A latent profile analysis of psychosocial factors and trauma exposure in UK students and their association with mental health and academic persistence

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Objective: The prevalence of previous trauma exposure among university students is widespread. Trauma can have a serious impact on students' mental health, university experience, and academic persistence. This is the first study to use latent profile analysis to assess how differing levels of psychosocial variables combine with trauma exposure to draw together psychological profiles among university students. **Method:** N=452 UK students completed a battery of questionnaires from a cross-sectional survey examining the number of traumatic events and psychosocial factors (loneliness, social support, self-efficacy, coping strategies, personality, and resilience) to determine mental health and academic persistence. **Results:** A latent profiling analysis obtained a five-profile solution, demonstrating a unique combination of psychosocial factors and trauma exposure: Distressed (11.2%), Thriving (31.4%), Vulnerable (19.5%), Flourishing (3.5%), Diffident (34.4%). ANOVAs were used to compare scores on the anxiety and depression measures and academic persistence measures between the participants within each profile. Significant differences among profiles were present with the Distressed profile being more at risk for mental health and academic issues and the Flourishing profile demonstrating high levels of trauma exposure and a positive academic experience. **Conclusions:** Given that there is a large proportion of students in higher education reporting previous traumatic experiences, trauma-informed principles are warranted, with a focus on supporting staff to understand the impact of trauma on students' experiences, in an inclusive and non-judgmental way. This study provides a model of the factors involved in fostering psychological well-being and positive university experiences for students who have experienced trauma.

Clinical impact statement

This study suggests that there may be distinct subgroups of university students defined by the number of traumatic events they have been exposed to and numerous psychosocial factors. It provides a model of the factors involved in fostering psychological well-being and positive university experiences for students who have experienced trauma. These findings advance the idea that trauma-informed approaches should be implemented in universities. Such approaches should support staff to understand the role of trauma in students' experiences and should attempt to foster resilience and self-efficacy as well as provide opportunities for authentic social support.

Introduction

The experience of traumatic events among students in higher education is widespread (Read et al., 2014; Wiehn et al., 2018). Such events occur when an individual or someone close to them is faced with a deeply upsetting or threatening situation that puts them at risk of serious harm or death (Muldoon et al., 2019). For some, this may be a singular traumatic event whereas others may have multiple or long-lasting traumatic experiences. The consequence of trauma can create an overwhelming level of stress in which individuals have inadequate internal resources to cope with the demands of the situation (Van der Kolk et al., 2012). While certain situations may be viewed as traumatic, it is recognised that people experience events differently due to many individual, social, and cultural differences (Elliott & Urquiza, 2006). In England and Wales, almost one-third of young people (31.1%) will experience at least one traumatic event by the time they reach 18 (Lewis et al., 2019), the age at which most students enter higher education. Trauma exposure can increase the likelihood of depression, anxiety, and substance abuse (Read et al., 2014; Rytwinski et al., 2013), mental health problems which are common among university students (Duffy et al., 2019). This can increase the risk of maladaptive coping behaviours including binge eating, alcohol

use, and non-suicidal self-injury (Read et al., 2014), and can even lead to post-traumatic stress disorder (PTSD) (Holbrook et al., 2005) and suicidality (Ford & Gomez, 2015).

Negative impacts on learning and student experience

Exposure to trauma can exacerbate already existing challenges that accompany young adult life (Banyard & Cantor, 2004). The transition to university can be increasingly difficult for those with a history of trauma (Davidson, 2017) and can increase the risk of experiencing further disturbing events such as community violence (Galatzer-Levy et al., 2012) and victimization (Fulu et al., 2017). Difficulties with self-esteem and emotion regulation are often psychological consequences of trauma exposure, which can impact a person's motivation and ability to attend to different stimuli (Fasciano et al., 2021). Therefore, engagement and persistence with learning can be affected thus leading to high attrition rates and deferrals (Pereira et al., 2018). Traumatic experiences can negatively impact a person's cognitive and behavioural systems which can make academic tasks such as working to competing deadlines, examinations, and group work, become daunting and stressful (Crosby, 2015; Keller-Dupree, 2013). Unresolved trauma can cause students to become overly self-protective, constantly aware of potential threats and they can find themselves in a constant state of physiological arousal, which can harm learning (Carello & Butler, 2015).

Furthermore, trauma can negatively impact relationships and increase the likelihood of isolation. This can include strained communications with lecturers and other students, influencing group work and other academic activities (Crosby, 2015; Keller-Dupree, 2013). Previous negative experiences in education may lead to an internalized fear of learning and the development of attitudinal barriers which can hinder academic progress (Carello & Butler, 2015). For example, the reception of critical feedback has the potential to lead to re-traumatization (Carello & Butler, 2015). Such examples can compromise a person's sense of safety, in which cognitive resources are spent on risk monitoring and therefore distract the

individual from learning. Furthermore, the effects of the COVID-19 pandemic and the transition to online and hybrid learning models have likely exaggerated the effects of trauma due to disruption to routines and increased isolation for many students (Adams-Clark & Freyd, 2021).

