






Identifying subgroups of individuals based on their epistemic stance, attachment dimensions and childhood trauma: A latent profile analysis

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ABSTRACT

Background: The present study examines the interplay between epistemic stance, attachment dimensions, and childhood trauma in relation to specific demographic factors and mental health outcomes. This study aims to understand how these factors form distinct profiles among individuals, to identify those at risk of mental health concerns.

Method: Latent Profile Analysis (LPA) was employed on a dataset from the general population ($n = 500$) to identify subgroups of individuals based on their epistemic stance (mistrust and credulity), attachment dimensions, and childhood trauma. Group comparison tests examined differences in sociodemographic variables across the profiles, whilst linear regression analyses investigated between-profile variations in mental health and wellbeing measures.

Results: The LPA revealed a four-profile solution as the most suitable fit for the data. The latent profiles were characterised as follows: LP1 (14% of the sample; high levels of mistrust and low scores on all other measures), LP2 (62% of the sample; average scores on all measures), LP3 (15% of the sample; highest scores on all measures), and LP4 (9% of the sample; lowest scores on all measures). Between-profile significant differences were found for relationship status and education levels. Linear regression analyses demonstrated variations across the profiles for mental health symptoms and wellbeing measures.

Conclusions: This study identified four distinct profiles with specific combinations of epistemic stance, attachment dimensions, and childhood trauma. These profiles were associated with differing levels of mental health symptom severity and wellbeing, suggesting their potential utility in informing preventive strategies targeting individuals at highest risk of negative outcomes.

1. Introduction

Epistemic Trust (ET) refers to an individual's trust in communication and knowledge conveyed by others, reflecting their receptiveness to external knowledge (Sperber et al., 2010). Recently, the concept of ET has been applied to understand the social-cognitive processes underlying psychopathology (Fonagy et al., 2015, 2022), with the suggestion being that dysfunctions in the capacity to trust others as sources of social information hinders processes that support healthy functioning and

undermines resilience (Fonagy et al., 2017, 2022). Empirical research testing this model has started to emerge, with attempts to measure individual differences in the capacity to form epistemically trusting relationships. A recently developed and validated scale, The Epistemic Trust, Mistrust and Credulity Questionnaire (ETMCQ; Campbell et al., 2021), measures an individual's epistemic stance through three subscales: epistemic trust (willingness to be influenced by reliable sources), mistrust (heightened vigilance towards information communicators), and credulity (a tendency to uncritically accept knowledge from

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unverified sources). We focus here on the two dimensions thought to be associated with greater risk of psychopathology: epistemic mistrust and epistemic credulity.

These three factors, although correlated, have distinct characteristics and have shown associations with childhood trauma and mental health symptoms in adults. Specifically, both epistemic mistrust and credulity have been linked to insecure attachment and childhood trauma. Furthermore, these factors partially mediate the relationship between trauma and mental health symptoms (Campbell et al., 2021). Attachment dimensions, that encompass the variable patterns of emotional and relational responses (secure, anxious, avoidant and disorganised), have also been shown to be related to epistemic stance (Campbell et al., 2021). More specifically, it is important to note that insecure attachment and childhood trauma, independently, have also been associated with poor mental health outcomes (Fearon et al., 2010; Groh et al., 2012, 2014). The simultaneous co-occurrence of these factors has not been investigated previously using profiling (that could enable the potential targeting of treatment interventions) and so we sought to explore this relationship.

Therefore, there is potential for the co-occurrence of these distinct factors to result in specific profiles of individuals who are at an increased risk of experiencing poorer mental health. The composition of these profiles may depend on the combination of epistemic stance, attachment dimension, and childhood trauma. By comprehending the collective associations among these factors and identifying potential subgroups of individuals with different constellations of these factors, in line with previous research on independent factors, we can enhance our understanding of the susceptibility and risk factors for poor mental health.

Traditional, regression-based, variable-centred methodologies significantly contribute to elucidating relationships between factors. However, person-centred approaches hold the potential to further our comprehension of the intricacies of intersecting factors, thereby offering novel insights into their interplay (Smyth et al., 2022). Cluster analyses, in which efforts are made to distinguish subgroups of individuals within a sample possessing shared attributes across 'indicator' variables, may furnish representations of the concurrent existence of epistemic stance, attachment, and childhood trauma, thus forming distinct profiles of individuals. These identified subgroups could potentially correlate with variances in mental health outcomes, as well as disparities in readily discernible characteristics like sociodemographic factors.

