANAS (Watson, Clark, & Tellegen, 1988) was selected as a measure of affect. It has good psychometric properties (negative affect subscale Cronbach's  $\alpha=0.85$ , positive affect subscale Cronbach's  $\alpha=0.89$ ), and it contains 20 items, each rated on a 1 (very slightly or not at all) to 5 (extremely) scale. The 20 items are divided into two subscales – a negative affect and a positive affect subscale, each composed of 10 items. This measure has been used to ask about a range of time periods (e.g., this moment, today, the past week, the past year, in general: Watson et al., 1988). For the purposes of the current study, the question was worded to ask about positive and negative affect during the past week.

*Relationship Scales Questionnaire (RSQ).* The RSQ was selected as a measure of attachment/experiences in relationships (Griffin & Bartholomew, 1994). It contains 30 short statements, which were compiled from three separate measures. For each item, participants are asked to rate how closely the statement matches their characteristic style in close relationships. The measure can be scored in different ways depending on the purpose of the study. However, the authors (Griffin & Bartholomew, 1994) suggest scoring the items to derive two attachment dimensions of anxiety and avoidance using the method described in Kurdek (Kurdek, 2002), and this was the method used in the present study. The RSQ was selected because it has good psychometric properties (anxiety Cronbach's  $\alpha=0.83$ , avoidance Cronbach's  $\alpha=0.77$ : Kurdek, 2002), it has been widely used, and it has good clinical validity. In addition, it does not ask about any particular type of relationship (e.g., with parents or romantic partners).

**Relevant symptom measures.** At T2, two additional questionnaires were included to measure symptom reporting and emotional processing difficulties. These were chosen to measure symptoms that are particularly relevant to functional symptoms, but that could also be relevant to clients with other mental health difficulties.

*Somatiform Dissociation Questionnaire (SDQ).* The SDQ-20 (Nijenjuis, Spinhoven, Van Dyck, Der Hart, & Vanderlinden, 1996) was selected as a measure of symptom reporting (Appendix K). It lists 20 physical symptom experiences that can sometimes be observed without medical explanation. Participants are asked to rate each item on a five point scale from "1 = this applies to me NOT AT ALL" to "5 = this applies to me EXTREMELY". They are then asked whether a physician has connected the symptom or bodily experience with a physical cause. For research purposes, the authors suggest not adjusting scoring on the basis of whether a physical cause is known (Nijenjuis, 2003). However, there is some evidence that higher symptom counts on are associated with the symptoms not having identifiable pathophysiological explanations (Carson et al., 2000). The SDQ-20 score is calculated by summing the individual item scores. This measure has been found to have good psychometric characteristics (Cronbach's alpha=0.95: Nijenjuis et al., 1996), and it has been used in multiple countries (see Nijenjuis, 2003).

*Emotional Processing Scale (EPS-25).* The EPS-25 (Baker et al., 2010) was chosen as a measure of emotional processing difficulties. The EPS-25 is not shown in an appendix because of copyright restrictions. However, it contains 25 items (derived from a longer 38-item measure: Baker, Thomas, Thomas, & Owens, 2007), and it was designed to measure emotional processing styles and deficits. It has good psychometric properties (Cronbach's

alpha=0.92: Baker et al., 2010). Participants are asked to rate each statement on a scale from 0 (completely disagree) to 9 (completely agree). Five subscale scores can be generated, each containing five items. These subscales relate to suppression, unregulated emotion, impoverished emotional experience, signs of unprocessed emotions, and avoidance. This measure has been found to have good psychometric properties and there is growing evidence for its clinical validity with a number of clinical groups. In addition, scores on the EPS – specifically the impoverished emotional experience subscale – have been found to correlate highly with the Toronto Alexithymia Scale (TAS-20: Parker, Taylor, & Bagby, 2003), and therefore serves as a measure of alexithymia (Baker et al., 2007; Novakova, Howlett, Baker, & Reuber, 2015).

## **Participants**

A total of 373 people opened the survey link, and 271 (194 females, 71.6%) completed demographic information and the LiNES at T1 (73% completion rate), suggesting that the majority of participants found it an acceptable measure. Participants who completed the measures ranged in age from 19 to 67 ( $M = 30.6$ ,  $SD = 12.6$ ). Participants all had to confirm that English was their first language, and the majority (241) said they grew up in the United Kingdom. People who said they were not from the United Kingdom reported growing up in a range of countries, most commonly other English speaking countries (e.g., Ireland, the United States, New Zealand) and a few non-English speaking countries. The majority of participants reported their ethnicity as White (240), followed by Mixed/Multiple (15), Asian / Asian British (10), Black / African / Caribbean / Black British (4), and 'Other' (2). The majority of participants identified both their mother and father as primary caregivers (215), some

identified one parent as a primary caregiver (53), and a few did not identify their mother or father as a primary caregiver (3). The majority of participants reported having one (39) or two primary caregivers (192), whilst some reported having three (24), four (13), or five or more (3) primary caregivers. Responses on the SES ladder suggested that participants identified themselves as coming from a range of SES backgrounds as children, with scores ranging from one to ten ( $M = 5.8$ ,  $SD = 1.9$ ). They also reported a range of current SES ratings, with scores ranging from two to ten ( $M = 6.1$ ,  $SD = 1.4$ ). Some participants said they had been diagnosed with at least one relevant condition (see Table 1). Of the 271 participants who completed the LiNES at T1, 267 also completed both of the other previously validated measures.

Table 1. *Percentage of participants reporting of relevant conditions*

	Anx	Dep	PTSD	Other MH	ASD	Other Dev	Epil	Other Seiz	CP/ME/ IBS	Other MUS	None
T1 (%)	19	24	2	4	1	2	1	1	7	1	63
T2 (%)	20	27	3	5	1	2	1	0	9	1	60

Note: T1=Time 1 participants, T2=Time 2 participants, Yes=participant reported this condition had been diagnosed, No=participant reported this condition had not been diagnosed, Anx=Anxiety, Dep=Depression, PTSD=Post Traumatic Stress Disorder, Other MH=Other Mental Health Condition, ASD=Autism Spectrum Disorder, Other Dev=Other Developmental Condition, Epil=Epilepsy, Other Seizure=Other Seizure Disorder, CP/ME/IBS=Chronic Pain/Myalgic Encephalomyelitis/Irritable Bowel Syndrome, MUS=Medically Unexplained Symptoms, None=None of the listed conditions.

At T2, 166 participants (127 females, 76.5%) completed all subscales of the LiNES a second time (for each of the three developmental stages) and the EPS-25. Of the 166 participants who completed the LiNES and EPS-25, 160 also completed the SDQ-20. For the 166 participants completing the LiNES at both T1 and T2, descriptive statistics were similar to those completing the

Table 2. Average scores for participants completing T1 only and those also completing T2

Age	SES		PANAS		RSQ		CATS			LINES											
	child	current	pos	neg	anx	avoid	neg	pun	sexual	emot	total	Child		Adoles		Adult					
	trauma	affect	attach	attach	trauma	affect	attach	attach	trauma	affect	attach	trauma	affect	attach	trauma	affect	attach				
T1 only (n=105)	29.4	5.77	6.15	30.65	21.94	2.28	3.11	0.84	1.50	0.11	0.97	0.77	0.28	1.98	1.62	0.29	2.95	2.14	0.26	3.02	1.88
T2 & T1 (n=166)	31.4	5.86	6.09	31.18	19.76	2.19	3.25	0.82	1.46	0.10	0.92	0.73	0.31	1.82	1.61	0.38	2.75	2.11	0.29	2.75	1.81
	p=.19	p=.73	p=.72	p=.59	p=.03	p=.48	p=.03	p=.80	p=.60	p=.91	p=.59	p=.56	p=.72	p=.35	p=.95	p=.38	p=.27	p=.86	p=.65	p=.13	p=.63

Note: T1=time 1, T2=time 2, n=number of participants in each group, SES=score on subjective SES ladder, child=childhood score, current=current score, PANAS=Positive and Negative Affect Scale, pos=positive subscale, neg=negative subscale, anx=anxious subscale, avoid=avoidant subscale, CATS=Childhood Abuse and Trauma Scale, neg=neglect/negative home atmosphere subscale, pun=punishment subscale, sexual=sexual abuse subscale, emot=emotional abuse subscale, total=total score, LINES=Lifetime Negative Experiences Scale, Child=childhood scores, Adoles=adolescence scores, Adult=adulthood scores.

measures only at T1. Participants ranged in age from 19 to 67 ( $M = 31.4$ ,  $SD = 12.4$ ). Their childhood ratings on the SES ladder ranged from two to ten ( $M = 5.9$ ,  $SD = 1.8$ ) and current ratings on the SES ladder ranged from two to nine ( $M = 6.1$ ,  $SD = 1.3$ ). These characteristics are very similar to those found in the group participating at T1 only. However, to check the representativeness of people who completed the LiNES at T2 compared to those who only completed the LiNES at T1, average scores for age and all of the T1 measures were calculated separately for these two groups (see Table 2). Independent samples t-tests were carried out, and after correcting for multiple comparisons (using Bonferroni-Holm), none of the differences were significant.

