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Development of a Measure for Assessing Victimisation at UK Universities

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School bullying has been researched extensively, yet research on student bullying at university is still in the early stages and lacks valid measurement instruments. This paper outlines three studies conducted to develop a new scale to measure victimisation and perpetration at university (ultimately focusing on victimisation). Wider bullying literature from the school context and the workplace was consulted alongside an initial qualitative study exploring students' perceptions of university bullying. For Study One, an Exploratory Factor Analysis on data from a sample of UK university students (N = 243) resulted in a reliable scale with four factors: (1) Psychological Victimisation, (2) Physical Act/Trace Victimisation, (3) Social Victimisation, and (4) Direct Verbal Victimisation. After modification, Study Two tested the altered structure of the scale on a new sample of UK university students (N = 304), finding two alternative two- and three-factor models. Study Three tested the competing models from the first two studies using Confirmatory Factor Analysis (N=441), finding the four-factor structure to be the best model out of the three, but with the scale requiring further work. Although none of the fit indices' statistics were ideal, this is the first attempt to design a higher education bullying scale based on a multi-phase approach, which shows potential as a useful tool for measuring victimisation following further research.

Keywords: bullying; students; higher education; UK; factor analysis

Bullying at University

Bullying has been defined as intentionally aggressive behaviour directed at individuals who cannot defend themselves within the context of a power imbalance (Smith, 2004). Volk et al. (2017) further suggested that bullying is perpetrated due to a motivational goal and is not necessarily just a conscious intent to harm. Bullying is still a problem within modern schools (Källmén & Hallgren, 2021), as captured by tools such as the revised Olweus bully/victim questionnaire (Olweus, 2006). Within the workplace, ACAS (2014) define bullying as unwanted behaviour from a person or group that is either offensive, intimidating, malicious or insulting, or an abuse or misuse of power that undermines, humiliates, or causes physical or emotional harm to someone. The occurrence of bullying in universities is less recognised (Myers & Cowie, 2017), which could be due to the lack of substantiated measurement tools. To clarify, bullying is the act of aggression, whereas being victimised is being on the receiving end of the bullying act. Both terms will be used throughout this article.

Researchers who have attempted to record behaviour that is assumed to be bullying at university find that the consequences range from lowered wellbeing (Chen & Huang, 2015), increased stress and anxiety (Seelman et al., 2017), to suicidal ideation and attempts (Schenk & Fremouw, 2012). Bullying is also known to impact academic achievement and disrupt learning (West, 2015), which, in turn, can affect social norms and university culture, leading to a lack of motivation and drop-out.

These researchers have tended to use the same measurement categories for university student populations as are used with school children. However, most students at university are in the Emerging Adulthood phase, the developmental stage between childhood and full adulthood (Arnett, 2015), indicating that there are likely to be differences between childhood, Emerging Adulthood, and adulthood experiences of bullying. Although it is true that some students are mature adults, it is likely that experiences of bullying and victimisation for all students, regardless of age, will be greatly influenced by the majority group of Emerging Adults. Furthermore, the university environment is different from school, adding more potential differences in terms of the types of bullying experienced. Children frequently use physical aggression, whereas adults rarely attack physically. Bullying may evolve as individuals pass through developmental stages. University students sometimes share accommodation with their peers, which is less likely in schools and workplaces, and presents different opportunities for bullying. All of these different factors are likely to have consequences for the types of bullying and experiences of victims within the higher education context. As such, we argue, tailored measurement tools are required to explore university bullying.

Despite a shortage of university bullying research, global studies have evidenced much negative behaviour that is assumed to be bullying and reported similarities to childhood bullying. As researchers are often looking for the same behaviour found amongst school children, they might be missing some other important facets of the university experience.

As yet, there is no consensus on a definition for student bullying, nor much evidence for different types of bullying, but some researchers have recorded bullying experiences based on school measurement tools and definitions. For example, Chapell et al. (2006) surveyed students in the US and found 21% (25 students) of the sample had been bullied at university, and Brock et al. (2014) provided evidence of relational bullying amongst female Australian students. Furthermore, Lund (2017) found that social bullying was common in Norwegian HE, with 9% (291) of students from five

institutions experiencing bullying. Some researchers have reported victimisation prevalence rates of 24% (462 students; Faucher et al., 2014); however, they largely focused on cyberbullying, which is complex and has varying interpretations. For example, Brewer et al. (2014) presented 18 female students from a western US university with ten bullying scenarios (seven of which met the legal definition for cyberbullying), but most students did not correctly identify the cyberbullying scenarios. With most of the student population engaging in online activities, unintentional offences seem to be commonplace on social media, leading to a lack of clarity for students.