Creating a positive student experience

Trauma-exposed students, given the right support, can and do often succeed in higher education. University support services are the first port of call; however, these are often in high demand and have a "one-size-fits-all" approach which may not be sufficient to meet individual student needs. While individualised interventions may be better suited, time and financial constraints can prevent these from being implemented on a wider scale (Davidson et al., 2017). Adopting trauma-informed principles such as self-compassion and compassion towards others, encourages students to cultivate productive relationships, embrace a growth mindset, and develop an improved sense of self (Theron & Theron, 2014; Wall; 2021). Stamp et al. (2015) also found that the psychological well-being of university students was strengthened through increasing resilience; the ability to adapt positively to maintain or regain good mental health despite experiencing adversity. Resilience is a key protective factor for academic success and well-being after trauma (van Hoek et al, 2019), however, is not easily achieved by all. The ability to develop resilience can differ due to a variety of factors including personality traits, resources available and coping strategies. Resilience can change with age and life experiences (Hirano, 2020). The Multi-System Model of Resilience (MSMR) (Liu, Reed & Girard, 2017; Liu, Reed & Fung, 2020) looks at the dynamic nature of resilience in relation to factors within (e.g., personality traits) and between (e.g., social aspects) individuals as well as considering additional socio-ecological factors (e.g., higher education settings) (Lui et al, 2017). For students that have been predisposed to trauma the demands of higher education students can raise the risk of maladaptive coping mechanisms,

and hinder the development of resilience. Understanding the psychosocial factors that influence academic and mental health outcomes is an important step towards understanding how trauma-informed approaches in higher education can help foster student resilience.

The present study

There is growing evidence of intrinsic links between trauma exposure and a variety of psychological and social factors including maladaptive coping strategies (Galatzer-Levy et al., 2012); increased loneliness and lower social support (Kao et al., 2014); low self-efficacy (Nygaard et al., 2017); and personality traits: neuroticism (Borja, Callahan & Rambo, 2009) and extraversion (Zhang et al., 2018). These factors can increase the likelihood of poor psychological, social, and academic outcomes, and when combined can greatly exacerbate an individual's propensity for distress (Kao et al., 2014) particularly when coupled with a traumatic history (e.g., Borja, Callahan & Rambo, 2009). Psychological well-being and academic outcomes in young adults are often a result of complex relationships between those psychosocial factors (Carello & Butler, 2015; Fasciano et al., 2021). Examining how these factors interact with trauma exposure will help determine the necessity for trauma-informed approaches in higher education and help inform how university staff can best support their students.

Therefore, the current study aims to 1) establish the extent of trauma exposure in the student population and 2) explore how psychosocial factors and trauma exposure influence academic persistence and mental health in a sample of UK higher education students. This exploratory study is the first to attempt to draw together psychosocial profiles with trauma exposure in UK university students and to propose a model of the factors involved in fostering psychological well-being and positive university experiences for students who have experienced trauma. The following research exploratory questions were addressed:

1. What is the extent of past traumatic experiences in a sample of UK students?

2. How do psychosocial factors relate to different levels of trauma exposure to determine groupings of students?
3. How are these trauma and psychosocial groupings associated with mental health symptoms and aspects of academic persistence?

Method

Design

A cross-sectional online questionnaire-based study was implemented comprising of questions assessing the prevalence (number) of significant traumatic events and levels of perceived loneliness, self-efficacy, extraversion, emotional stability, conscientiousness, and social support. Outcome variables were participants' perceptions of academic integration, social integration at university, commitment to studies, and symptoms of anxiety and depression.

Data

Students from universities across the UK were recruited through social media pages, institutional course participation schemes (e.g., SONA), and dedicated recruitment websites (callforparticipants.com) to complete self-report questionnaires delivered using the JISC online surveys. Data were examined for duplicate responses based on matching IP addresses and none were found. N = 457 began the survey, N = 4 did not provide consent, and N = 1 did not complete all questionnaires. Students who requested course credit were remunerated on completion. In accordance with the British Psychological Society's Code of Human Research Ethics, the study was approved by the University's Research Ethics Committee, and all participants provided online informed consent before data collection.

The final sample comprised 452 participants aged between 18 and 58 years (Mean = 24.84, SD = 8.83). The sample comprised 85.9% (n=388) females and 13% (n = 59) males, (5 not stated). The ethnicity of the sample was predominantly white (n = 403, 90.2%), although 4.9% (22) Asian/ British Asian, 2.5% (n = 11) mixed ethnicity, 1.6% (n = 7) Black/ Black

British, 0.7% (n = 3) Chinese, 0.2% (n = 1) 'other' ethnicity, and 1.1% (n = 5) did not state ethnicity. Most of the sample was from the Northeast region (82.3%, n = 372) 8.2% (n = 37) East Midlands, 6% (n = 27) Yorkshire and the Humber, 0.9% (n = 4) Northwest, 0.7% (n = 3) Southeast, 0.7% (n = 3) Southwest, 0.4% (n = 2) West Midlands, 0.4% (n=2) Scotland, 0.4% (n = 2) was not stated. Most students were undergraduates 93.8%, (n = 423), and 5.8% (n = 27) were postgraduates (n = 2 not stated). Over half were working, caring, or volunteering 59.7% (n = 268) and half (50.9%, n = 230) had previously accessed a mental health service.