## **Analysis**

Data analysis took place in several stages. Stages one and two of the analysis were based on the framework suggested by Kline (2000) for developing measures. The first stage included refining the LiNES and assessing its internal reliability. The second stage assessed the validity of the final LiNES subscales, including exploring the potential clinical relevance of the LiNES and the utility of including multiple developmental stages. The third stage of analysis focused more on theoretical questions, and it explored whether relationship insecurity and/or alexithymia mediated the relationship between early life trauma and current symptom reporting.

For all measures, negatively keyed items were reverse scored prior to any data analysis. All data analysis was carried out using IBM SPSS Statistics (Version 22).

## **Stage 1 – Refinement of the LiNES.**

The first stage of analysis aimed to refine the LiNES and create subscales. This stage involved exploring the factor structure, removing items that did not correspond to the subscales, and assessing the internal reliability of each subscale.

**Principal Components Analysis.** Exploratory Principal Components Analysis (PCA) was used to explore and refine the underlying structure of the scale. Data were included from the participants who completed all of the 32 LiNES items for each developmental stage (childhood, adolescence, and adulthood) at T1 (n=271). This sample size provides a participants-to-items ratio of approximately 8.5:1. PCA was carried out separately for each developmental stage to avoid decreasing power. An oblique (Direct Oblimin) rotation was chosen because the components were hypothesised to be correlated (see Kline, 2000), and as expected, this was the best fit for the data. Initially, components with eigenvalues greater than one were retained, and the Monte Carlo method was used to confirm the appropriate number of components by comparing eigenvalues from the PCA of our data with eigenvalues from a set of randomly generated data (Ledesma & Valero-Mora, 2007; Watkins, 2000). Pattern matrices were then explored to identify relationships between the items and to remove items that did not correlate highly with the remaining components. In addition, after identifying the subscales, PCA was carried out again with the remaining items to check that the factor structure remained. Throughout the process of PCA, the face validity of the items and components were considered (Kline, 2000).

**Internal reliability of subscales.** Following PCA, the scores at T1 for each subscale (relating to interpersonal trauma, negative affect, and

relationship insecurity) were assessed for internal reliability. Cronbach's Alpha was calculated (n=271) for each subscale. A Cronbach's Alpha of 0.70 was considered acceptable (Kline, 2000).

**LiNES distribution of scores.** Prior to carrying out further analysis, subscale scores for the LiNES were calculated. Then, probability-probability (P-P) plots and histograms were plotted with distribution curves, and visual inspection of the plots was used to assess normality of the data (Field, 2013). Given the large sample size (n=271), parametric analyses were planned, but non-parametric analyses were also considered for comparison where scores were not normally distributed.

## **Stage 2 – reliability and validity of the LiNES**

The reliability and validity of the LiNES were assessed by looking at test-retest reliability, concurrent validity of the LiNES with other existing measures, and by exploring whether the LiNES (for different developmental stages) predicted potentially clinically relevant variables. As part of this, scores on the LiNES at different developmental stages were compared to one another.

**Test-retest reliability.** Scores at T1 and T2 for the 166 participants who completed all of the LiNES items at two time points (approximately two weeks apart) were compared to examine test-retest reliability. For each subscale and total score (at each developmental stage), correlation analyses (Pearson's correlation coefficient) and repeated measures t-tests were carried out to assess both correlations between T1 and T2 and also to determine whether there were any significant changes. Correlations of at least 0.7 were considered acceptable (Barker, Pistrang, & Elliot, 1994). Spearman's correlation coefficient and Wilcoxon Signed Rank tests were also used for non-parametric

comparisons. The Bonferroni-Holm correction for multiple comparisons was used. For any comparisons where the t-test was significant, an effect size was also calculated to determine the magnitude of the change (online calculator: Wiseheart, 2013). Cohen's interpretation of effect sizes was used to interpret the results (0.2 = small, 0.5 = medium, 0.8 = large: Cohen, 1988).

**Concurrent validity.** To test the concurrent validity of the LiNES, each subscale of the LiNES was correlated with an existing measure of each construct (i.e., trauma - CATS, affect - PANAS, relationship insecurity - RSQ) to assess concurrent validity (n=267 to 269, depending on completion of the other measures). Pearson's correlation coefficients were calculated, and Bonferroni-Holm was used to correct for multiple comparisons (Holm, 1979). Given there are no benchmark tests of trauma, affect, and relationship insecurity, concurrent validity was considered adequate if correlations were at least 0.75 (Kline, 2000).

**Comparing scores for different developmental stages.** Although participants' early experiences are likely to influence their experiences throughout their lives, an aim of the LiNES was to create a measure that captured experiences across the entire lifespan. Therefore, both to understand whether people's experiences of interpersonal trauma, negative affect, and relationship insecurity did change across the lifespan, and to determine whether it was worth including all three developmental stages in the final version of the LiNES, correlations between childhood, adolescence, and adulthood scores (for T1 only, n=271) were computed for each subscale. Repeated measures t-tests were also carried out (with Bonferroni-Holm used to correct for multiple comparisons), and similar to the test-retest reliability calculations, for any significant differences, an effect size was also calculated. Spearman's

correlation coefficient and Wilcoxon Signed Rank tests were carried out for non-parametric comparisons (Field, 2013).

**Prediction of potentially relevant symptoms.** To test whether the LiNES scores predicted emotional processing difficulties and symptom reporting, the LiNES subscale scores for interpersonal trauma, negative affect, and relationship insecurity were entered together as independent variables (IVs), with the SDQ-20 total score, the EPS-25 total score, and the EPS Impoverished Emotional Experience subscale (which is particularly associated with alexithymia: Baker et al., 2007) entered as dependent variables (DVs) in separate regression analysis (n=160 for SDQ regression and n=166 for EPS regression). This was done separately for each developmental stage to avoid high multicollinearity, and to explore whether the timing of negative events was relevant for current symptom reporting and emotional processing difficulties. Bonferroni-Holm corrections for multiple comparisons were carried out.

### **Stage 3 – Potential Pathways from Trauma to Symptom Reporting.**

To build on and extend the current literature about potential risk factors that could lead to increased symptom reporting, an additional analysis was undertaken. Specifically, a hierarchical regression analysis was carried out to test the possibility that adult experiences of relationship insecurity and alexithymia mediated the relationship between childhood experiences of interpersonal trauma and symptom reporting. Therefore, the childhood trauma subscale score from the LiNES was entered as an IV in step 1, with the adult relationship insecurity subscale score of the LiNES as an IV in step 2, and scores for five types of emotional processing styles (as measured by the EPS) entered as IVs in step 3. Symptom reporting (as measured by the SDQ) was

entered as the DV. As recommended by Preacher and Hayes (2008), a further mediation analysis was conducted to explore significant results.

## **Results**

As described above, data analysis took place in stages. The results from each stage will be summarised in turn.

### **Stage 1 - Refinement of the LiNES**

**Principal Components Analysis.** PCA was carried out for the 32-item version of the scale. For each of the three developmental stages (childhood, adolescence, and adulthood), Bartlett's test of sphericity indicated that the null hypothesis (of the variables being uncorrelated) could be confidently rejected ( $p < 0.001$ ). In addition, inspection of the correlation matrixes suggested that PCA was feasible, as a reasonable number of correlations exceeded 0.3 (Kline, 2000).

For childhood and adulthood, the PCA identified six components with eigenvalues exceeding 1.0. For adolescence, the PCA identified five components with eigenvalues exceeding 1.0. The slopes of the scree plots also suggested six component solutions for childhood and adulthood and a five component solution for adolescence. Therefore, a six component solution was originally chosen for childhood and adulthood and a five component solution was originally chosen for adolescence.

As expected, the pattern matrices from the Direct Oblimin rotation suggested the simplest component structure, with the majority of items loading on components 1, 2, and 3 at all three developmental stages. All items with loadings  $< 0.30$  (small effect size) were discarded, and components 4, 5, and 6

(where it existed) were discarded because each had fewer than three items remaining after this criterion had been applied. To prevent subscales measuring very similar constructs, the strongest factor loading needed to be >0.20 larger than the next largest factor loading (within factors 1-3). In cases where the factor loadings did not meet this criterion, the item was discarded. In addition, to create a consistent scale across all three developmental stages, items had to load most strongly onto the same component for childhood, adolescence, and adulthood and meet all of the above criteria. Any items that did not meet all of the above criteria consistently for each developmental stage were discarded.