Young-Jones et al. (2015) suggested that university students had a constrained view of the meaning of bullying. Their sample of 130 US undergraduates did not consider university bullying to be a problem, although 49% (64 students) indicated they had experienced acts labelled as bullying by the researchers. Students may have perceived some behaviours as insufficiently serious to be classed as bullying. Furthermore, Crosslin and Golman (2014) questioned 54 university students within focus groups about the term cyberbullying. Some saw the term as childish and claimed it did not happen at university, whereas others admitted its existence, but alleged it was ignored.

Consequently, students may not have a collective definition of bullying within HE. They may perceive that bullying does not happen at this level of education, believe that students are mature enough to deal with bad behaviour, or perhaps are unaffected by bullying behaviour so do not wish to class it as bullying. Many Emerging Adults are still developing a coherent identity and so conflicting feelings and opinions may be present within the student community. Likewise, current students are embedded in a different generational culture to the researchers studying them (Kail & Cavanaugh, 2010), and so they may have different influences and social norms (Bronfenbrenner, 1979) shaping their view of bullying. It is clear that bullying at university does exist (Akbulut & Eristi, 2011; Brewer et al., 2014; Harrison et al., 2022). A reliable survey measure, accompanied by a suitable definition, is needed for future research, given the lack of consensus of what constitutes bullying amongst university students. This paper will focus on measuring bullying and the different types of bullying, rather than focusing on the prevalence of bullying and possible associations with other variables. Our aim is to contribute to the development of a reliable scale to investigate bullying in higher education, and to report our progress towards this, rather than to make a theoretical contribution to the bullying literature. We hope that this will initiate further work to refine this initial project, to facilitate future research which will eventually contribute to a deeper theoretical understanding of bullying within the higher education sector.

Measuring bullying at university

As mentioned, it may be incorrect to assume that bullying in school and university contexts are identical, but this has not been adequately recognised in most previous university-focused research (e.g., Chapell et al., 2006). If students are questioned about bullying at university but are given the ready-made childhood bullying categories (social, verbal, and physical), students may alter their reports of experiences to fit these definitions.

However, some researchers have used open-ended questions (e.g., by asking ‘how do you get bullied?’) to gather inclusive data and to avoid forcing students to fit their responses to existing categories (Sinkkonen et al., 2014; Byrne et al., 2016). These methods have uncovered new categories labelled as indirect public, direct verbal,

indirect individual, and physical harassment, showing similarities and differences between Higher Education and school bullying. The subtle differences in their classifications show that perhaps student bullying types should first be explored qualitatively to establish categories relevant to the population being studied, and only then can frequencies of reported behaviours be measured in separate samples. This process would allow for the development of a new scale, accounting for the developmental stage and institutional contexts of students in universities compared to schools, enabling accurate measurement of university students' perceptions, perpetration behaviours, and experiences of bullying behaviour.

Some attempts at creating Higher Education bullying scales were identified, one by Doğruer and Yaratan (2014) and another by Young-Jones et al. (2015). Doğruer and Yaratan explored existing bullying scales and developed a new scale based on the literature. In the scale, they presented a bullying definition and then items from the four categories of verbal, emotional, physical, and cyberbullying (prevalent in school bullying). They surveyed 211 predominantly Turkish students at one Turkish university, conducted Principal Components Analysis (PCA) on the results and extracted four factors representing the four bullying types they imposed. After cleaning the data, 22 items were retained from the original 40, with nine items labelled as relational/emotional, six as verbal, four as cyber, and three as physical bullying.

The second scale, by Young-Jones et al. (2015, p.190) was named the 'perceptions of bullying' scale and was 'based on a review of similar studies', which were not detailed. Their scale was given to 130 undergraduates at one American university. Subscales measured university climate, current bullying experiences (verbal harassment, social exclusion, physical violence, cyberbullying), and past bullying. Unfortunately, factor analysis statistics were not presented, and results were only reported as 'yes' or 'no', which does not capture the complexity of the experience.