Measures

Profiling variables

Traumatic events. Participants were asked to indicate if they had experienced any of a list of eleven traumatic events taken from the Brief Trauma Questionnaire (BTQ; Schnurr et al., 1999) including an additional question on the experience of intimate partner violence as this is commonly reported in students (Voth Schrag & Edmond, 2018). Participants indicated 'yes' or 'no' for each event, this was summed to provide a total score between 0-11.

Loneliness. This construct was assessed using the 20-item UCLA loneliness scale version 3 (Russell, 1996). On a five-point scale (0 = not at all true, 4 = all the time true), participants responded to items such as "How often do you feel left out" and "How often do you feel that you have a lot in common with others?" Scores were summed and ranged between 0-80. Higher scores indicated increased loneliness and reliability was good (α= .86).

Social Support. Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, et al., 1988) is a 12-item questionnaire with three subscales pertaining to social support from family, friends, and significant others with each item scored on a 7- 7-point Likert scale (0 = very strongly disagree to 6= very strongly agree). Higher scores indicated higher perceived social support, with summed scores on each subscale of between 0 and 24. Internal consistency of the scales was calculated as good to excellent (α = .85 to .91).

Resilience. The Brief Resilience Scale (BRS, Smith et al., 2008) contains six items asking about the extent to which respondents agreed with statements that assessed their psychological resilience and ability to recover from stressful situations on a five-point scale (0= strongly disagree to 4 =strongly agree). The sum of all items ranged between 0-24; with higher scores indicating higher resilience. The scale had excellent reliability ($\alpha = 0.89$).

Personality traits. Ten-item Personality Inventory; (TIPI; Gosling, 1997), is comprised of 10 items each consisting of a pair of descriptors that were scored from 0 = strongly disagree *to 6* = strongly agree). Each dimension of the Big Five is represented by two items: one stated positively and the other negatively. Given previous research examining links between personality traits and well-being in educational contexts (Lewis & Cardwell, 2020; James, Hassoulas & Umla-Runge, 2023) the current study focused on extraversion ($\alpha = 0.74$), conscientiousness ($\alpha = 0.69$), and emotional stability ($\alpha = 0.66$). Scores were summed and ranged between 0 and 12 for each trait.

Self-efficacy. The general self-efficacy scale was implemented (Chen, Gully, & Eden, 2001), an 8-item measure assessing participants' perceptions of their ability to perform tasks across a range of contexts on a five-point scale (0= strongly disagree to 4 =strongly agree). Total score was calculated as the sum of all items and ranged between 0-32, with higher scores indicating higher general self-efficacy. The scale had excellent reliability ($\alpha = 0.92$).

Outcome variables

Mental Health. Symptoms of Anxiety and Depression were measured using the Hospital Anxiety and Depression Scale (HADS, Zigmond & Snaith, 1983); The HADS comprises 14 items each with 4 answers between 0 and 3 (positively worded items are reverse scored). Seven items measure anxiety ($\alpha = 0.83$) and 7 items measure depression ($\alpha = 0.82$). Scores were summed for each scale with higher scores indicating increased symptoms.

University experience. Three subscales of the College Persistence scale (CPS, Davidson,

Beck & Milligan, 2009); Academic integration (AI; 8 items); Social integration at university (SI; 8 items) and Commitment to studies (CS; 5 items) were used to assess aspects of participants university experience. These subscales were deemed most relevant to UK students and the outcomes of interest in the current study. The wording was adapted to British terms where necessary (e.g., 'university' instead of 'college'). Two items (4,7) from academic integration and two items from social integration (7,8) were removed prior to analyses due to low item-total correlations. Response options lay on a five-point scale (0 = not at all, 4 = very much so), with negatively worded items reverse scored. Items were summed to provide three subscale scores with higher scores indicating more positive experiences. The final subscales (AI; 6 items; SI; 6 items and CS; 5 items) were internally consistent (α = between .75 to .83).

Statistical analyses

Data were cleaned and scored in SPSS v.26.1, and JAMOVI v2.4 (The Jamovi Project, 2023) was used to conduct inferential statistical analyses. Data were missing on ≥1 variables for N=14 participants (<1% of total data). Given the binary responses to the BTQ, listwise deletion was chosen over multiple imputation to avoid miscalculation of trauma exposure data. All available data was included in analyses, however this method resulted in N=438 for the LPA and ANOVA. As an apriori G*power analysis (F^2=0.2; power=0.8, alpha=.05) indicated a required sample size of N=355, N=438 was deemed acceptable. Data are available at OSF.io (Allen, 2024).

Pearson's bivariate correlations were first conducted to assess the relationships between each of the profiling variables and outcome variables. JAMOVI 'snowRMM' module, implementing R' based packages 'tidyLPA' and 'mclust' were used to conduct a latent profile analysis (LPA) (Rosenberg et al., 2021) to classify participants based on clustering of responses to ten latent variables (Trauma, Social support from friends, family

and partners, Self-efficacy, Resilience, Loneliness, Extraversion, Emotional stability, Conscientiousness). LPA is used to assess how unique combinations of continuous factors cluster together to form homogenous profiles within a sample (Wardenaar, 2021). Several model fit indices; the Akaike information criterion (AIC), the Bayesian information criterion (BIC), the sample size-adjusted BIC (*Adj*BIC), and the bootstrap likelihood ratio test (BLRT) (Oberski, 2016; Tein et al., 2013) were assessed. As recommended (Nylund et al., 2008), the optimal model was indicated by smaller BIC, standardized *adj*BIC and AIC values with the highest number of profiles, a significant p-value for BLRT; and entropy values exceeding 0.8. However, the meaningfulness and interpretability of the profiles were considered the most important when deciding on how many profiles to retain (Wardenaar, 2021).