This left a total of thirteen items and three principal components. This three-component solution with thirteen items accounted for at least 52% of the variance at each developmental stage (childhood: 53.8%, adolescence: 56.2%, adulthood: 52.3%). Tables 3a to 3c (below) show the pattern matrix results from each of these three PCAs. Subscale labels (experiences of interpersonal

Table 3a. Childhood

Item	Description	Components		
		I	II	III
<i>II</i>	<i>Trauma (<math>\alpha=0.73</math>)</i>			
5	Physical neglect	-.11	<b>.65</b>	-.16
6	Physical abuse	.14	<b>.77</b>	-.01
8	Emotional abuse	.09	<b>.61</b>	-.28
9	Sexual abuse	.04	<b>.53</b>	.01
<i>I</i>	<i>Affect (<math>\alpha=0.85</math>)</i>			
3	Angry	<b>.51</b>	.25	.10
4	Afraid	<b>.53</b>	.21	-.05
6	Stressed	<b>.75</b>	-.10	-.20
10	Worried	<b>.79</b>	-.08	-.09
11	Anxious	<b>.78</b>	-.13	-.12
<i>III</i>	<i>Relationship insecurity (<math>\alpha=0.85</math>)</i>			
1	Secure	.20	.11	<b>-.61</b>
3	Loved	-.08	.18	<b>-.79</b>
4	Confident	.18	-.14	<b>-.62</b>
6	Supported	-.10	.22	<b>-.82</b>
Eigenvalue		13.64	1.89	1.67
% of variance		46.64	5.90	5.23

Table 3b. Adolescence

Item	Description	Components		
		I	II	III
<i>II</i>	<i>Trauma (<math>\alpha=0.68</math>)</i>			
5	Physical neglect	-.13	<b>.71</b>	-.07
6	Physical abuse	.06	<b>.77</b>	-.07
8	Emotional abuse	.17	<b>.71</b>	-.09
9	Sexual abuse	.01	<b>.47</b>	.02
<i>I</i>	<i>Affect (<math>\alpha=0.87</math>)</i>			
3	Angry	<b>.51</b>	.12	-.02
4	Afraid	<b>.64</b>	.13	.03
6	Stressed	<b>.80</b>	-.05	-.07
10	Worried	<b>.85</b>	-.14	-.08
11	Anxious	<b>.80</b>	-.17	-.14
<i>III</i>	<i>Relationship insecurity (<math>\alpha=0.85</math>)</i>			
1	Secure	.22	.14	<b>-.52</b>
3	Loved	-.14	.26	<b>-.77</b>
4	Confident	.06	-.12	<b>-.80</b>
6	Supported	-.13	.33	<b>-.66</b>
Eigenvalue		13.69	2.35	1.94
% of variance		42.77	7.34	6.06

Table 3c. Adulthood

Item	Description	Components		
		I	II	III
<i>II</i>	<i>Trauma (<math>\alpha=0.70</math>)</i>			
5	Physical neglect	.04	<b>.38</b>	.11
6	Physical abuse	-.04	<b>.88</b>	.07
8	Emotional abuse	-.01	<b>.63</b>	-.15
9	Sexual abuse	-.01	<b>.90</b>	.00
<i>I</i>	<i>Affect (<math>\alpha=0.88</math>)</i>			
3	Angry	<b>.68</b>	-.06	.18
4	Afraid	<b>.71</b>	.01	.02
6	Stressed	<b>.88</b>	-.01	-.10
10	Worried	<b>.89</b>	-.02	-.07
11	Anxious	<b>.87</b>	.01	-.05
<i>III</i>	<i>Relationship insecurity (<math>\alpha=0.82</math>)</i>			
1	Secure	.15	-.04	<b>-.61</b>
3	Loved	-.13	-.04	<b>-.56</b>
4	Confident	.22	-.07	<b>-.62</b>
6	Supported	-.11	-.02	<b>-.49</b>
Eigenvalue		12.30	2.39	2.06
% of variance		38.43	7.47	6.44

trauma, negative affect, and relationship insecurity) indicate the theoretical construct the items were originally grouped into. Factor loadings in bold italics indicate the assignment of items to factors. These tables also show the percentage of variance explained by each component for each of the three developmental stages.

The finding of three principal components also fit theoretically with the original aim of the study to create a measure of negative life experiences of trauma, affect, and relationship insecurity. These thirteen items clustered based on the original groupings of: trauma (4 items), affect (5 items), and relationship insecurity (4 items). More specifically, the trauma subscale related to interpersonal trauma and the affect subscale related to negative affect. The relationship insecurity subscale contained words relating to secure relationships, so these items are reversed prior to scoring. The items also appeared to have good face validity, suggesting that three meaningful subscales could be identified. In addition, the results were also consistent with the Eigenvalue Monte Carlo Simulation (which generates eigenvalues for comparison based on random data: Ledesma & Valero-Mora, 2007). The Monte Carlo analysis suggested that three components (for childhood and adolescence) or possibly four (an extra component was borderline for adulthood) should be retained.

Following the exclusion of items through the original PCA, one further three component PCA (with Direct Oblimin rotation) was carried out for the remaining items at each developmental stage. The results were still consistent with a three component structure (eigenvalues  $\geq 1.0$ ), and each of these items still met the original inclusion criteria. The resulting three component solution

with 13 items accounted for at least 66% of the variance at each developmental stage (childhood: 66.8%, adolescence: 66.0%, adulthood: 66.8%).

**Internal consistency.** The three refined subscales (each containing 4 or 5 items) were assessed for internal consistency. Cronbach's Alpha was calculated for each subscale at each developmental stage, and was found to be acceptable to good ( $\alpha$  ranged from 0.68 to 0.88, full results are shown in Table 3a to 3c above). These results suggest that the internal reliability was acceptable for all three subscales at each of the three developmental stages.

**LiNES scoring.** The final version of the LiNES (with scoring instructions) is shown in Appendix L. Scores were calculated for each subscale at each developmental stage (i.e., experiences of interpersonal trauma, negative affect, and relationship insecurity for childhood, adolescence, and adulthood) by calculating an average of the items within that subscale at each stage. Subscale scores were calculated in this way (without replacing any missing data) as long as no more than one item per subscale was missed (i.e., either 3 out of 4 or 4 out of 5 items completed, depending on the subscale). Scores were considered incomplete and not calculated if participants missed more than one item in a subscale. By using average rather than summed scores, comparisons between subscales can be made without needing to consider the number of items.

**Distribution of scores.** Visual inspection of the histogram plots and probability-probability (P-P) plots of LiNES subscale scores indicated that although there were a range of scores, the majority of LiNES subscale scores were not normally distributed. Given the large sample size ( $n=271$ ), it was not appropriate to test the significance of skew and kurtosis, as they were likely to be significant even if skew and kurtosis were only marginally different from normal (Field, 2013). Therefore, parametric tests were used and are reported in

the tables, but non-parametric analyses were also carried out for comparison, and the results of the non-parametric are also reported.

## **Stage 2 – Reliability and Validity of the LiNES**

**Test-retest reliability.** For participants who completed the LiNES on two separate occasions (n=166, testing was approximately two weeks apart), Pearson's correlation coefficients between T1 and T2 were calculated (see Table 4), and they were all significant ( $p < .001$ ), even after Bonferroni-Holm correction for multiple comparisons, and they exceeded the suggested 0.6 cut-off for adequate test-retest reliability (Barker, Pistrang, & Elliot, 1994). These correlations were significant for all subscale scores (experiences of interpersonal trauma, negative affect, relationship insecurity). Spearman's correlation coefficients were also significant ( $p < .001$ ) for all of the same test-retest comparisons.

Although the correlations showed that scores at T1 and T2 were highly correlated, repeated measures t-tests were also calculated for each set of scores to determine whether any of the scores changed significantly T1 to T2. In cases where the t-test was significant, effect size calculations were also carried out to determine the magnitude of the change. These results are all shown in Table 6 and described below. Wilcoxon Signed Rank tests were also carried out for a non-parametric comparison.

For the interpersonal trauma subscale, t-tests did not indicate any significant changes in scores from T1 to T2 for any of the developmental stages. For the negative affect subscale, the repeated measures t-tests indicated significant changes from T1 to T2 for all three developmental stages.

Table 4. Test-Retest Reliability Results

Description	Developmental Stage		
	Childhood	Adolescence	Adulthood
<i>Trauma</i>			
r	<b>.89</b>	<b>.91</b>	<b>.76</b>
t	.11	.65	.04
Cohen's d	-	-	-
<i>Affect</i>			
r	<b>.80</b>	<b>.84</b>	<b>.86</b>
t	3.30*	3.11*	2.30
Cohen's d	.25*	.24*	-
<i>Relationships</i>			
r	<b>.87</b>	<b>.88</b>	<b>.79</b>
t	4.46**	.09	.23
Cohen's d	-.35*	-	-

Notes: Correlations are shown in bold; all correlations were significant at  $p < .001$  and remained significant after Bonferroni-Holm corrections for multiple comparisons; Trauma=LiNES Interpersonal Trauma Subscale; Affect=LiNES Negative Affect Subscale; Relationships=LiNES Relationship Insecurity Subscale;  $r$ =Pearson correlation coefficient; \*indicates t-test significance  $< .01$  (that remained significant after Bonferroni-Holm correction) or effect size  $> 0.2$  (small), \*\* indicates t-test significance  $< .001$  (that remained significant after Bonferroni-Holm correction) or effect size  $> 0.5$  (medium); - indicates where no effect size calculation was carried out due to non-significant t-test.