Both scales attempted to measure bullying in Higher Education; however, they may not adequately reflect bullying in the Higher Education context as it is unclear what literature they were developed from. As no factor analysis statistics were given, it is impossible to use Young-Jones' findings to inform our study. We therefore attempted to build upon the scale by Doğruer and Yaratan, keeping in mind the categories they used. Firstly, we proposed items from diverse sources (see Method). For analysis, we first explored the data using Exploratory Factor Analysis (EFA) without any prior structure imposed. The data were later tested using a Confirmatory Factor Analysis (CFA) when structural models were clearer. In new scale development, EFA is recommended first (Worthington & Whittaker, 2006) with CFA used afterwards to test that the data are consistent with a hypothesised factor structure (Tinsley & Tinsley, 1987). We used Likert-type scales to record frequencies instead of investigating the presence or absence of bullying, allowing more granular measurement of the prevalence of bullying in Higher Education. This research adopts a holistic stance, seeking to capture the broad range of behaviours within UK Higher Education that could be classed as bullying, including those happening online and on campus, rather than focusing on a specific subtype. We focused on bullying in the UK, as there are likely to be cultural and contextual differences in other countries; for example, researchers focusing on cyberbullying in the US and Canada may adopt a criminological perspective due to legislation, alongside other cultural and social differences between UK and North American nations. Participants were all studying at UK universities to ensure that we were researching institutions governed by similar legislation. It is also wise to first examine our home country culture of student bullying to propose a baseline before comparing to other countries. Any differences we find compared to the Turkish

and American samples (Doğruer &Yaratan, 2014; Young-Jones et al., 2015) may be due to culture and/or differing education systems.

Consequently, this research follows the iterative process of scale development reported in Slaten et al. (2017). We first consulted a previous qualitative study (Harrison et al., 2022) that explored students' perceptions of university-based bullying and identified some similarities and differences between school, the workplace, and university-based bullying. In particular, this study demonstrated that bullying in higher education shares issues in common with that seen in school and workplace contexts, but that bullying within higher education is more nuanced than in schools, is motivated by perpetrators seeking power and to control others, and is frequently minimised or justified in ways that allow its continuation. We noted that sexual harassment was particularly prevalent within higher education, whereas it is less frequently reported in school contexts, and cyberbullying and social exclusion were also found to be important. This confirms that a higher-education specific scale is needed for future research, that school and workplace measures do not sufficiently capture the nature of bullying in higher education, and that previously existing higher education-focused scales may not be adequate in their current form for investigating bullying in higher education.

School, workplace, and existing Higher Education literature were also consulted, and we compared this with our results from the initial qualitative study. Behaviours were collated to develop an initial pool of items deemed suitable for validly representing Higher Education bullying. The scale was created, tested, and developed using three samples to discover the most suitable factor structure and establish reliability. Students were sampled from various UK universities to gather a range of experiences.

Study 1: Scale Development and Exploratory Factor Analysis

The purpose of Study 1 was (1) to develop items to reflect bullying in UK Higher Education, (2) to examine the factor structure of the scale using EFA in SPSS, (3) to delete items that did not load sufficiently, and (4) to evaluate the internal consistency of the scale items using Cronbach's alpha.

Method

Preliminary Item Construction

Following Worthington and Whittaker's (2006) guidelines, we based the initial item pool on the results of our qualitative study exploring students' opinions about bullying types, frequencies, and constructs in UK Higher Education (Harrison et al., 2022) coupled with an examination of published bullying literature (e.g., Fox et al., 2015; Fox & Farrow, 2009; Boulton, 2012) and workplace bullying guidance from ACAS (2014). Some items were repurposed from school items and common categories (such as, verbal, physical, indirect/social/emotional, and cyber), for example, 'been called names' for verbal bullying. Other items were derived from the qualitative study; prominent quotes were used to inform items. Examples included: perpetrators manipulating victims' social status, perpetrators controlling the environment, sexual harassment and stalking, intentionally throwing away housemates' food, playing mind games, and peer pressure. The prevalence of bullying types in Higher Education was unknown and so it

was practical to include many items for later reduction; 41 items were generated. The research team discussed these items and gaps were identified; seven items were added and some were reworded. The second author, an expert in school bullying and current university lecturer, checked content and face validity and identified potential school bullying behaviours that may occur in universities, but were missing from the item pool. The items were also duplicated and reframed to ask about perpetration as well as victimisation. Even though we did not wish to impose a pre-determined factor structure, it was impossible for the first and second author to disassociate themselves from their existing knowledge of bullying categories; consequently, it is likely that this knowledge influenced the decisions of what items were chosen for inclusion.