As the profiling variables were measured using different scales all 10 profiling variables were converted to standardized Z-scores (with a mean of 0 and SD of 1) to facilitate a clear comparison between profiles. To validate the profiles one-way ANOVAs were conducted to determine that the profiles differed significantly from one another on the profiling variables. One-way ANOVAs were then used to assess differences between the individuals assigned to each profile on the mental health and academic outcome variables.

Results

Frequency of Trauma exposure

Three-quarters of our sample (N =342; 75.6%) reported experience of at least one traumatic event (Mean = 2.23, SD = 1.98, range = 0-9). n=193 (42.7%) reported unwanted sexual contact, n = 167 (36.9%) intimate partner violence, n = 143 (31.6%) physical assault as adult, n=132 (29.2%) witnessed violence, n=118 (26.1%) seriously injured, n = 112 (24.8%) childhood physical abuse, n =54 (11.9%) violent death of family/friend, n = 49 (10.8%) serious accident in car /at work, n= 28 (6.2%) life-threatening illness, n = 9 (2.0%) major disaster, n = 4 (0.9%) work in warzone.

Relationship between variables

Table 1 shows descriptive statistics and bivariate correlations indicating the strength and direction of relationships between all variables measured in the current study.

[Table 1 here]

An LPA examined profiles based on combinations of the ten profiling variables. Table 2 provides a summary of the model fit indices for 2- through 6-profile solutions.

[Table 2 here]

Results demonstrated that the 5-profile solution met the criteria for all relevant fit indices assessed and was the preferred solution due to the practical meaningfulness of the resulting profiles High and low levels of trauma were not as distinct in the 3 and 4-profile solutions. Figure. 1 shows the standardised mean scores of the variables for each profile.

[Figure 1 here]

Profile 1 (n =148, 34.4% of the sample), labelled as 'diffident' was the largest group in the study comprised of marginally below average levels of trauma, self-efficacy, extraversion and conscientiousness, low resilience and emotional stability, slightly above average levels of loneliness, support from friends, family, and partners. Profile 2 (n = 48, 11.2%) was labelled 'distressed' and was characterised by above-average levels of trauma, very low resilience, self-efficacy, support from friends, conscientiousness, and emotional stability, lower than average extraversion and social support from family and partner and very high levels of loneliness. Profile 3 (n = 84, 19.5%), labelled as 'vulnerable', and reported above average levels of trauma, resilience, self-efficacy, conscientiousness, and emotional stability, high levels of loneliness and very low levels of social support, with marginally below average extraversion. Profile 4 (n = 135, 31.4%), labelled as 'thriving', was the second largest group comprising the lowest levels of trauma and loneliness, above average scores on resilience, self-efficacy, all types of social support, extraversion, emotional stability, and conscientiousness. Profile 5 (n= 15, 3.5%) was labelled 'flourishing' and was characterised

by the highest trauma exposure, very high levels of resilience, and emotional stability, above average levels of self-efficacy, conscientiousness, extraversion, and social support from family and partners but marginally below average from friends, and low loneliness.

Profile differences in profiling variables

To validate the profiles, one-way ANOVAs were conducted to assess differences in profiling variables. Table 3 shows these were all significant at $p<.001$. Post hoc comparisons with Bonferroni corrections assessed where differences were significant across the five profiles (the standard alpha value of 0.05 was divided by 10 to account for each set of profile comparisons, e.g., 'profile 1 v profile 2' etc). The level of trauma exposure was significantly higher for the flourishing students in comparison to all other profiles. Levels of trauma did not significantly differ between the diffident and thriving students or between the distressed and vulnerable students. resilience, self-efficacy, and emotional stability scores significantly differed between all profiles apart from the vulnerable and thriving. resilience and emotional stability were highest in the flourishing students, and self-efficacy was highest in the thriving students. Loneliness scores significantly differed between all five profiles, with the distressed students reporting the highest scores and thriving students reporting the lowest.

All types of social support were significantly lower for the distressed and vulnerable students compared to all other profiles. Extraversion was significantly lower in the distressed students than in all other profiles, and highest in the thriving and flourishing students (difference non-significant). Conscientiousness was also significantly lower in the distressed students, but highest in the thriving, flourishing and vulnerable students.

Mental Health and Academic Outcomes

Further one-way ANOVAs were conducted to see how the students assigned to each of the newly validated profiles differed on the anxiety, depression, and academic persistence outcomes. As shown in Table 4 all ANOVAs were significant at $p<.01$. Bonferroni corrected

post hoc comparisons found distressed students had significantly higher anxiety than all other profiles, and the diffident and vulnerable students exhibited significantly higher anxiety than the thriving and flourishing students. Depression was significantly higher for distressed students than all other profiles and the vulnerable and diffident students had significantly higher depression scores than thriving students. Table 4 also shows that academic integration scores only differed significantly between the distressed students (reporting lower scores) and the vulnerable and thriving students. Concerning social integration, thriving students scored significantly higher than the vulnerable, distressed, and diffident students, and the diffident students scored significantly higher than the distressed students. The flourishing students did not differ significantly from any other profile on levels of social integration. Thriving students also scored significantly higher on commitment to studies than the vulnerable, distressed, and diffident students, and the diffident, vulnerable, and flourishing students scored significantly higher than the distressed students who reported the lowest levels of commitment across the five profiles.