The capability to identify profiles with a higher propensity towards poorer mental health outcomes could be instrumental in informing preventative strategies and tailoring interventions for high-risk groups. For instance, targeted interventions could be designed based on the individuals' distinct profile, aiming to specifically manage the challenges inherent in their characteristics, such as a possible predisposition towards high levels of epistemic mistrust and a history of childhood trauma. It has been posited that psychological interventions for individuals with substantial levels of epistemic disruption may necessitate specific adaptations fostering the capacity for social learning (Bateman et al., 2018). A key objective of this study is to delineate a more precise portrait of such individuals' profiles, facilitating the personalisation of treatment modalities.

Previous applications of clustering approaches have successfully identified subgroups based on attachment dimensions (Vaillancourt-Morel et al., 2021) and childhood trauma (Uttinger et al., 2016). These efforts yielded four profiles that were considered statistically distinct from each other based on individual constellations of attachment dimensions (34.5% secure, 41.8% preoccupied, 7.6% dismissive and 16.2% fearful), with varied degrees of mental distress for those with trauma included within the profiling (including comorbid mood and anxiety disorders, as well as PTSD for those in the polytrauma group) observed across profiles. Nevertheless, there has been a dearth of studies that integrate these measures with epistemic stance to investigate potential subgroups spanning these three factors. Knowledge of such subgroups would provide further insight into the interrelationship

between these factors, particularly where to the knowledge of the authors, no study has previously explored this.

Accordingly, the present study sets out with three primary aims: 1) to identify distinct clusters of individuals in terms of their epistemic stance, attachment dimensions, and history of childhood trauma, 2) to examine the differences in sociodemographic factors across profiles, and 3) to investigate potential mental health disparities between these profiles.

2. Methods

2.1. Participants

The dataset used for this analysis included 500 participants who took part in the first study described in Campbell et al. (2021), and were the sample used to derive the original factor structure of the Epistemic Trust, Mistrust and Credulity Questionnaire (ETMCQ). Participants were recruited through the digital survey platform Prolific (<https://www.prolific.co>), and sampling was stratified to achieve a representative sample of the United Kingdom's population distribution regarding ethnicity, gender, and age. Inclusion criteria were: aged over 18, currently residing in the UK and proficient in written and spoken English. Questionnaires were created in and hosted by Qualtrics, and were presented to participants in a random order. The response rate of the survey was 99.8%. The original study was approved by the University College London Research Ethics Committee (reference 14285/002).

2.2. Measures

The ETMCQ (Campbell et al., 2021) is a 15-item self-reported measure of three components of epistemic stance: trust, mistrust and credulity. The questionnaire uses a 7-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (7). Subscale scores (for epistemic trust, mistrust and credulity) are calculated by averaging the relevant items for each subscale. The three subscales demonstrated good internal consistency (Cronbach's α trust = 0.81, mistrust = 0.70 and credulity = 0.75) and test-retest reliability within the dataset (Campbell et al., 2021).

The Experiences in Close Relationships-Revised (ECR-R; Fraley et al., 2000) is a 36-item self-report measure of adult attachment style. Two attachment constructs are measured as separate subscales using the ECR-R: attachment-anxiety and attachment avoidance. A 7-point Likert scale is used ranging from "Strongly disagree" (1) to "Strongly agree" (7) and has excellent internal consistency (Sibley and Liu, 2004), where Cronbach's α avoidance = 0.95 and anxiety = 0.93 in the original study. Following the method used in the initial publication (Campbell et al., 2021), the one participant that missed ten items on the ECR-R scale was removed from the analysis. Thirteen participants that missed one item had their missing item values replaced by the subscale mean.

The Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994) is a 28-item self-report questionnaire that has been validated for both clinical and non-clinical populations. A 5-point Likert scale is used ranging from "Never" (1) to "Very often" (5), in which individuals are asked if and how often they may have experienced emotional, physical or sexual abuse and emotional or physical neglect in their childhood. Subscale scores (for emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect) are calculated by summing the relevant items for each subscale. The questionnaire has good internal consistency (with Cronbach's α ranging from 0.71 to 0.95 for each of the subscales) and good construct validity.

The Brief Symptom Inventory (BSI; Derogatis, 1993) is a 53-item measure that captures symptoms of psychiatric disorders through self-report, using a 5-point Likert scale from "Not at all" (0) to "Extremely" (4). The BSI has been used widely in studies with both non-clinical and clinical populations (Derogatis and Melisaratos, 1983), with strong internal consistency (Cronbach's α = 0.97), construct validity and reliability observed (Urbán et al., 2014). The BSI has nine

subscales for the following symptom dimensions: somatisation, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. In addition, three global indices of distress are used: Global Severity Index (GSI), Positive Symptom Distress Index, and Positive Symptom Total (Derogatis, 1993).