The first iteration of the scale comprised 48 items (see supplementary Table A) asking about victimisation and perpetration within the past year, "During the last academic year, how often have you experienced the following (e.g. in lectures, halls, social clubs, communal spaces etc.) from other students?", with answers ranging from 1 (*Never*) to 5 (*Multiple times a week*). We specified 'the past year' to capture as many victimisation occurrences as possible, in common with Faucher et al. (2014). It is likely that university bullying is not as frequent as school bullying, where children spend the same time with the same classmates each day. Additionally, memory recall was thought unlikely to be problematic, as Miller and Vaillancourt (2007) argue that some memory bias is expected in all self-report methods, but having a shorter, more recent timeframe may be more biased due to potential upset and rumination. We further included an open-ended question at the end to account for missed behaviours or identity-related reasons (e.g., ethnicity and sexual orientation) for perceived bullying, to enable scale modifications for future research.

Participants

Participants were 329 students from a variety of UK universities; 243 responses remained once incomplete and excluded (i.e., from non-UK university students or from first-year students) responses were deleted. These respondents had completed very little of the questionnaire (e.g., had not progressed past the consent or demographics page) or did not attend a UK university. First year students were excluded from taking part in this first study (stated on the survey information page) due to a lack of university experience as the survey was administered at the start of term; consequently, first years would not have experienced university life at that point and there would have been no opportunity for perpetrators to bully them. The sample comprised 186 females, 54 males, and 3 indicated another gender identity (nonbinary, demi-girl, genderfluid). Ages ranged from 17-54 ($M = 23.92$, $SD = 6.36$). Although females are over-represented, the demographic information collected suggested that diverse and representative samples of the student population were attained for all three studies. For full demographic details, see supplementary Table B).

As factor analysis is an analytic tool and does not intend to generalise inferences about the means from the sample to the population, a prospective power calculation was neither necessary nor plausible. As a rule of thumb, recruiting five to ten people per variable is recommended for pilot studies (Field & Hole, 2003), which equates to a minimum of 240 participants (48 items multiplied by five participants). We foresaw having to delete some partial responses so ensured we collected at least 240 responses, thus allowing for incomplete responses but still retaining the minimum recommended number of participants.

Procedure

For each study, ethical approval was granted by Keele University School of Psychology ethics committee. Current UK university students were eligible to take part (except newly started first years); a convenience sample of participants was recruited via social media (e.g., Facebook, Twitter) and they completed an online questionnaire through Qualtrics. As the study was open to any UK university student, with a desire to acquire participants from a variety of institutions, the optimal way to distribute the survey was through the internet. Data were collected over two months. The participants indicated their consent and proceeded to demographic questions. The survey was very short, so an attention check was not included for survey fatigue. A bullying definition was then given as an objective reference: 'Aggressive, goal-directed behaviour, that harms another individual within the context of a power imbalance (not including within a romantic relationship), that may or may not be repetitive'. This was adapted from the bullying definitions adopted by Volk et al. (2017) and ACAS (2014), and incorporated facets identified as important from Harrison et al. (2022), such as the importance of power, and there being a goal for the bullying. We did not want to record experiences of the items that occurred within romantic relationships but acknowledge that some of the item-behaviours *are* commonly found within romantic relationships. These types of behaviours were reported in our initial focus groups and were classed as bullying by the students (Harrison et al., 2022). By requesting participants not to report incidents from within their own romantic relationships, we hoped the students would only report on the item-behaviours that they experienced from their peers, regardless of whether it was a behaviour that normally happens within romantic relationships. Findings from our previous student focus groups uncovered that abusive behaviours perpetrated by partners were also evident at university amongst student peers.