Discussion

The current study aimed to ascertain the extent of trauma exposure in a sample of students and to explore how psychosocial factors and levels of trauma exposure are associated with mental health and academic persistence. We established five profiles suggesting apparent subgroups of students; thematically classified as diffident, distressed, vulnerable, thriving, and flourishing, based on distinct combinations of trauma exposure, and psychosocial factors. Our findings tentatively provide a framework for higher education institutions to build on for the implementation of trauma-informed practices.

The extent of trauma exposure among our sample was 75.6%. Although a high rate, this is lower than some other prevalence studies (e.g. Frazer et al, 2009 85% and Padmanabhanunni, 2020 97.6%). This difference could be due to the way trauma exposure is

measured in different studies and the types and ranges of traumatic events that are covered. In our sample, interpersonal trauma was the highest with 42.7% reporting unwanted sexual contact and 36.9% reporting intimate partner violence (IPV). This is higher than found in previous research as Voth et al. (2018) found 27% of their sample had experienced IPV, and previous studies reported between 17.8% and 29.5% of students reporting sexual assaults (Baynard & Cantor, 2004; Padmanabhanunni, 2020; Voth et al, 2018). The high prevalence of interpersonal trauma exposure in our sample is alarming and highlights the need for educational institutions to not only consider trauma-informed approaches but also the specific types of traumas experienced within the implementation of such strategies.

The diffident and thriving profiles (148 and 135 students, respectively) encompassed the largest portion of the sample. Both profiles were characterised by low numbers of traumas. However, the diffident profile was coupled with slightly below-average levels of resilience, emotional stability, and extraversion and slightly above-average levels of social support. This profile likely represents many young people in today's world as they transcend 'emerging adulthood' (Gilmore, 2019), as they anxiously begin to navigate the wider world away from their families and childhood friends and are yet to fully develop a strong sense of resilience or confidence in their abilities (Trouillet, et al., 2009). On the other hand, the Thriving individuals were characterized as extraverted, conscientious, and emotionally stable in terms of personality traits, with high levels of social support, self-efficacy, and resilience and a low risk of loneliness. These different profiles emphasize the importance of personality traits in this context. Individuals with high levels of extraversion are likely participate in more social activities and seek support from others (Yu & Hu, 2022), and those with high emotional stability will have higher self-esteem and are less likely to be anxious and shy (Yu & Hu, 2022). The large number of students fitting the diffident profile highlights the high proportion of students reporting poor psychological well-being, particularly in the aftermath

of COVID-19 (Tang et al., 2022) and these individuals may need further support and guidance with the aim of reducing the threat response of those fitting this profile. It must, however, be noted that in emerging adulthood, emotional stability, conscientiousness, and self-esteem tend to increase (Yu & Hu, 2022), which may suggest these negative outcomes may reduce as students mature.

The distressed and vulnerable profiles both reported an above-average number of traumas coupled with high loneliness and low levels of social support particularly from friends. This clustering of factors may not be surprising given that previous research shows trauma can negatively affect individuals' boundaries and ability to trust others within interpersonal relationships (Van der Kolk et al., 2012). People with a history of trauma also report less contact with, and lower emotional support received from friends and relatives (Wagner, Monson & Hart, 2016). Despite the presence of social networks, a sense of loneliness may still occur which can increase attention to socially threatening stimuli, and lead to a more negative view of self and others (Birkeland & Thorensen, 2021). This may be reflected in the distressed profile which showed low self-efficacy and resilience alongside high loneliness and trauma. The distressed profile also displayed extremely low levels of emotional stability, a trait which in combination with inadequate social support, can contribute to more serious mental health issues (Borja et al., 2009). For example, both social support and neuroticism are two of the most important factors predicting posttraumatic stress disorder (PTSD) (Wagner, Monson & Hart, 2016). Therefore, unsurprisingly within our sample, the distressed profile was associated with the poorest mental health and academic outcomes and individuals fitting this profile should be supported or referred accordingly.

Students in the vulnerable profile exhibited average levels of self-efficacy, resilience, and emotional stability, however, was associated with poor social integration yet high levels of academic integration, coupled with moderate levels of anxiety and depression. This

suggests that trauma-exposed students with these characteristics may require concern despite demonstrating good academic performance. The development of compassionate and safe education environments and strategies to foster peer support may be of particular benefit for students within the vulnerable profiles, to reduce the risk of maladaptive coping strategies (e.g. over-working) which can lead to burnout, university dropouts and chronic mental health concerns (Duffy et al., 2019).

The flourishing profile included the highest number of reported traumatic experiences but also high levels of social support, a below-average risk of loneliness, and particularly high levels of self-efficacy, resilience, and emotional stability. This is contradictory to the findings of other researchers e.g., Baynard & Cantor (2004) who found that higher levels of cumulative trauma were related to negative adjustment in students, similar to our distressed and vulnerable profiles. However, the suggestion that we have a small sub-group of students who fit the flourishing profile is potential evidence of post-traumatic growth, demonstrating individuals who have experienced multiple traumas can become exceptionally resilient, be mentally healthy and succeed in education with the appropriate support and psychological resources (e.g., Li et al., 2014).