General Self-Efficacy (GSE; Schwarzer and Jerusalem, 1995) was measured using a 10-item scale which measures individuals' beliefs about whether they can manage novel or challenging tasks and cope with adversity. A 4-point Likert scale is used from "Not all true" (1) to "Extremely true" (4). Good internal consistency (Cronbach's $\alpha = 0.90$) was observed in the initial study (Campbell et al., 2021).

In addition to the measures described above, all participants provided information about categorical sociodemographic factors that are detailed in Table 1.

2.3. Analysis plan

Latent variable mixture modeling (LVMM; Berlin et al., 2014) was used to identify subgroups of individuals based on their self-reported epistemic stance, childhood trauma and attachment dimensions. LVMM is a means of identifying distinct clusters of individuals within a population sample (Berlin et al., 2014). Latent class analysis (LCA) was originally developed for categorical indicator variables, before being extended through latent profile analysis (LPA) to use continuous indicators (Goodman, 1974; Hagnaars and McCutcheon, 2003; Lazarsfeld and Henry, 1968). Whilst a number of clustering approaches exist for identifying subgroups, such as k-means or hierarchical clustering, the benefit of LVMM is that model fit statistics are provided which help enable decision making about the optimal clustering solution (i.e. the number of clusters in the data), but LVMM approaches are also less vulnerable to outliers and extreme scores (Magidson and Vermunt, 2005; Saunders et al., 2020; Schreiber and Pekarik, 2014). Within this study's analysis, scores from two subscales of the ETMCQ (mistrust and credulity), two subscales of the ECR-R (anxious and avoidant) and the total score of the CTQ were used as indicators of profile membership. The trust subscale of the ETMCQ was not used as it was anticipated that it would operate in a different direction to the five other measures, which would reduce the clarity of the identified profiles.

The LVMM was conducted in R (R Core Team, 2022), using the package 'mclust' (Scrucca et al., 2016). All five indicators were normalised before the LPA, and the package uses an expectation-maximisation algorithm for parameter estimation. To produce the best-fitting model, the distribution, volume, shape, and orientation of the class-specific variance (the error terms) are varied for each individual class solution and selected based upon the lowest

Table 1
Demographic variables.

Demographic Variable	Categories
Age	Age bands include: 18–29, 30–39, 40–49, 50–59, >60 and prefer not to say.
Annual household income	<£15,000, £15,001–£19,999, £20,000–£29,999, £30,000–£39,999, £40,000–£49,999, £50,000–£59,999, £60,000–£69,999, £70,000–£99,999, £100,000–£149,999, >£150,000 and prefer not to say. This was collapsed to <£30,000 (the largest category), £≥£30,000 and prefer not to say, to manage categories with particularly small samples.
Education level	Secondary, university degree and postgraduate.
Ethnicity	White, Asian or Asian British, Black/African/Caribbean/Black British, Mixed/Multiple ethnic groups, Other/Prefer not to say. This was collapsed to White (the largest category), minority ethnicity/other, to group together categories with particularly small samples.
Gender	Female, male, non-binary and prefer not to say.
Relationship status	Married/in relationship, single/widowed/divorced, prefer not to say.

Bayesian Information Criteria (BIC), and Integrated Completed Likelihood (ICL) criterion values as per established guidance (Bertoletti et al., 2015; O'Driscoll et al., 2021). Furthermore, the Log-likelihood and Bootstrap Likelihood Ratio Tests (B-LRT) were calculated to further support model fit decision making, comparing whether the solution with a more specific number of classes was more optimal than one with fewer (i.e. K classes vs K-1 classes). The likelihood-ratio test (LRT) is used as part of this to assess the goodness of fit of the two comparable models, based upon the likelihood of their ratios. Simulations have shown that BIC and B-LRT are the optimal indicators of the number of profiles within these modeling approaches (Nylund et al., 2007).

Following the identification of the best fitting profile solution, exploratory analysis that compared the profiles on other measures (the BSI and GSE) as well as sociodemographic factors was conducted. Chi-square tests of independence used for categorical variables, and independent samples t-tests for continuous variables as well as η^2 values to calculate effect size differences. Finally, differences in mental health (assessed with the BSI) and self-efficacy (GSE) between profiles was explored using linear regression analysis, controlling for measures and sociodemographic factors that were found to differ between profiles. These analyses were conducted in Stata 16 (StataCorp, 2019).

3. Results

3.1. Descriptive statistics

Descriptive statistics are presented in Table 4, indicating that just over half the sample reported being female ($n = 255$; 51%), predominantly from white ethnic groups ($n = 403$; 81%) and the >60 age group was the most common ($n = 129$; 26%), followed by the youngest group (18–29; $n = 100$; 20%). Most participants had a university degree ($n = 221$; 44%) and separately, had a combined household annual income of >£30,000 ($n = 271$; 54.3%).