However, only the results for childhood and adolescence remained significant after the Bonferroni-Holm correction, and the effect sizes for these changes were small (*Cohen's d* = 0.24 to 0.25). For the relationship insecurity subscale, the repeated measures t-tests showed that the scores for childhood changed significantly (with a small to medium effect size: *Cohen's d* = -.35), but there were no significant differences between T1 and T2 for adolescent relationship insecurity or adulthood relationship insecurity. The same pattern of results was found for all comparisons when using Wilcoxon Signed Rank tests. These results show that the scale is relatively robust, although practice effects are possible on some subscales. However, this questionnaire is not designed to be used repeatedly with the same client.

**Concurrent validity.** The LiNES was expected to correlate with existing, well-validated measures of interpersonal trauma, negative affect, and relationship insecurity. As predicted, significant Pearson's correlation

coefficients were identified for each of the LiNES subscales and these other measures (T1 data was used, n=267 to 269). These correlations were significant ( $p < 0.001$ ) for each subscale at each developmental stage (see Table 5) and remained significant when using Bonferroni-Holm to correct for multiple comparisons. They were also significant when using the non-parametric Spearman's correlation coefficient in place of Pearson's ( $p < .01$ ). Overall, 13 of the 27 comparisons had a large effect size, 13 had a medium effect size, and only one had a small effect size.

Table 5. *Convergent validity.*

LiNES Subscale	Validated measure	Correlations (r)		
		Child	Adoles	Adult
Interpersonal Trauma	CATS (n=267)			
	Neglect/Negative Environment	.69	.65	.40
	Punishment	.51	.48	.25
	Sexual Abuse	.42	.53	.37
	Emotional Abuse	.68	.60	.37
	Total Score	.79	.73	.43
Negative Affect	PANAS (n=267)			
	Negative	.46	.59	.72
	Positive	-.24	-.35	-.39
Relationship Insecurity	RSQ (n=269)			
	Anxious	.32	.42	.52
	Avoidant	-.36	-.46	-.53

Notes: All correlations were significant at  $p < .001$ , and remained significant following Bonferroni-Holm correction for multiple comparisons; r=Pearson Correlation Coefficient; CATS = Childhood Abuse and Trauma Scale; PANAS = Positive and Negative Affect Scale; RSQ = Relationship Scales Questionnaire; Adoles = Adolescence.

It was also reassuring that the CATS, which is a measure of childhood experiences was most highly correlated with the LiNES childhood scores (large effect size), relative to the correlations with LiNES adult scores (medium effect size). In addition, the PANAS Negative subscale and RSQ, which ask about experiences later in life, were most highly correlated with LiNES adult scores (large effect size for adulthood versus medium effect size for childhood). This

provides some initial evidence of divergent validity, as well as convergent validity, of the LiNES with other measures. To extend the assessment of divergent validity slightly further, correlations between each LiNES subscale and the measure that were not directly related were also computed (Table 6).

Table 6. *Divergent validity*

LiNES Subscale	Other Measures	Divergent Validity for LiNES Developmental Stages		
		Childhood	Adolescence	Adulthood
Trauma	PANAS Negative	.30	.22	.22
	PANAS Positive	-.19	-.18	-.08
	RSQ Anxious	.26	.28	.28
	RSQ Avoidant	-.26	-.34	-.35
Affect	CATS Total	.61	.51	.38
	RSQ Anxious	.31	.45	.49
	RSQ Avoidant	-.25	-.38	-.43
Attachment/ Relationships	PANAS Negative	.31	.36	.46
	PANAS Positive	-.32	-.42	-.53
	CATS Total	.68	.61	.44

Notes: PANAS=Positive and Negative Affect Scale, Negative=negative affect subscale, Positive=positive affect subscale, RSQ=Relationship Scales Questionnaire, CATS Total=Childhood Abuse and Trauma Scale total score.

The divergent validity results illustrate that when the LiNES subscales were correlated with the less relevant other measures, the effect sizes tended to be smaller, with 10 out of 30 of the correlations falling in the small effect size range and 15 out of 30 in the medium range. However, 5 of the correlations were within the large effect size range.

**Consistency of experiences across the lifespan.** To assess whether it was worth including questions for all three developmental stages (rather than just one), each subscale score was compared to the same subscale score for the other developmental stages (see Table 7). Data from all 271 participants were used for these analyses.

For each subscale, the scores between childhood and adolescence, childhood and adulthood, and adolescence and adulthood the Pearson's correlation coefficients were highly significant ( $p < .001$ ). Spearman's correlation coefficients were also significant ( $p < .001$ ). However, repeated measures t-tests and effect sizes suggested that some subscale scores were significantly different at different developmental stages. Where these were significant, effect size calculations were also carried out.

Table 7. Relationships between childhood, adolescence, and adulthood scores

Description	Developmental Stage		
	Child x Adol (r)	Child x Adult (r)	Adoles x Adult (r)
<i>Trauma</i>			
r	<b>.77</b>	<b>.48</b>	<b>.52</b>
t	1.54	.44	1.54
Cohen's d	-	-	-
<i>Affect</i>			
r	<b>.65</b>	<b>.53</b>	<b>.75</b>
t	13.35**	11.92**	.39
Cohen's d	-.81**	-.73**	-
<i>Relationships</i>			
r	<b>.79</b>	<b>.54</b>	<b>.66</b>
t	10.12**	3.13*	4.59**
Cohen's d	-.63**	-.19	.28*

Notes: Correlations are shown in bold; all correlations were significant at  $p < .001$  and remained significant after Bonferroni-Holm corrections for multiple comparisons; Trauma=LiNES Interpersonal Trauma Subscale; Affect=LiNES Negative Affect Subscale; Relationships=LiNES Relationship Insecurity Subscale; r=Pearson correlation coefficient; \* indicates t-test significance  $< .01$  (that remained significant after Bonferroni-Holm correction) or effect size  $> 0.2$  (small), \*\* indicates t-test significance  $< .001$  (that remained significant after Bonferroni-Holm correction) or effect size  $> 0.5$  (medium); - indicates where no effect size calculation was carried out due to non-significant t-test.

For interpersonal trauma, repeated measures t-tests did not identify any significant differences between the scores for different developmental stages. However, for negative affect and relationship insecurity, repeated measures t-tests did identify significant differences for all but one comparison (no significant difference was found for the negative affect subscale for adolescent versus

adult). Wilcoxon Signed Rank tests led to the same pattern of results (although the difference between total scores for adolescence and adulthood was no longer significant with non-parametric analysis or after Bonferroni-Holm corrections). Effect sizes for the significant differences ranged from small to large. Therefore, participants' reports of their experiences of interpersonal trauma remained relatively stable, but reported experiences of negative affect and relationship insecurity changed significantly across the lifespan.

**Potential clinical validity.** To test whether the LiNES predicted potentially relevant difficulties, multiple regression analyses were carried out. The three LiNES subscale scores were entered as IVs, and this was done for separately for each developmental stage to avoid high multicollinearity. For each set of predictors, the SDQ total score (n=160) was entered as the DV once, then the EPS total score (n=166) and the EPS Impoverished Emotional Experience subscale (n=166) each entered as the DVs in separate regressions. As predicted, the LiNES subscale scores (at each developmental stage) were significant predictors of symptom reporting, emotional processing, and alexithymia (see Table 8). However, looking at the individual predictors of EPS scores suggests that there is a relationship between the type of negative experience and the timing of those experiences (childhood, adolescence, adulthood). Specifically, early experiences of interpersonal trauma appeared to be particularly important for predicting emotional processing difficulties, whilst later life experiences of negative affect and relationship insecurity appeared to

Table 8. LiNES subscales as predictors of somatoform dissociation and emotional dysregulation.

Developmental Stage	DV	Overall			Significant IVs	Individual subscales		
		F	p	% var		t	p	$\beta$
<i>Childhood</i>	SDQ Total	10.25	<.001	14.9	Trauma	4.68	<.001	.43
	EPS Total	12.46	<.001	17.2	Trauma	2.24	.027	.20
	EPS Imp	9.49	<.001	13.4	Trauma Affect	2.66 2.26	.009 .025	.24 .22
<i>Adolescence</i>	SDQ Total	11.81	<.001	16.9	Trauma	4.62	<.001	.40
	EPS Total	20.71	<.001	26.4	Affect	4.79	<.001	.40
	EPS Imp	15.26	<.001	20.9	Affect	4.81	<.001	.42
<i>Adulthood</i>	SDQ Total	6.45	<.001	9.3	Trauma	2.66	.009	.22
	EPS Total	30.42	<.001	34.8	Affect Relationships	5.54 3.75	<.001 <.001	.42 .29
	EPS Imp	15.27	<.001	20.6	Affect Relationships	4.12 2.25	<.001 .026	.35 .20