Results

Only the victimisation results were examined due to insufficient variance within the perpetration scores (discussed later). The 48 victimisation items were explored with Principal Axis Factoring in SPSS v.24 (using default settings) with oblique rotation (direct oblimin) to test the underlying factor structure; it aims to understand latent factors that may account for shared variance amongst items and is ideal for initial validation of new instruments (Worthington & Whittaker, 2006). Direct oblimin rotation also allows for factors to correlate (Kline, 1994; Field, 2009), and correlations have been identified in the literature between different bullying types (Boulton, 2012). Pairwise deletion was requested for the 21 cases of missing data as listwise deletion resulted in a reduction of the sample to below the recommended number. The number of useable responses (243) met the acceptable threshold for pilot work (Kline, 1994; Field & Hole, 2003) and the KMO test for sampling adequacy was high at .93 (Kaiser, 1974). Bartlett's test of sphericity was significant $p < .001$, indicating suitable factorability of the correlation matrix (Field 2009).

A scree plot (Cattell, 1966) was interpreted to show either two or four optimum factors, but the pattern matrix clearly showed a four-factor solution. When deciding on factor retention, the factors should be interpreted in a theoretically meaningful way (Worthington & Whittaker, 2006). Based on Stevens' (2002) criteria, adequate loadings need to be .38 or above for a sample of 200, thus four items were deleted, alongside any cross-loading items that could not be justified, and two items that did not theoretically

fit onto their factor. The remaining items were discussed within the research team to arrive at a conceptually sound interpretation. A 27-item four-factor model resulted, which accounted for 63% of the score variance.

We named the first factor Social Victimisation, which comprised six items that measured types of bullying that are either perpetrated by a social group (e.g., excluded from group chat) or to harm social reputations (e.g., opinions belittled in class); higher scores indicated higher reports of victimisation on all factors. This factor accounted for 47.87% of the model variance. Social bullying is a highly relevant factor based on other bullying literature and the findings from the earlier study (Harrison et al., 2022).

The second factor, Physical Act/Trace Victimisation, comprised seven items that seemed to measure students' perpetration of physical acts against another or acts that left a physical trace. Of note, this factor contained a mixture of online and offline items; online items leave a physical trace of bullying on websites or direct messages, suggesting that cyberbullying may not be a separate factor, but a continuation of traditional bullying outside of traditional means (Wolke et al., 2016). The cyberbullying items did not group together as a separate factor. Within a UK university context, and with the items included in this questionnaire, cyberbullying does not appear to be a separate issue from traditional bullying. With all exploratory factor analyses, the data are interpreted for the most theoretically plausible explanation, and so it was acceptable to locate the cyber items within the other factors, interpreted for what they represented (e.g., online social exclusion or online harassment with messages), rather than how they were perpetrated (i.e., via technology). This factor accounted for 7.53% of the unique model variance and included items such as "possessions sabotaged" and "nasty social media posts". This factor could be a continuation of physical childhood bullying.

The third factor, Psychological Victimisation, encapsulated seven items that could represent manipulative or controlling behaviour aligning with relationship abuse rather than childhood bullying (e.g., coerced or received inappropriate sexual advances). The items suggest matured bullying tactics amongst Emerging Adults that cross over with psychological abuse. The cross over between relationship or domestic abuse and bullying was previously identified by Basile et al. (2009) who found that they shared individual and social characteristics. Relationship abuse is usually committed in secret (i.e., within the home) and involves one other individual whom the abuser controls. Although this factor shares similarities with factor one, Social Victimisation, the items within this category tend towards a sexual, controlling, and gaslighting nature, with negative psychological consequences due to insidious and covert abuse. It differs from factor two, Physical Act/Trace Victimisation, even though some of the items are physical in nature; for example, stealing food or having possessions stolen results in no trace; that is, the items have vanished without evidence. However, the vanishment of items can leave a psychological trace in the form of fear, as victims have no proof someone has taken their possessions, resulting in confusion and anxiety. The model accounted for 4.31% of unique variance.

The fourth factor, Direct Verbal Victimisation, comprised seven items that measured targeted verbal harassment. These were the clearest items to label and are commonplace across all bullying literature (Casper, 2021), where victims are spoken to or shouted at negatively (e.g., called names to face or insulted about appearance). The model accounted for 2.80% of unique variance. The second, third, and fourth factors seemed to account for small variance percentages in the model, however, these smaller figures represent unique variance, and the shared variance that is greater is not included in this percentage figure. This indicates that there may be a crossover with the factors, as expected, as bullying types often correlate (Boulton, 2012). We felt the retained

items were still important as their loadings were above the recommended threshold, and they made theoretical sense to retain in their factors.