3.2. Latent profile analysis

Model fit statistics for the LPA models are provided in Table 2. Decreases in the BIC and ICL values were observed from the 1-profile solution to 4-profile solution, before an increase was observed in the 5-profile solution, indicating that the $K = 4$ model was most appropriate. When considering the B-LRT statistic, significant p-values (<0.05) were observed up to the 6-profile solution, which were no longer statistically significant ($p = 0.064$). The more parsimonious 4-profile solution was considered the most appropriate for the data given the BIC and ICL values, and participants were therefore assigned to the profile they had the highest conditional probability of membership to.

Table 3 shows the mean indicator scores for each profile, where Table 4 presents full descriptive statistics between the profiles, with graphical representation of the LPA solution as defined by their standardised average scores on the five indicator variables provided in Fig. 1.

The four distinctive profiles revealed by the analysis can be characterised as follows:

Profile 1 (LP1; high anxious/avoidance, high trauma, high mistrust/credulity): Constituting 15% of the dataset, this profile was marked by individuals with the highest scores across all measured indicators. These individuals demonstrated above-average scores on both anxiety and avoidance attachment dimensions, as well as measures of epistemic mistrust and credulity. However, the childhood trauma scores for this group were especially high, indicating above-average levels of reported trauma.

Profile 2 (LP2; medium anxious/avoidance, medium trauma, medium mistrust/credulity): This profile, representing 62% of the dataset, was the most prevalent within the sample. Individuals within this profile exhibited average scores on both anxious and avoidant attachment dimensions, childhood trauma, and measures of epistemic mistrust and

Table 2
Latent profile analysis model fit statistics.

Profile Solution	Geometric Model	BIC	ICL	Log-likelihood	Entropy	B-LRT p-value	Classification (% per profile)
1-Profile	VEE	−6638.381	−6638.381	−3257.065	n/a	n/a	–
2-Profile	VVE	−6425.184	−6551.081	−3116.297	0.650	0.001	57/43
3-Profile	VVE	−6417.286	−6613.895	−3078.179	0.637	0.001	37/35/28
4-Profile	VEE	−6411.343	−6533.865	−3078.313	0.632	0.002	14/62/15/9
5-Profile	VEE	−6418.628	−6589.812	−3060.212	0.637	0.001	15/14/15/46/9
6-Profile	VEE	−6425.667	−6663.38	−3041.987	0.679	0.064	19/21/14/15/10/21

Note. Geometric Model: Shape, Volume & Orientation. V = Variable, E = Equal. BIC = Bayesian Information Criterion. ICL = Integrated Completed Likelihood (ICL). B-LRT = Bootstrap Likelihood Ratio Tests.

Table 3
Profile indicators and group differences.

Measure		Full Sample (n = 499)	LP1 (N = 74, 15%)	LP2 (N = 310, 62%)	LP3 (N = 71, 14%)	LP4 (N = 44, 9%)	Comparative statistic (F/X ²), p-value, η ²
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	
ETMCQ	Mistrust subscale	3.62 (0.78)	4.10 (0.86)	3.65 (0.69)	3.72 (0.46)	2.42 (0.45)	F = 60.32, p < 0.001, 0.268
ETMCQ	Credulity subscale	2.75 (0.88)	3.10 (1.02)	2.84 (0.86)	2.42 (0.64)	2.04 (0.49)	F = 20.09, p < 0.001, 0.109
ECR-R	Anxious subscale	3.27 (1.34)	4.25 (1.36)	3.57 (1.11)	1.87 (0.55)	1.76 (0.57)	F = 100.44, p < 0.001, 0.378
ECR-R	Avoidance subscale	2.84 (1.17)	3.66 (1.18)	3.09 (1.01)	1.72 (0.52)	1.52 (0.43)	F = 87.00, p < 0.001, 0.345
CTQ	Total score	39.82 (14.49)	68.38 (10.81)	36.88 (7.80)	30.03 (4.10)	28.27 (2.91)	F = 433.41, p < 0.001, 0.724

Notes: LP1 (high levels of mistrust and low scores on all other measures), LP2 (average scores on all measures), LP3 (highest scores on all measures), and LP4 (lowest scores on all measures).

credulity.

Profile 3 (LP3; low anxious/avoidance, low trauma, medium mistrust/credulity): Comprising 14% of the dataset, this profile was characterised by individuals who exhibited lower scores on both attachment anxiety and avoidance dimensions (ECR-R), childhood trauma (CTQ), and epistemic credulity. Yet, these individuals displayed higher levels of epistemic mistrust. Notably, the level of epistemic mistrust within this group was proximate to the sample mean, whereas their attachment and childhood trauma scores were significantly lower in comparison to the entire sample.