It is acknowledged that levels of resilience and self-efficacy greatly differ between the profiles we present, and these are psychological factors widely associated with mental well-being and academic confidence (Li et al., 2014). We know social support plays a major role in the development of resilience and is a protective factor among student samples (Canton, 2021; Li et al., 2014). However, social support, loneliness, resilience, and self-efficacy, are strongly linked to personality traits, particularly extraversion and emotional stability, as reflected here. While personality cannot be targeted through intervention, recognition of these trait combinations in individuals with a history of trauma exposure may indicate where targeted support is required to help students build social networks and develop their resilience

and belief in themselves. Given that a large proportion of students report previous trauma exposure and various psychosocial factors related to their trauma may influence their well-being and university experience, we argue that trauma-informed principles, are warranted.

At the core of trauma-informed approaches lies the need for educators to be compassionate towards the effects of trauma in the academic environment. This includes the potential individual vulnerabilities of their students as well as the potentially retriggering nature of the material they work with (Carello & Butler, 2014). Those classified by the distressed and vulnerable profiles are at the highest risk for mental health issues and university staff should have a clear understanding of the institution's referral systems and should be able to identify students in need. Further, in our sample interpersonal traumas (unwanted sexual contact and IPV) were the most widely reported, educators need to be aware of the power dynamic in the classroom and that such trauma histories may make people susceptible to exploitation by authority figures (Carello & Butler, 2014). Students may also disclose experiences of trauma to staff members, and they must respond appropriately. For example, appropriate staff responses to such disclosures places emphasis on psychological and interpersonal factors within the coping and pursuits system of the MRSR (Liu et al, 2020). Therefore, interventions to develop protective functions of social support through compassionate staff responses (Barnyard et al., 2004) would help to create the right environment for resilience to occur.

With regards to study methodology, the use of reliable validated self-report measures and the relatively large sample size are obvious strengths. However, the measurement of trauma exposure (a) may not accurately quantify trauma, and (b) may have failed to capture other significant events our sample experienced (e.g., poverty, bullying). Although these are common issues when measuring and classifying trauma, they do limit what can be inferred from the findings, and a more comprehensive assessment of trauma exposure in students may

be warranted in future studies. A further point to note is that our sample mainly comprises white-female students from the Northeast of England, potentially due to the self-selecting nature, and location of the research team. As such, the current sample may not be fully representative of the demographics of university students in the UK and caution needs to be given when generalising the findings. Finally, the current study utilised a cross-sectional design, which limits the conclusions that can be drawn regarding causal pathways.

We do appreciate that there are some similarities between our profiling variables and outcomes, for example, emotional stability, anxiety, and depression. However, we argue there is enough meaningful distinction between these factors to avoid confounding. Personality traits are relatively stable constructs, whereas anxiety and depression are symptoms of mental ill health. Further, the purpose of the current study was to specifically examine how the psychosocial characteristics cluster together with trauma exposure, and the data show that not trauma exposure is not always accompanied by low levels of emotional stability, and not all students with trauma or low emotional stability have anxiety or depression.

Nevertheless, these findings provide the foundation for further longitudinal exploration and a basis in which practical implications can be implemented in training and practice. However, to further understand the necessity for trauma-informed approaches we need to explore the views of students themselves, therefore qualitative approaches would be beneficial in furthering this agenda. It must be noted that many students who need mental health support do not wish to speak about their experiences, therefore research, policy, and practice should consider how to engage all at risk.

There is the likelihood that other factors may influence the experience of trauma and profile membership, such as socioeconomic status (SES), which is widely linked to adversity. Future studies should also explore whether certain demographic characteristics (e.g. race,

age, gender, SES) can predict profile membership, to determine if certain individuals are at increased risk of academic or social difficulties during their time at university.

The current study is the first to our knowledge to use LPA to examine how psychosocial variables are related to trauma exposure in UK students, and our findings provide an understanding of how these factors may determine mental health outcomes and academic experience. It is hoped these findings can help inform academic training, policy, and practice in addition to further highlighting the need for trauma-informed approaches to be implemented in universities.

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Table 1. Means, standard deviations and bivariate correlations between profiling variables, academic persistence, and mental health