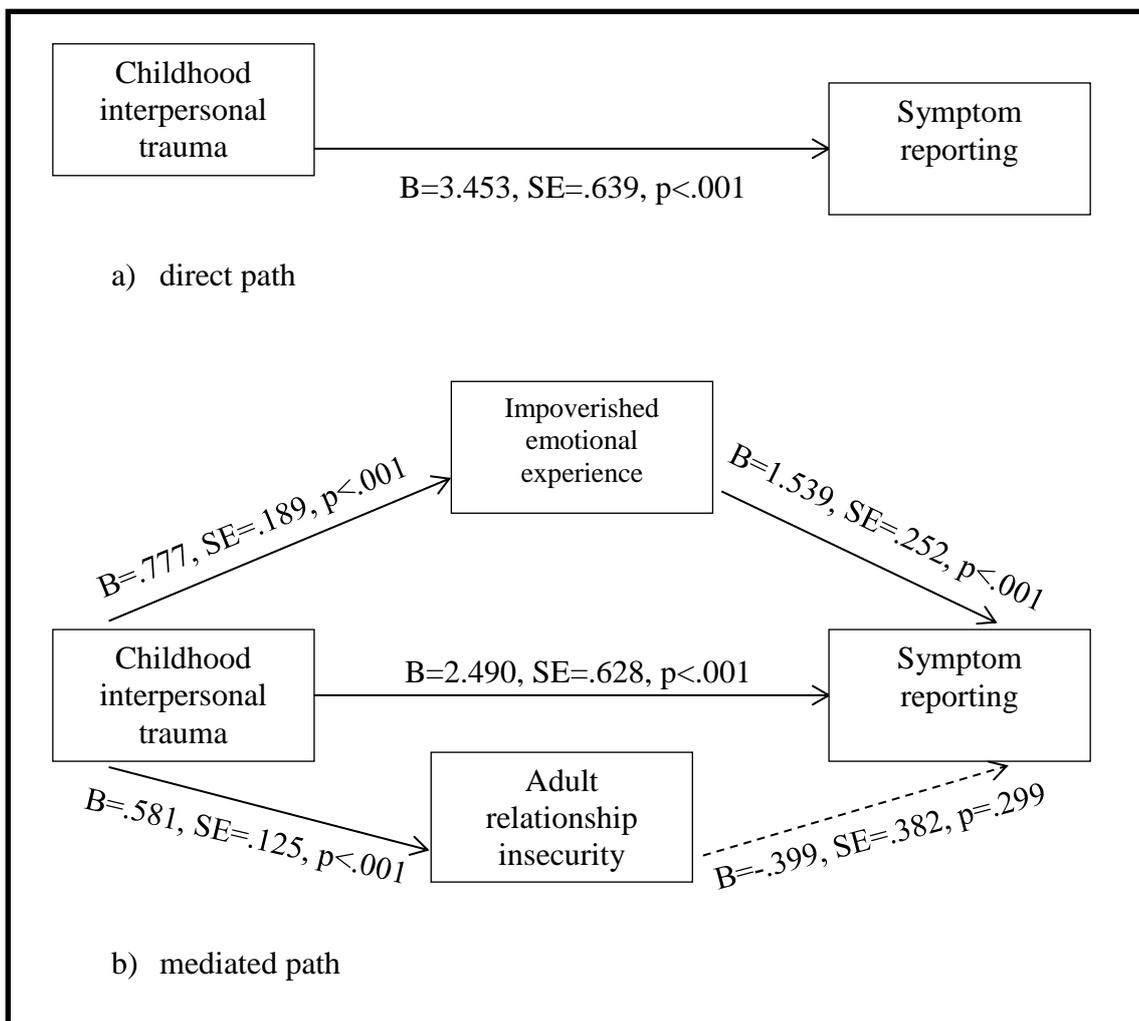
Notes: DV=dependent variable, IV=independent variable, IVs were considered significant if they were below the Bonferroni-Holm correction threshold, F=F statistic, p=p-value, % var=percent variation, t=t statistic,  $\beta$ =Beta, SDQ=Somatoform Dissociation Questionnaire (20 item version), EPS=Emotional Processing Scale (25 item version); EPS Imp=Impoverished Emotional Experience Subscale of the EPS; Overall=Overall LiNES score (average of all developmental stages); NA=not applicable.

be particularly important. For symptom reporting, trauma was consistently an independent predictor across all three developmental stages. However, experiences of negative affect in adulthood were also significant.

### **Stage 3 – Potential Pathways from Trauma to Symptom Reporting**

Stage 3 of the data analysis focused on testing whether the relationship between early interpersonal trauma and symptom reporting were mediated by alexithymia and adult experiences of relationship insecurity. In order to test this, the LiNES childhood interpersonal trauma score was entered in Step 1 of a hierarchical multiple regression analysis, with the LiNES adult relationship insecurity subscale score in Step 2, the EPS impoverished emotional experience subscale in Step 3, and the SDQ score as the DV. In this analysis, the LiNES Childhood Trauma subscale score explained approximately 16% of the variance in SDQ scores ( $R^2 = .157$ ,  $F(1,158) = 29.41$ ,  $p < .001$ ). The addition of the LiNES adult relationship insecurity subscale score at step 2 did not produce a significant increment in the amount of variance explained in symptom reporting ( $\Delta R^2 = .002$ ,  $F(1,157) = .412$ ,  $p = .522$ ). However, the addition of the EPS impoverished emotional experience subscale score at step 3 did produce a significant increment in the amount of variance explained in symptom reporting ( $\Delta R^2 = .162$ ,  $F(1,156) = 37.25$ ,  $p < .001$ ), with impoverished emotional experience and childhood interpersonal trauma both emerging as significant independent predictors. The variables in the final regression equation explained approximately 32% of the variance in symptom reporting,  $R^2 = .321$ ,  $F(5,156) = 24.61$ ,  $p < .001$ .

Mediation analysis was then conducted with LiNES childhood interpersonal trauma subscale score as the IV, LiNES adult relationship insecurity subscale and EPS Impoverished Emotional Experience scores as mediators, and SDQ total score as the DV. The path from trauma (IV) to impoverished emotions (mediator 1) was significant,  $B = .777$ ,  $SE = .189$ ,  $p < .001$ , and the path from trauma to adult relationship insecurity (mediator 2) was



**Figure 2.** Mediation analysis: Child interpersonal trauma (LiNES child trauma subscale), LiNES relationship insecurity, impoverished emotional experience (EPS-25 subscale), and symptom reporting (SDQ); (a) direct path (b) mediated path

significant,  $B = .581$ ,  $SE = .125$ ,  $p < .001$ . The direct effect of impoverished emotions (mediator 1) on symptom reporting (DV) was significant,  $B = 1.54$ ,  $SE = .252$ ,  $p < .001$ , but the direct effect of adult relationship insecurity (mediator 2) on symptom reporting was not significant,  $B = -.399$ ,  $SE = .382$ ,  $p = .299$ . In addition, the direct effect of childhood interpersonal trauma on symptom reporting remained significant even after adult relationship experiences and impoverished emotional experience were included, (c' path:  $B = 2.490$ ,  $SE = .628$ ,  $p < .001$ ). Using bootstrapping procedures, the total mediated effect was found to be significant,  $B = .947$ ,  $SE = .501$ ,  $CI = .189$  to  $2.206$ . Inspection of the individual mediator variables revealed that impoverished emotional experience mediated the effect of relationship insecurity on symptom reporting,  $B = 1.192$ ,  $SE = .521$ ,  $CI = .415$  to  $2.553$ , whereas relationship experiences did not,  $B = -.232$ ,  $SE = .255$ ,  $CI = -.838$  to  $.199$ .

## Discussion

This study provided an initial validation of a new lifespan measure of interpersonal trauma, negative affect, and relationship insecurity. This questionnaire was found to significantly predict difficulties that are potentially relevant to people with functional symptoms, and the developmental timing of experiences seemed to be important. In addition, a potential pathway between childhood interpersonal trauma and symptom reporting was explored, and a potential pathway between childhood interpersonal trauma and symptom reporting, mediated by alexithymia, was identified. The theoretical and clinical implications of this study will be discussed below, followed by a discussion of the study's limitations and suggestions for future directions.

## **Clinical Implications**

**Development of the LiNES.** Although the current study only included a non-clinical sample for the initial stage of validation, the results of this study suggest that the LiNES is a valid and reliable measure of experiences of interpersonal trauma, negative affect, and relationship insecurity across the lifespan. The LiNES correlates very highly with relevant measures of the three constructs, but it is much shorter compared to other existing measures, with just 13 items (optionally completed once for each developmental stage). It also predicts variables of potential clinical relevance (emotional processing and symptom reporting), and a longer term aim of the study will be to validate this questionnaire in clinical populations. In particular, it is likely to be a helpful assessment tool in medical settings where functional symptoms are common. Although this tool does not screen for functional symptoms, it could be useful for screening for some potentially relevant predisposing, precipitating, or perpetuating factors. This information could then be used to identify the treatment pathway that is most likely to be relevant for each individual. The LiNES could also be used as an assessment tool in health and medical psychology settings, or in psychology settings more generally, to gather some background information about clients that could be relevant to their presenting difficulties. However, it will be important to continue to focus on developing a shared formulation with clients rather than relying on a very brief screening tool that could fail to identify important information.