Profile 4 (LP4; low anxious/avoidance, low trauma, low mistrust/credulity): Representing the least common profile in the sample at 9% of the dataset, individuals within this profile reported below-average scores on all indicators. When compared to the other three profiles, this group recorded the lowest scores on each indicator. Particularly noteworthy is the exceptionally low score for epistemic mistrust in comparison to the sample average.

3.3. Associations between profiles and socio-demographics

Chi-square independence tests were conducted to ascertain if disparities in sociodemographic factors exist between the identified latent profiles; the results are presented in Table 4. Responses marked as 'Prefer not to say' are included in the table, but excluded from comparative statistical analyses due to their small quantities. Only relationship status and education level were found to significantly differ across profiles. Profile 3 (LP3, characterised by lower scores on all indicators except mistrust) and Profile 4 (LP4, characterised by lower scores on all indicators) demonstrated a higher likelihood of being in a relationship compared to Profile 2 (LP2, characterised by average scores on all indicators) and Profile 1 (LP1, characterised by higher scores on all indicators). Additionally, individuals from Profile 1 (LP1) exhibited the highest likelihood of having completed postgraduate education.

3.4. Associations between profiles and mental health

The link between the identified profiles and mental health symptoms was examined, revealing significant differences across profiles on the

Global Severity Index (GSI) and all Brief Symptom Inventory (BSI) subscales, as well as the General Self-Efficacy scale (GSE). These findings are presented in Table 4.

Further exploratory analyses, deploying linear regression models, were undertaken to discern the specific differences between individual profiles. These models were developed for each BSI subscale, the GSI, and the GSE, with these scales serving as dependent variables. The independent variable in these models was the profile, with education level and relationship status incorporated as covariates due to their observed discrepancies across profiles as depicted in Table 4.

Two sets of models were constructed, each employing a different reference category - Profile 2 (LP2, characterised by average scores on all indicators) and Profile 4 (LP4, characterised by lower scores on all indicators) - in order to identify specific variances. The resulting coefficients are provided in the appendix.

The findings suggest that Profile 2 (LP2) had significantly lower scores on all BSI subscales and the GSE compared to Profile 1 (LP1, characterised by higher scores on all indicators), albeit the GSE scores did not demonstrate a significant difference between these profiles. Additionally, LP2 exhibited higher scores on all measures compared to both Profile 3 (LP3) and Profile 4 (LP4).

When employing Profile 4 (LP4) as the reference category, scores of Profile 3 (LP3) did not show significant differences on any measure relative to LP4, but they did display significant variances on every measure compared to both Profile 1 (LP1) and Profile 2 (LP2).

4. Discussion

This investigation discerned four statistically distinct profiles of individuals predicated on the interplay of attachment dimensions, epistemic stance, and childhood trauma. The profiles, namely Profile 1 (LP1; high anxious/avoidance, high trauma, high mistrust/credulity), Profile 2 (LP2; medium anxious/avoidance, medium trauma, medium mistrust/credulity), Profile 3 (LP3; low anxious/avoidance, low trauma, medium mistrust/credulity), and Profile 4 (LP4; low anxious/avoidance, low trauma, low mistrust/credulity), illuminate various configurations of these three factors. Although two profiles, LP3 and LP4, demonstrated lower scores on the ECR-R and CTQ, they displayed divergence in terms

Table 4
Demographic and group comparison statistics.