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	*M*	*sd*	*n*
1.Trauma exposure	—														2.23	1.98	452
2.Resilience	0.09	—													11.78	5.54	452
3.Self-efficacy	0.09	0.44***	—												20.85	5.82	450
4.Loneliness	0.18***	-0.33***	-0.39***	—											31.24	12.13	439
5.Family support	-0.29***	0.10	0.17***	-0.48***	—										14.92	7.23	450
6. Friends support	-0.20***	0.14**	0.29***	-0.59***	0.44***	—									14.80	6.48	452
7.Partner support	-0.08	0.03	0.24***	-0.46***	0.36***	0.39***	—								17.18	6.71	449
8.Extraversion	0.10*	0.28***	0.28***	-0.38***	0.10	0.21***	0.17***	—							5.36	3.19	451
9.Concientiousness	-0.01	0.22***	0.44***	-0.24***	0.13***	0.10*	0.14**	0.07	—						8.18	2.53	451
10.Emotional stability	0.02	0.65***	0.41***	-0.42***	0.19***	0.17***	0.05	0.28***	0.27***	—					5.33	2.97	452
11.Anxiety	0.16***	-0.45***	-0.33***	0.54***	-0.31***	-0.24***	-0.09	-0.20***	-0.16***	-0.60***					11.58	3.44	444
12. Depression	0.15***	-0.35***	-0.39***	0.54***	-0.41***	-0.30***	-0.25***	-0.23***	-0.25***	-0.33***	0.45***				7.74	3.02	447
13. Academic integration	0.07	0.11*	0.32***	-0.11*	0.07	0.24*	0.14**	0.02	0.3***	0.10*	-0.13**	-0.24***			13.00	3.48	449
14. Social integration	-0.09	0.09	0.20***	-0.37***	0.20***	0.40***	0.09	0.25***	0.15**	0.07	-0.14**	-0.24***	0.13**		10.31	5.26	449
15.Commitment to studies	-0.05	0.20***	0.45***	-0.22***	0.13	0.10	0.16***	0.17**	0.46***	0.20***	-0.22***	-0.34***	0.61***	0.08	19.1	4.00	449

$*p < .05$. $**p < .01$.$*** p < .001$

Table 2. Summary of the model fit indices

Profiles	AIC	BIC	Adj BIC	BLRT	Entropy
2	11644.70	11770.68	11672.30	<.01	0.78
3	11472.43	11643.11	11509.82	<.01	0.78
4	11291.46	11506.84	11338.64	<.01	0.79
5	**11247.19**	**11507.28**	**11304.18**	**<.01**	**0.82**
6	11334.73	11707.40	11479.25	<.01	0.74

Note: No model fit indices were provided for a one-profile solution in Jamovi.

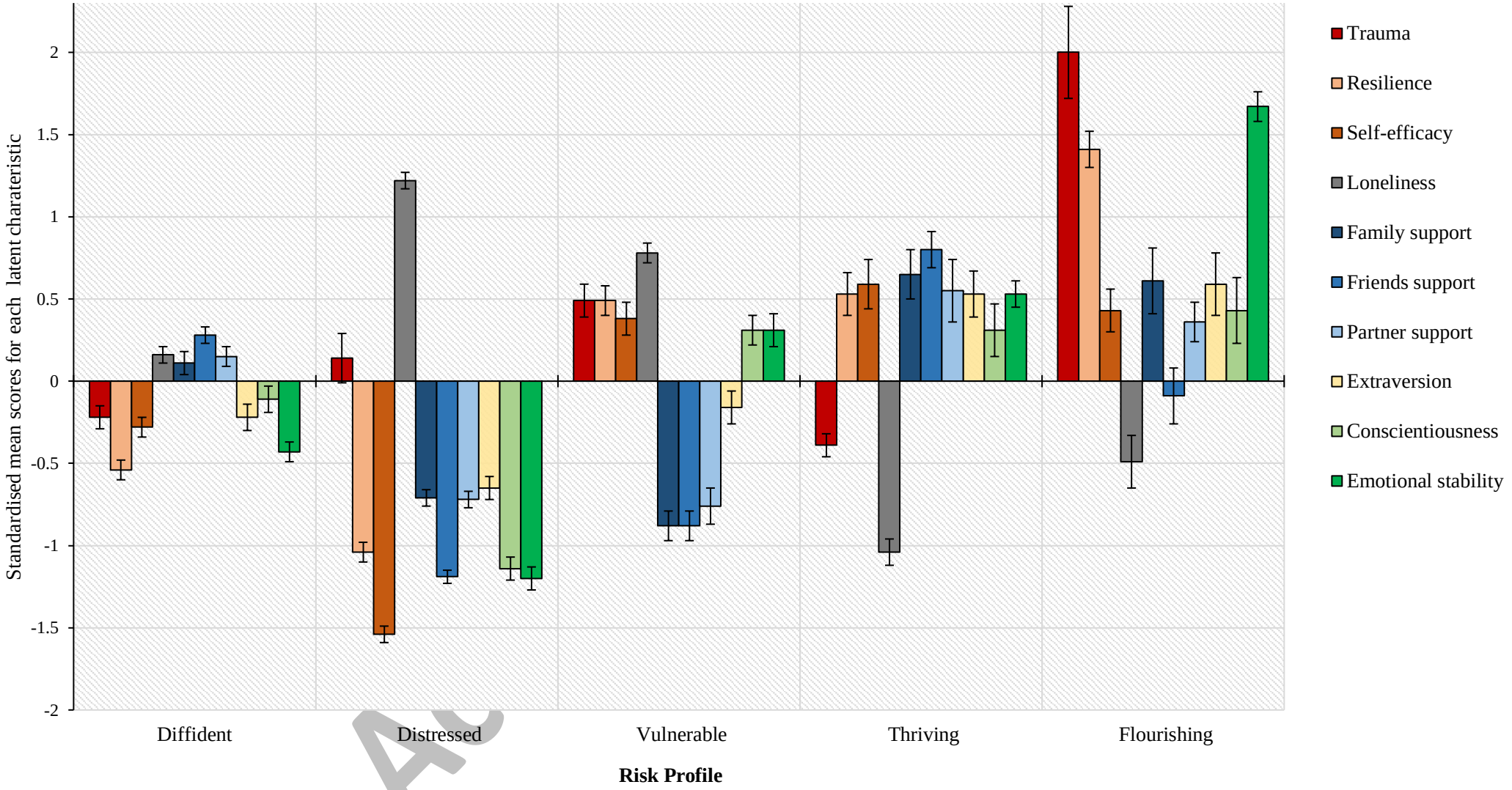

Figure. 1. Standardised mean scores (M = 0, SD = 1) of the different characteristics across the five profiles. Error bars represent standard errors (SE) ± 1.