**Importance of Alexithymia.** The mediation analysis carried out in this study suggests that alexithymia could mediate the relationship between early life adversity and current physical symptoms. Alexithymia could also play a role in the development and maintenance of other mental health difficulties. As

psychologists, it is often easy to assume that people have a basic understanding of emotions, that they can identify what they are feeling, and that they can describe them appropriately. However, alexithymia was quite common in the participants included in this study, which suggests that assessing people's emotional awareness, and helping clients to develop their emotional awareness could be a very important part of any clinical psychology interventions.

### **Theoretical Implications**

**Timing of negative experiences.** In addition to creating a questionnaire that encompassed three clinically relevant constructs in a shorter and more acceptable format, another motivation for creating the LiNES was to measure experiences across the entire lifespan. The results of this study suggested that people's experiences of interpersonal trauma, negative affect, and relationship insecurity were highly correlated throughout their lives, and there were no significant differences in reported experiences of interpersonal trauma between any of the three developmental stages. However, in spite of high correlations, there were differences between childhood, adolescence, and adulthood scores for experiences of negative affect and relationship insecurity, suggesting that people's experiences of negative affect and relationship insecurity are less consistent across the lifespan.

In terms of clinical validity, average LiNES scores for childhood, adolescence, and adulthood were all highly significant predictors of emotional processing difficulties and symptom reporting. However, the individual predictors were not consistent across all developmental stages. This suggests that both the timing and types of experiences are important, and that these two

factors (timing and type of experience) might interact to influence later difficulties. However, it is worth mentioning that experiences of trauma in childhood were significant predictors of both symptom reporting and emotional processing difficulties, perhaps suggesting that childhood trauma might be a particularly strong predictor of clinical symptoms. This finding is consistent with a large body of work showing the impact of early life experiences on future mental well-being (e.g., Brown et al., 2005; Evren, Evren, Dalbudak, Ozcelik, & Oncu, 2009; Holman, Kirkby, Duncan, & Brown, 2008a).

Taken together, the results of the current study suggest that using the LiNES for just one developmental stage would be valid, reliable, and provide meaningful information. Therefore, in situations when it is not feasible to include all three developmental stages, just one could be used. In those cases, the particular developmental stage chosen should be driven by the theoretical or clinical question. However, wherever possible, it is useful to include all three developmental stages, as there were differences between scores at different stages, and including all three stages provides more detailed information about an individual's history (e.g., specific types of trauma). Having a measure of negative life experiences at different life stages is also likely to be useful in future research applications.

**Negative life experiences, alexithymia, and symptom reporting.** The results of this study build on existing theories suggesting that there is a relationship between negative life experiences and symptom reporting (e.g., Brown et al., 2004). In particular, the results suggest that alexithymia could partially mediate the relationship between early life interpersonal trauma and current symptom reporting.

Interestingly, whilst the majority of previous papers have focused on groups with functional symptoms (e.g., Brown & Reuber, 2016; Brown, 2006; Wearden et al., 2005), this study found the same pattern of results in a community sample, where diagnosis of the symptoms was not taken into account. This suggests that the same predisposing / precipitating factors are likely relevant to a wide range of symptoms, including milder functional symptoms that might never be reported to a doctor and also some symptoms that might have a pathophysiological explanation.

### **Limitations**

Although the LiNES includes three different types of life experiences (trauma, negative affect, and relationship insecurity), and it predicts difficulties that could be relevant for clinical groups, it will need to be validated with participants from clinical populations. In addition, the items and subscales within the LiNES are not comprehensive. For example, the items that remained in the trauma subscale after refinement all seem to relate to interpersonal trauma (i.e., abuse and neglect), and interestingly, interpersonal trauma might be more relevant than other types of trauma for functional symptoms (e.g., Holman et al., 2008; Landa, Bossis, et al., 2012). However, experiences such as illness and poverty were discarded during the analysis due to lower factor ratings, and non-interpersonal forms of trauma (e.g., illness, bereavement, starvation) might be more relevant for people from different backgrounds. In addition, the three constructs of trauma, relationship insecurity, and affect are all related, and therefore, it was not surprising that the LiNES subscales were correlated with the other less related validation measures included in the study.

Although analysis of the demographic data for the participants in this study suggest that the sample included people from a range of ages and subjective socio-economic backgrounds, our sample included a majority of women and had a skew toward people from younger age groups. In addition, very few people reported coming from the lowest subjective SES backgrounds, and the measure of SES in this study was purely subjective. Many of the sampling biases in this study are likely to result from the fact that the original recruitment e-mail was sent out to a university mailing list, and perhaps also because the data were gathered using online questionnaires, which might have been more accessible for younger people, and perhaps those with more education. Given that the sample included in this study is only representative of a particular and limited population, further validation of the LiNES will be needed, and it is important to keep in mind that the results of this study will not be generalizable to everyone.

Item generation in this study was also limited to the three study authors, based on their understanding of relevant research. It would have been useful to include service users at the item generation stage, or to ask service user volunteers if they could suggest any additional items that would be relevant. Checking with a relevant clinical group to ensure a broad enough range of samples would have improved the study's content validity (Kline, 2000). In addition, it is worth noting that the decision to select a set of items that were consistently correlated with the same factors in the factor analysis meant that the same items could be used at different developmental stages. However, it is possible that scores at different developmental stages would have been less highly correlated if more of the original items had been retained. However, the results indicate that there were still some differences in scores across different

developmental stages, and losing some of the variability is a trade-off for having a consistent set of items across all three developmental stages.

It is also worth mentioning that this questionnaire was validated using traditional methods, and there are newer methodologies, including Rasch analysis (Rasch, 1980), that are increasingly being used in questionnaire validation. Rasch analysis assumes that the probability of endorsing a particular question can be calculated based on the difference between someone's level of the trait being measured (e.g., ability) and the item's level of difficulty. By using a Rasch model, it is possible to create a true interval scale of measurement, where total scores are related in a linear way to the characteristics they measure. In addition, it ensures that item functioning is not based on the specific sample of participants used in validation, but that the measure is valid for use across different groups. Although Rasch analysis would add to the overall quality of the LiNES, the LiNES is not intended to become a diagnostic tool, there will not be different versions of the test, and it is simply a means of efficiently and sensitively gathering background information about clients' experiences. As such, traditional validation methods were considered sufficient.

### **Future directions**

Having a simple measure to quantify negative life experiences could be useful for many future research applications – for instance those exploring the effects of negative life experiences on brain or emotional development. By using the LiNES, it would be possible to consider whether the timing of negative experiences was relevant.

Future work to understand more about the constructs being measured by the LiNES would be useful. In particular, as mentioned above, the LiNES

trauma subscale only includes examples of interpersonal trauma. Therefore, there might be other types of traumatic experiences that would form a separate subscale. In addition, the relationship insecurity subscale only includes feelings in relationships, and this might also be closely related to self-esteem (which fits with the idea that we form a model of ourselves based on interactions with others). It would also be interesting to understand more about how experiences of interpersonal trauma, negative affect, and relationship insecurity are related. The results of the current study suggest that interpersonal trauma in childhood is a consistent, significant predictor of both emotional processing difficulties and symptom reporting. However, it is possible that early experiences of trauma also impact emotional and social development, and thus also influence experiences of affect and relationships later in life.

On a related note, given the strong predictive ability of negative experiences early in life, and the strong correlations between life experiences at all three developmental stages, the current study suggests that early intervention and prevention might be important for people at risk of experiencing negative life experiences. Interventions providing additional support for parents or foster carers might be the most useful for preventing negative experiences in childhood, but early interventions with children could also help to ameliorate the effects. Future research would need to determine whether this was effective. As part of this future research into prevention, it would also be very helpful to understand more about factors that are protective for people, even when they have had negative life experiences that might otherwise make them vulnerable.

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## APPENDIX A. UNIVERSITY ETHICS APPROVAL

### Confirmation of Final Ethics Approval (following amendments)

**Date:** 30 April 2015 09:54:17 BST  
**Subject: Re: Ethics amendment application**  
**From:** P Norman <[p.norman@sheffield.ac.uk](mailto:p.norman@sheffield.ac.uk)>  
**To:** Liat Levita <[l.levita@sheffield.ac.uk](mailto:l.levita@sheffield.ac.uk)>

Dear Liat,

Thank you for your email re: your proposed study "Initial Validation of a New Measure of Trauma, Attachment, and Affect".

Given the nature of the minor nature of the changes, I am able to **approve** the amendments to your previous **approved** submission to the Department of Psychology Ethics Sub-Committee (DESC) entitled "Validation of a new affect and trauma questionnaire" on Chair's action.  
Yours sincerely,

Prof Paul Norman

Acting Chair, DESC

**From:** Liat Levita <[l.levita@sheffield.ac.uk](mailto:l.levita@sheffield.ac.uk)>  
**Subject: Ethics amendment application**  
**Date:** 1 April 2015 08:44:43 BST  
**To:** paul norman <[p.norman@sheffield.ac.uk](mailto:p.norman@sheffield.ac.uk)>  
**Cc:** "[emayberry1@sheffield.ac.uk](mailto:emayberry1@sheffield.ac.uk) Mayberry" <[emayberry1@sheffield.ac.uk](mailto:emayberry1@sheffield.ac.uk)>

Dear Paul,

Hope all is well.