		Full Sample (n = 499)	LP1 (N = 74, 15%)	LP2 (N = 310, 62%)	LP3 (N = 71, 14%)	LP4 (N = 44, 9%)	Comparative statistic (F/X ²), p-value [†] , η ²
<u>Categorical variables</u>		<u>N (%)</u>	<u>N (%)</u>	<u>N (%)</u>	<u>N (%)</u>	<u>N (%)</u>	
Age band	18–29	100 (20%)	11 (14.9%)	73 (23.5%)	11 (15.5%)	5 (11.4%)	X ² = 14.64, p = 0.262
	30–39	91 (18.2%)	14 (18.9%)	55 (17.7%)	14 (19.7%)	8 (18.2%)	
	40–49	87 (17.4%)	16 (21.6%)	55 (17.7%)	7 (9.9%)	9 (20.5%)	
	50–59	91 (18.2%)	11 (14.9%)	59 (19%)	13 (18.3%)	8 (18.2%)	
	>60	131 (25.9%)	22 (29.7%)	68 (21.9%)	25 (35.2%)	14 (31.8%)	
Annual household income	Prefer not to say	1 (0.2%)	–	–	1 (1.4%)	–	X ² = 7.20, p = 0.066
	Low: <£30,000	201 (40.3%)	37 (50.0%)	128 (41.3%)	25 (35.2%)	11 (25.0%)	
	High: ≥£30,000	271 (54.3%)	35 (47.3%)	167 (53.8%)	38 (53.5%)	31 (70.5%)	
Educational level	Prefer not to answer	27 (5.4%)	2 (2.7%)	15 (4.8%)	8 (11.3%)	2 (4.6%)	X ² = 18.10, p = 0.006 [§]
	Secondary	172 (34%)	29 (39.2%)	99 (31.9%)	28 (39.4%)	16 (36.4%)	
	University degree	221 (44.2%)	19 (25.75%)	154 (49.7%)	31 (43.7%)	17 (38.6%)	
Ethnicity	Postgraduate	101 (20%)	25 (33.8%)	54 (17.4%)	12 (16.9%)	9 (20.5%)	X ² = 1.57, p = 0.666
	White	403 (80.8)	56 (75.7%)	252 (81.3%)	59 (83.1%)	36 (81.8%)	
Gender	Minoritised ethnicity/other	96 (19.2%)	18 (24.3%)	58 (18.7%)	12 (16.9%)	8 (18.2%)	X ² = 8.14, p = 0.228
	Female	254 (51.0%)	43 (58.1%)	163 (52.8%)	32 (45.1%)	16 (36.4%)	
	Male	241 (48.4%)	31 (41.9%)	143 (46.3%)	39 (54.9%)	28 (63.6%)	
Relationship status	Non-Binary	2 (0.4%)	–	2 (0.6%)	–	–	X ² = 32.45, p < 0.001 [§]
	Prefer not to say	2 (0.4%)	–	2 (0.3%)	–	–	
	Married/in relationship	354 (70.9%)	38 (51.4%)	214 (69.0%)	66 (93.0%)	36 (81.8%)	
	Single/widowed/divorced	143 (28.7%)	35 (47.3%)	95 (30.7%)	5 (7.0%)	8 (18.2%)	
	Prefer not to say	2 (0.4%)	1 (1.4%)	1 (0.3%)	–	–	
		<u>Mean (SD)</u>	<u>Mean (SD)</u>	<u>Mean (SD)</u>	<u>Mean (SD)</u>	<u>Mean (SD)</u>	
ETMCQ	Trust subscale	4.23 (0.79)	3.82 (0.95)	4.24 (0.75)	4.29 (0.62)	4.75 (0.66)	F = 14.16, p < 0.001, 0.790
BSI	Somatisation	3.17 (4.55)	6.46 (6.45)	3.07 (4.17)	1.56 (2.72)	0.89 (1.87)	F = 22.09, p < 0.001, 0.118
BSI	Obsessive-compulsive	5.76 (5.10)	8.69 (5.59)	6.10 (5.07)	3.24 (3.45)	2.5 (2.61)	F = 23.10, p < 0.001, 0.123
BSI	Interpersonal sensitivity	3.17 (3.75)	5.77 (4.27)	3.36 (3.69)	1.18 (2.10)	0.64 (1.22)	F = 29.94, p < 0.001, 0.154
BSI	Depressio	1.78 (2.45)	3.92 (3.22)	1.80 (2.27)	0.34 (0.81)	0.30 (0.73)	F = 39.88, p < 0.001, 0.195
BSI	Hostility	2.62 (3.30)	4.62 (4.62)	2.72 (3.12)	1.34 (1.73)	0.61 (0.99)	F = 20.27, p < 0.001, 0.109
BSI	Anxiety	3.55 (4.39)	6.47 (5.91)	3.68 (4.15)	1.54 (2.46)	0.95 (1.36)	F = 24.06, p < 0.001, 0.127
BSI	Paranoia	3.13 (3.80)	6.35 (4.53)	3.10 (3.60)	1.38 (2.33)	0.80 (1.42)	F = 33.87, p < 0.001, 0.170
BSI	Phobia	3.02 (3.91)	4.57 (5.02)	3.28 (3.87)	1.49 (2.23)	1.09 (2.62)	F = 12.25, p < 0.001, 0.069
BSI	Psychoticism	2.59 (3.51)	5.51 (4.24)	2.63 (3.38)	0.73 (1.57)	0.45 (1.15)	F = 35.13, p < 0.001, 0.176
BSI	General score	28.79 (28.76)	52.36 (34.08)	29.74 (27.43)	12.80 (14.09)	8.23 (7.56)	F = 38.65, p < 0.001, 0.190
BSI	Global Severity Index	3.46 (2.67)	5.56 (3.19)	3.49 (2.55)	2.02 (1.34)	1.77 (1.08)	F = 32.45, p < 0.001, 0.179
GSE	Total score	30.98 (4.69)	30.45 (5.17)	30.45 (4.76)	32.58 (4.07)	33.07 (2.92)	F = 7.56, p < 0.001, 0.044