Table 3. *Means (SEs) of each profile variable across the five profiles, one-way ANOVA (Welch's) statistics and effect size (η^2)*

Profiling Variables	Profile 1 Diffident	Profile 2 Distressed	Profile 3 Vulnerable	Profile 4 Thriving	Profile 5 Flourishing	ANOVA	Effect size
Trauma	1.81^{ac} (0.14)	2.52^{ab} (0.25)	3.20^{b} (0.19)	1.47^{c} (0.15)	6.20^{d} (0.44)	F (4,425) = 36.12***	η^2 = 0.25
Resilience	8.82^{a} (0.25)	6.06^{b} (0.62)	14.50^{c} (0.47)	14.75^{c} (0.37)	19.60^{d} (1.10)	F (4,425) = 76.42***	η^2 = 0.42
Self-efficacy	19.26^{a} (0.36)	11.94^{b} (0.63)	23.06^{c} (0.48)	24.28^{c} (0.38)	23.33^{d} (1.14)	F (4,425) = 81.16***	η^2 = 0.43
Loneliness	33.11^{a} (0.60)	46.00^{b} (1.05)	40.62^{c} (0.79)	18.53^{d} (0.62)	25.20^{e} (1.87)	F (4,425) = 193.55***	η^2 = 0.65
Family support	15.74^{a} (0.47)	9.79^{b} (0.83)	8.57^{b} (0.63)	19.64^{c} (0.50)	19.33^{ac} (1.49)	F (4,425) = 60.43***	η^2 = 0.36
Friends support	16.55^{a} (0.35)	7.04^{b} (0.61)	9.00^{b} (0.46)	19.97^{c} (0.36)	14.13^{a} (1.09)	F (4,425) = 136.37***	η^2 = 0.56
Partner support	18.18^{a} (0.47)	12.29^{b} (0.82)	12.04^{b} (0.62)	20.87^{c} (0.49)	19.53^{ac} (1.47)	F (4,425) = 41.69***	η^2 = 0.28
Extraversion	4.68^{a} (0.24)	3.29^{b} (0.42)	4.87^{a} (0.32)	7.07^{c} (0.25)	7.27^{c} (0.75)	F (4,425) = 21.93***	η^2 = 0.17
Conscientiousness	7.91^{a} (0.19)	5.31^{b} (0.33)	8.95^{c} (0.25)	8.96^{cd} (0.19)	9.27^{acd} (0.58)	F (4,425) = 27.12***	η^2 = 0.20
Emotional Stability	4.07^{a} (0.19)	1.79^{b} (0.33)	6.24^{c} (0.25)	6.90^{c} (0.19)	10.27^{d} (0.58)	F (4,425) = 78.11***	η^2 = 0.42

Means in rows with different superscripts are significantly different at $p < .005$ (Bonferroni corrected).
$*p < .05$. $**p < .01$.*** $p < .001$

Table 4. The effects of profile classifications on anxiety, depression, and academic outcomes across profiles (Means [SD]) including one-way ANOVA (Welch's) statistics and effect size (η^2)

	Profile 1 Diffident	Profile 2 Distressed	Profile 3 Vulnerable	Profile 4 Thriving	Profile 5 Flourishing	ANOVA	Effect size
Anxiety	12.52^{a} (0.24)	15.00^{b} (0.43)	11.73^{a} (0.32)	9.46^{c} (0.25)	7.93^{c} (0.78)	F (4,425) = 42.58***	$\eta^2 = 0.29$
Depression	7.91^{a} (0.22)	10.48^{b} (0.39)	8.65^{a} (0.29)	6.00^{c} (0.23)	6.21^{c} (0.72)	F (4,425) = 30.06***	$\eta^2 = 0.20$
Academic integration	12.68^{a} (0.28)	11.70^{ab} (0.49)	13.52^{ac} (0.37)	13.76^{ac} (0.29)	14.07^{abc} (0.87)	F (4,425) = 4.53**	$\eta^2 = 0.04$
Social integration at university	10.22^{a} (0.40)	7.44^{b} (0.70)	8.62^{ab} (0.54)	12.95^{c} (0.42)	9.40^{abc} (1.25)	F (4,425) = 16.73***	$\eta^2 = 0.14$
Commitment to studies	18.53^{a} (0.31)	16.60^{b} (0.55)	19.37^{a} (0.42)	20.66^{c} (0.33)	19.80^{ac} (0.98)	F (4,425) = 11.82***	$\eta^2 = 0.10$

Means in rows with different superscripts are significantly different at $p < .005$ (Bonferroni corrected).
$*p < .05$. $**p < .01$.$***$ $p < .001$