I am enclosing an amended **ethics** application which has already got **approval** (see message below)

I was not sure if it needed to be resubmitted again online? Do let me know. All the change to the protocol are highlighted in blue.

Thank you for your help in advance.

With best wishes,

Liat

### Confirmation of Original Ethics Approval (prior to amendments)

**From:** Psychology Research Ethics Application Management System  
no\_reply@Psychology Research Ethics Application Management System  
**Subject:** Approval of your research proposal  
**Date:** 24 July 2014 10:33  
**To:** L.Levita@sheffield.ac.uk

PR

Your submission to the Department of Psychology Ethics Sub-Committee (DESC) entitled "Validation of a new affect and trauma questionnaire" has now been reviewed. The committee believed that your methods and procedures conformed to University and BPS Guidelines.

I am therefore pleased to inform you that the ethics of your research are approved. You may now commence the empirical work.

Yours sincerely,

Prof Richard Crisp

Chair, DESC

## APPENDIX B. ORIGINAL ITEMS FOR LINES

**PART A:** In your \*<sup>1</sup>\_\_\_\_\_ to what degree did you experience?

	Never	Very rarely	Rarely	Sometimes	Often	Very often	All the time
	0	1	2	3	4	5	6
Illness							
Stress							
Poverty							
Trauma							
Physical neglect							
Physical abuse							
Emotional neglect							
Emotional abuse							
Sexual abuse							

**PART B:** During your \*<sup>1</sup>\_\_\_\_\_ to what extent did you feel

	Never	Very rarely	Rarely	Sometimes	Often	Very often	All the time
	0	1	2	3	4	5	6
Sad							
Happy							
Angry							
Afraid							
Relaxed							
Anxious							
Stressed							
Worried							
Guilty							

**PART C:** During your \*<sup>1</sup>\_\_\_\_\_ to what extent did you feel

	Never	Very rarely	Rarely	Sometimes	Often	Very often	All the time
	0	1	2	3	4	5	6
Secure							
Lonely							
Loved							
Confident							
Ignored							
Supported							
Unlovable							
Disliked							
Unlovable							

<sup>1</sup> This will be filled in for the different developmental categories specified in page 1.

## APPENDIX C. PARTICIPANT INFORMATION SHEET



University of Sheffield  
Department Of Psychology.  
**Clinical Psychology Unit.**

Doctor of Clinical Psychology (DClin Psy)  
Programme  
Clinical supervision training and NHS research  
training & consultancy.

### **Feelings and Experiences Throughout Development Study**

#### **You are being invited to take part in a research study.**

This project is being conducted as part of a clinical psychology training programme, which will lead to the award of a doctoral degree. Before you decide whether or not you wish to take part it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully, and to think about whether or not you would like to take part.

#### **What is the purpose of the study?**

The purpose of this study is to develop a new questionnaire which asks about particular types of experiences and emotions people might have throughout their lives. Specifically, this questionnaire focuses on experiences and emotions that might be relevant people who have a diagnosis of psychogenic non-epileptic seizures. This is a common and debilitating problem that is not yet well understood, and our goal is for this questionnaire to become a useful tool to guide more individualized psychological therapy for people with a diagnosis of non-epileptic seizures. In addition, the follow-up questionnaires will be used to try to understand more about why some people experience psychogenic non-epileptic seizures.

#### **Who is being asked to take part?**

We are asking individuals who are native English speakers and aged at least 18 years old to take part in this study. Unfortunately, we cannot include anyone who has a diagnosis of epilepsy or non-epileptic seizures.

#### **What will be involved if I agree to take part in the study?**

If you are interested in taking part, you will initially need to sign a consent form. You will then be asked to complete a set of questionnaires online. The questions will ask some details about you (e.g., age, socioeconomic background), then about feelings and experiences you might have had during your life. It is estimated that completion of the set of questionnaires will take roughly 45 minutes in total. Some of the questions ask about the past, and we are aware that it might be difficult to remember, but we would be grateful if you would answer each question to the best of your recollection.

Some of the questions deal with sensitive topics, which might be upsetting for some people. It is important for our research to have completed surveys. Therefore, if you skip any questions, you will be prompted to answer them. However, you will have the option to quit at any time, without giving a reason. There will be an opt-out button on every screen.

If you agree to be contacted for the follow-up study, you will receive an e-mail invitation approximately two weeks later.

### **Prize Draw**

As a thank you for your participation, you will be entered into a prize draw to earn a £20 high street gift card. In addition, if you complete the first questionnaire and you are willing to be contacted again in two weeks, you will receive an e-mail asking you to complete a very short follow-up questionnaire (which will take approximately 25 minutes). If you complete the second questionnaire, you will be entered into an additional prize draw to win another £20 high street gift card.

### **Do I have to take part?**

No. There is no obligation to take part. If you do not wish to take part please feel free to close the survey at any time. There is no need for you to give a reason as to why you decided not to take part. Your decision to take part or not will be kept confidential.

### **Benefits and disadvantages to taking part in this study**

There will be no direct benefits to you as a result of taking part in this study. However, it is hoped that the information obtained will help to inform improvements to the support given to patients who have a diagnosis of non-epileptic seizures.

It is not felt that there are likely to be any to be any disadvantages to consenting to take part, other than the time needed to complete the set of questionnaires. However, it is possible that you might find some of the questions upsetting. Whenever you quit or finish the survey, details of organisations you can contact for further support will be provided in case you are feeling upset or worried. If you are feeling very upset, and feel that you are in any danger, please contact your GP or go to the A&E department immediately.

### **Can I withdraw from the study at any time?**

Yes. You may withdraw at any time without giving a reason and without any consequences.

### **Will the information obtained in the study be confidential?**

All the information that we collect about you during the course of the research will be kept strictly confidential. If you agree to take part in the follow-up study or you wish to be entered in the prize draw, you will need to provide your e-mail address. Your e-mail address will initially be used to match up your responses for the two time points and to notify you if you win the prize draw. However, all identifying details will be stored separately from your responses, and it will not be possible to identify you in any reports or publications.

### **What will happen to the results of the study?**

The project is being conducted as part of my training for the Doctorate Programme in Clinical Psychology. A report of the results will be written for the University of Sheffield. The findings of the research will be presented to some of the staff at the

Epilepsy Service and to other healthcare professionals. The results will also be submitted for publication. All of the above reports will present the findings anonymously, and it will not be possible for anyone to know the identities of any of the people who participated in the research.

**What if I have any concerns about the way in which this study has been conducted?**

If you have any questions or concerns about any aspect of the study, please contact Emily Mayberry: A message can be left for me by telephoning Ian Macdonald, Research Support Officer, on (0114) 222 6650. Ian can only relay messages, and cannot answer queries himself. I will return your call as soon as possible. Alternatively, you can contact my research supervisor, Dr Liat Levita, on (0114) 222 6651, or email her at [l.levita@sheffield.ac.uk](mailto:l.levita@sheffield.ac.uk) or you can contact Markus Reuber, who is the clinical supervisor of this project, by email: [markus.reuber@sth.nhs.uk](mailto:markus.reuber@sth.nhs.uk) or telephone 0114 226 8688.

If you wish to complain about any aspect of the way in which the study has been run, please also contact me, either by phone (via Ian Macdonald, or email me at [emayberry1@sheffield.ac.uk](mailto:emayberry1@sheffield.ac.uk)).

Formal complaints on behalf of the University of Sheffield are handled by: Dr David Fletcher, University Registrar & Secretary, Registrar & Secretaries Office, Firth Court, Weston Bank, S10 2TN. Tel: (0114) 222 1100. Formal complaints can also be made using the NHS complaints procedure. You can contact the Complaints & Litigation Lead, Sheffield Health and Social Care NHS Foundation Trust, Fulwood House, Old Fulwood Road, Sheffield, S10 3TH. Tel: (0114) 2718956.

**Who is overseeing the research?**

This project is funded by the University of Sheffield, and has been ethically approved by the University of Sheffield. You can access this information sheet at any time by clicking on the link to this survey in your e-mail. If you would like a copy of this information sheet e-mailed to you, please feel free to contact me via e-mail and I would be happy to send it.

**Who can I contact if I have any questions about this study?**

If you have any questions about any aspect of this study, please email Emily Mayberry on [emayberry1@sheffield.ac.uk](mailto:emayberry1@sheffield.ac.uk). Alternatively, a message can be left for Emily Mayberry by telephoning Ian Macdonald, Research Support Officer, on (0114) 222 6650. Ian can only relay messages, and cannot answer queries himself. Emily will return your call as soon as possible. You can also contact my research supervisor, Dr Liat Levita, on (0114) 222 6651, or email her at [l.levita@sheffield.ac.uk](mailto:l.levita@sheffield.ac.uk). Or Markus Reuber, who is the clinical supervisor of this project, by email: [markus.reuber@sth.nhs.uk](mailto:markus.reuber@sth.nhs.uk) or telephone 0114 226 8688.