Notes: † The 'prefer not to say' response not included in comparative tests due to low numbers. § Statistical significance confirmed with Fisher's exact test. LP1 (high levels of mistrust and low scores on all other measures), LP2 (average scores on all measures), LP3 (highest scores on all measures), and LP4 (lowest scores on all measures).

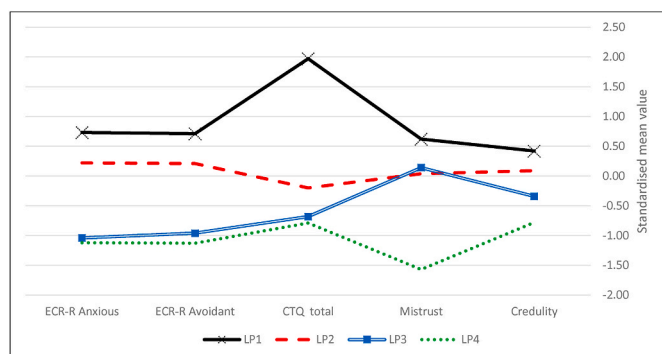


Fig. 1. Visual representation of the 4-profile solution.

of epistemic stance, with LP3 reporting significantly higher levels of mistrust compared to LP4. Conversely, LP1 exhibited higher scores on all indicators, with self-reported childhood trauma being notably high. LP2 maintained average levels across all dimensions, including attachment scores, childhood trauma, and epistemic mistrust and credulity. Variation across profiles was observed in terms of relationship status and education level among the sociodemographic factors examined. Profiles with lower-than-average scores, LP3 and LP4, were more likely to be in relationships, and individuals presenting higher levels of childhood trauma, predominantly within LP1, were more likely to have obtained postgraduate education. LP1, which displayed higher average scores on all indicators, reported elevated mental distress scores, including on all BSI subscales and the GSI compared to other profiles. LP2, with average scores on all indicators, scored higher than the profiles demonstrating lower scores.

The observed correlations between attachment, childhood trauma, and epistemic stance values generally align with existing literature (Elkhit et al., 2018; Hanson et al., 2017) which suggests that adversity engenders enduring challenges for social functioning and impairs social learning capabilities. Additionally, the study reconfirms the impact of severity related to social class and mental health issues, providing consistent findings with the existing literature. This consistency supports previous research demonstrating associations between mental health difficulties and their detrimental effect on social functioning (Harvey et al., 2013; Newton-Howes et al., 2008).

The outcomes of this latent profile analysis suggest that individuals exhibiting the highest exposure to childhood trauma within this community sample (LP1) concurrently display the most acute levels of anxious and avoidant attachment styles and the highest degree of epistemic disruption, marked by combination of elevated mistrust and credulity. Moreover, this group reports the highest symptom levels of mental health issues. These findings extend earlier findings from the initial study (Campbell et al., 2021) showing that early adversity, insecure attachment and epistemic disruption are highly associated in a small subgroup of the population. These findings are also in agreement with a recent conceptual framework positing that vulnerability to psychopathology may be underpinned by psychological isolation (Fonagy et al., 2015, 2022). This vulnerability may be born out of difficulties in forming salutogenic (healthy) relationships, which provide emotional support and access to recalibrating social information (through conversation), thus enabling the individual to self-regulate and mentalize themselves and others (Fonagy et al., 2015, 2022)."

Interestingly, although LP3 and LP4 show divergences in factors associated with mistrust, they do not display significant differences in reported severity of mental health symptoms or any of the other outcome measures. The mistrust score for LP3 is near the sample average, while it is significantly lower for LP4. The interpretation of this finding might lie in the possibility that both LP3 and LP4, being lower risk in other domains (childhood trauma and attachment), do not perceive the higher (albeit sample-average) score on mistrust for LP3 as

a risk factor in itself, without interaction with other risks. This implies that moderate shifts in epistemic stance may not be associated with impaired functioning, but rather it is more entrenched epistemic mistrust and/or credulity that impacts functioning (Fonagy et al., 2015). This observation aligns with research indicating that children with either very high or low trust beliefs are at risk for poor mental health and decreased psychosocial functioning (Corriveau et al., 2009; Rotenberg et al., 2005). Children could be less vulnerable to misinformation as they get older (and so become less mistrusting), or perhaps become more cynical with age as their mistrust is compounded. For the group who exhibited higher mistrust but reported lower severity of mental health symptoms (LP3), one characterisation of them could be as high-functioning perfectionists. Such individuals tend to have good outcomes due to being achievement-oriented, but isolate themselves from other people, apart from a few trusted others (Hewitt et al., 2006; Stoeber et al., 2017). Further investigation of this notion with measures that test individual functionality should be an avenue of further exploration.