**Thank you for taking the time to read this information sheet.**

## APPENDIX D. PARTICIPANT CONSENT FORM



University of Sheffield.  
Department Of Psychology.  
**Clinical Psychology Unit.**

Doctor of Clinical Psychology (DClinPsy)  
Programme  
Clinical supervision training and NHS research  
training & consultancy.

Title of Project: **Feelings and Experiences throughout Development Study**

Name of Researcher: Emily Mayberry *Please tick each box*

- 1) I confirm that I have read and understand the participant information for this study, and know who to contact if I would like to ask questions.
- 2) I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.
- 3) I understand that I will not be identified or identifiable in the report or reports that result from the research.
- 4) I agree for the anonymised data being collected for this study to be available for use in future studies.
- 5) I agree to take part in this study.

APPENDIX E. DEBRIEFING SHEET

*Thank you very much for your time and participation.*

**We hope that you have not found completing this survey upsetting. However, we understand that some of the questions might be upsetting for some people.**

**In case you are feeling distressed and would like support, we have listed the contact details for several relevant organisations below. If you need more urgent support, please contact your GP or the emergency services.**

Sheffield University counselling service (for Sheffield students)  
36 Wilkinson Street, Sheffield, S10 2GB  
Telephone: 0114 222 4134  
Email: UCS@sheffield.ac.uk  
[www.shef.ac.uk/ssid/counselling](http://www.shef.ac.uk/ssid/counselling)

Mind  
Helpline: 0300 123 3393 (9am-6pm, Monday to Friday)  
[www.mind.org.uk](http://www.mind.org.uk)

Samaritans  
Helpline: 08457 90 90 90  
[www.samaritans.org](http://www.samaritans.org)

## APPENDIX F. PERMISSION TO USE EPS-25

### Agreement of Use relating to the use/distribution of the EPS scale and connected documents

This agreement permits the use of the Emotional Processing Scale (EPS) for the purpose of research, using 'Qualtrics' survey software.

The Agreement allows this use free of charge and shall come into force upon receipt of the signed copy of the Agreement and continue in force until the end of the length stated in the research proposal.

Upon signing the agreement, the researchers agree that the Emotional Processing Scale, as well as connected instruction documents, are strictly confidential. To protect the copyright the information and documents will be handled so that the test (in the form of the items) is not 'leaked', published or maligned in some way.

The researcher agrees not to change any items, their order or the scoring method or allow any person outside the group of involved professionals to use the EPS for any purpose other than the Permitted Purpose or with any other system.

This of course does not include sharing of information with colleagues who have a need to access the EPS Information for the performance of their work with respect to the proposed study and who are bound by professional obligation to protect the Information. Nor does this restrict the presentation of results at meetings, conferences, journal article or thesis, though in the reporting of the study care should be taken not to make the whole EPS available for others to copy.

Given imminent publication of the EPS research in March 2015 the use will be limited to the length of time stated in the proposal and the researchers agree to cease the use of the EPS once their research has reached completion.

We are always seeking to update the norms so at some future date the publishers might ask the researcher for permission to share their data and use it in an updated Manual of norms.

By signing below the parties have indicated their acceptance of this Agreement.

**PRINTED:** *Emily Mayberry...*

**SIGNED:** *Emily Mayberry*.....

**DEPARTMENT:** *Clinical Psychology Unit*.....  
*University of Sheffield*

## APPENDIX G. RECRUITMENT E-MAIL

### **SUBJECT: Online Psychology Questionnaires - opportunity to win £20!**

Dear All,

We are currently running a study looking at emotions and experiences throughout the lifespan. More specifically, we are interested in learning more about the relationship between the events and emotions that some people might experience throughout our lives. Our aim is to develop a new questionnaire that will help psychologists to better understand and meet the needs of certain client groups at the beginning of therapy.

We are looking for individuals aged 18 and over, who are native English speakers, to take part. You will be asked to fill in some online questionnaires about emotions and about experiences you may have had at different points in your life. The questionnaires should take about 20-25 minutes to complete. Some people might find some of the questions distressing, but you will have the option to quit the study at any time without giving an explanation, and your answers will all be anonymous. If you take part there is an opportunity to win a £20 Amazon voucher.

If you would like to take part and/or want more information, please click on this link:

[https://sheffieldpsychology.eu.qualtrics.com/SE/?SID=SV\\_0lezO6iJ04vsfoV](https://sheffieldpsychology.eu.qualtrics.com/SE/?SID=SV_0lezO6iJ04vsfoV)

This work is being conducted by Emily Mayberry ([emayberry1@sheffield.ac.uk](mailto:emayberry1@sheffield.ac.uk)) and supervised by Dr Liat Levita [[l.levita@shef.ac.uk](mailto:l.levita@shef.ac.uk)]. This study has been approved by the Department of Psychology, University of Sheffield ethics committee, and is in accordance with the British Psychological Society guidelines.

Please feel free to contact me if you would like any more information about the study or if you have any questions.

Best wishes,

Emily ([emayberry1@sheffield.ac.uk](mailto:emayberry1@sheffield.ac.uk))

## APPENDIX H. DEMOGRAPHICS PROFORMA



### Personal Details

**Gender**

Male

Female

**Date of Birth (DD/MM/YYYY)**

**What is your ethnic group?** Choose one option that best describes your ethnic group or background.

- White
- Mixed / Multiple ethnic groups
- Asian / Asian British
- Black / African / Caribbean / Black British
- Other

**Where did you grow up? (If you lived in multiple places, please select the one where you spent the most time).**

- United Kingdom
- United States
- Canada
- Australia
- New Zealand
- South Africa
- Other (please list below)

**At any point in your life, have you been diagnosed with:**

- Anxiety
- Depression
- Post-traumatic stress disorder (PTSD)
- Autism spectrum disorder
- Epilepsy
- Chronic Pain, Chronic Fatigue Syndrome/ME, or Irritable Bowel Syndrome
- Any mental health condition not listed above (please specify below)
- Any developmental disorder not listed above (please specify below)
- Any seizures not listed above (e.g., non-epileptic seizures, please specify below)
- Any medically unexplained symptoms
- None of the above

**Who were primary caregivers when you were growing up?**

*Please select all that apply.*

- Father
- Mother
- Step-father
- Step-mother
- Grandmother
- Grandfather
- Other family member (please specify, e.g., aunt, uncle, cousin, brother, sister)
- Other (please specify, e.g., neighbour, foster parent, care home)

- Quit survey** (By selecting this option, then clicking on the arrows to continue to the next page, you will be taken to debriefing information. You will not be able to resume the survey later).

0%  100%

## **APPENDIX I. SES LADDER**

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## APPENDIX J. VALIDATION MEASURES

### **Childhood Abuse and Trauma Scale**

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**Positive and Negative Affect Schedule**

(content of page 116 removed for online version due to copyright)

**Relationship Scales Questionnaire**

(content of page 117 removed for online version due to copyright)

## APPENDIX K. RELEVANT SYMPTOM MEASURES

### **Somatoform Dissociation Questionnaire (Nijenhuis et al., 1996)**

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**APPENDIX L. LIFETIME NEGATIVE EXPERIENCES SCALE (LiNES)**

**Instructions**

**In each of the following sections, you will be asked to rate how often you had some particular experiences and had certain feelings. You will be asked to rate the same items several times, in order to find out about your experiences during three different stages of your life (childhood, adolescence, and adulthood).**

**PART A:** In your \* \_\_\_\_\_ to what degree did you experience...?

	Not at all			Some			A lot	
	0	1	2	3	4	5	6	Scoring (response)
Physical neglect								
Physical abuse								
Emotional abuse								
Sexual abuse								
Average (if at least 3 items completed)								A

**PART B:** During your \* \_\_\_\_\_ to what extent did you feel...?

	Not at all			Some			A lot	
	0	1	2	3	4	5	6	Scoring (response)
Angry								
Afraid								
Stressed								
Worried								
Anxious								
Average (if at least 4 items completed)								B

**PART C:** During your \* \_\_\_\_\_ to what extent did you feel...?

	Not at all			Some			A lot	
	0	1	2	3	4	5	6	Scoring <sup>X</sup> (6-response)
Secure <sup>X</sup>								
Loved <sup>X</sup>								
Confident <sup>X</sup>								
Supported <sup>X</sup>								
Average (if at least 3 items completed)								C

\*This will be filled in for three different developmental categories – childhood, adolescence, and adulthood.

<sup>x</sup>Note: all four items in Part C are reverse scored. Therefore, the score for each item is calculated by subtracting the score from 6 (e.g., if someone scores an item as 6, this would be reversed as 6-6=0; if someone scores an item as 1, this would be reversed by 6-1=5; therefore, 6=>0, 5=>1, 4=>2, 3=>3, 2=>4, 1=>5, 0=>6).

Missing data: If more than one item per subscale is missing, subscale scores should not be calculated.

## LiNES Scoring grid

	<b>Interpersonal Trauma</b>	<b>Negative Affect</b>	<b>Relationship Insecurity</b>
<b>Childhood</b>	A1	B1	C1
<b>Adolescence</b>	A2	B2	C2
<b>Adulthood</b>	A3	B3	C3