Emerging research on the link between epistemic stance and clinical outcomes suggests that individuals with substantial epistemic disruption may require specific interventions that address mistrust or hypervigilance to effectively benefit from psychological treatment (Byrne, 2020; Li et al., 2022). The clustering approach employed in this study might aid in identifying individuals (such as those in LP1) for whom a therapeutic approach, as articulated by the three communication systems of psychotherapy (Bateman et al., 2018), could be particularly beneficial. This method is predicated on the assumption that the emergence of epistemic trust, the necessary condition for meaningful social communication, relies on richly mentalizing experiences in psychological treatment that are attentive to providing ostensive cues and allow the patient to feel their subjective state recognised and effectively mirrored back to them (Fonagy et al., 2022).

Significant differences in relationship status emerged among the distinct profiles, with individuals who experienced lower levels of adversity (and consequently demonstrated lower levels of mistrust) being more likely to be in a relationship. This may be interpreted in light of the fundamental role that trust plays in relationships (Fitzpatrick and Lafontaine, 2017), and it complements previous research that has identified an association between childhood adversity and decreased competency in romantic relationships (Labelle et al., 2018). Furthermore, individuals who had attained postgraduate education were predominantly found within the profile characterised by high levels of adversity and extremes of mistrust and credulity. While this study's data does not allow for further exploration of this observation, it might partially be attributable to the sampling procedures employed and the utilisation of a digital survey platform for participant recruitment.

4.1. Limitations

While the present analysis introduces a novel examination of the interplay between epistemic stance, adult attachment styles, and childhood trauma, several limitations should be acknowledged. The sample employed for this analysis mirrors that used in the initial development of the ETMCQ scale, thereby necessitating further validation of both the scale and the identified profiles within additional samples. Whilst the amount of missing data was limited (2.62% of ECR-R scores), the use of mean imputation could potentially bias estimates. The fact that the six indicators utilised in the latent profile analysis were standardised further underscores the need for replication in diverse samples to ascertain the generalisability of these findings. We did not undertake a factor mixture analysis which would have identified latent subgroups with distinct factor structures, although the sample size and measure item set made obtaining substantive findings prohibitive. The current approach did not consider the model classification error which means the results are subject to potential misclassification bias (indicated by the entropy values), and so future research would seek to

employ more advanced 3-step approaches to account for this.

This study employed an online participant recruitment platform, which, while providing a large sample and ample power for the analyses presented, leaves open questions regarding the extent to which the present sample truly mirrors the general population beyond socio-demographic factors. Therefore, replication of the current analysis, supplemented with additional participants potentially sourced from clinical samples, would be enlightening to understand the generalisability of the profiles identified.

The cross-sectional nature of this study inhibits exploration of the directionality of the association between the measured constructs. In addition, the findings must be considered in the context of the different developmental time periods assessed by the measures. Furthermore, recall biases may be present when soliciting participant recollections about past events, such as those surveyed in the CTQ.

5. Conclusions

This paper has identified distinct profiles of individuals based on their intersection of epistemic stance, attachment style and childhood trauma. Using these profiles, key differences between profiles have been identified on both sociodemographic and mental health associated variables. Future research should seek to employ statistical methods to increase the robustness of the findings, replicate these results within a clinical sample, and there is potential for the use of these profiles to inform preventative strategies to improve the mental health and well-being of those at-risk. For example, interventions targeting addressing epistemic mistrust and hypervigilance could be delivered to individuals in LP3 as those who experience greater mental distress. Practical implications include recognising the role of trust in relationships and possibly exploring potential challenges experienced by individuals with postgraduate educations in the context of childhood trauma and attachment.

CRedit authorship contribution statement

H. Delamain: Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **R. Saunders:** Writing – original draft, Methodology, Formal analysis, Conceptualization. **M. Tanzer:** Writing – review & editing, Investigation, Data curation. **P. Luyten:** Writing – review & editing, Methodology. **P. Fonagy:** Writing – review & editing, Methodology. **C. Campbell:** Writing – review & editing, Investigation, Data curation.

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Declaration of competing interest

All authors declare that there are no conflicts of interest.

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N/A.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jpsychires.2024.12.033>.

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