The total 27-item scale had an internal consistency of α = .96, with equally high estimates for all four subscales. All factors correlated, supporting the use of oblique rotation. See Table 1 for coefficient alphas and loading range and supplementary table C for factor loadings. Twenty-one items from the original pool were removed due to poor- or cross-loading, therefore, the remaining 27 items were advanced to the next pilot study, which explored the factor structure with a new sample.

Table 1

Four-factor scale properties for Study One

Subscale factor	Cronbach's α	Loading range
Social Victimisation (6 items)	.86	.48 - .69
Physical Act/Trace Victimisation (7 items)	.93	.51 - .87
Psychological Victimisation (7 items)	.90	.42 - .72
Direct Verbal Victimisation (7 items)	.91	.44 - .93

Study 2: Replication and Further Exploratory Analysis

The purpose of Study 2 was to (1) attempt to conceptually replicate the factor structure from our Study 1 exploratory findings using the 27 retained items on another sample, (2) examine the factor structure of the scale using EFA in SPSS, (3) delete items that did not load sufficiently, and (4) evaluate the internal consistency of the scale items using Cronbach's alpha. One item was added, measuring exclusion from a desired social activity, as the second author thought it was an important omission based on their school bullying knowledge.

Method

Participants

Participants were 313 students from a variety of UK universities; 304 responses remained once incomplete and excluded (i.e., from non-UK university students) responses were deleted. NB: By incomplete, we mean participants who had not progressed very far beyond the demographic questions. This number met the criteria of recommended five-ten people per variable for pilot studies (Field & Hole, 2003). The sample comprised 186 females, 116 males, and 2 self-described as transgender. The mean age of participants was 25.23 years (SD = 7.33).

Procedure

Any current UK university student was eligible to take part. Due to time constraints at this point in the series of studies, participants were recruited via the paid survey site, Prolific. Those who were eligible had to check boxes to confirm they (a) were a university student, and (b) were currently residing in the UK. They completed the survey online via Qualtrics and were paid (£0.75) through Prolific on completion. The survey was live on Prolific for only one week, as the desired number of participants were collected during this time. The participants indicated their consent and proceeded to demographic questions. The same bullying definition was given, and the same questions were asked about victimisation and perpetration, with final open-ended questions about identity-related bullying or other bullying types.

Results

Again, few students reported perpetrating, therefore, only the victimisation scores were analysed. The items were again subject to an EFA with oblique rotation., There were only 28 individual cases of missing data, so the minimal missing data (missing cells accounted for 0.33% of the entire dataset) were imputed with participant means for non-missing observations that were not expected to inflate correlations. This was an attempt to preserve as much of the data as possible. The KMO was high at .94 and Bartlett's test of sphericity was significant, $p < .001$.

Three eigenvalues over one were extracted and the scree plot was unclear; it could be interpreted as a one, two, or three-factor model from the ambiguous points of inflexions. To investigate further, the analysis was run again with the request of a three-factor extraction. All coefficients were at the recommended .32 or above (Worthington & Whittaker, 2006) indicating suitability for the scale.

The first factor seemed to contain all the Psychological Victimisation and Physical Act/Trace Victimisation items with some cross-loadings (accounting for 51.03% of model variance). The second factor contained most of the Social Victimisation items (6.90% of the model variance) and the third factor most of the Direct Verbal items (3.83% of the model variance). When there was item ambiguity or inconsistency, the item was retained where it made theoretical sense. Loading ranges in their three-factor structure can be seen in Table 2; factor loadings can be seen in supplementary Table D.

Table 2 *Three-factor scale properties for Study Two*

Subscale factor	Cronbach's α	Loading range
Physical/Psychological Victimisation (14 items)	.94	.37 - .92
Social Victimisation (9 items)	.92	.42 - .80

Direct Verbal Victimisation (5 items)	.91	.48 - .63

To assure a thorough analysis after the ambiguous scree plot, a second two-factor extraction with oblique rotation was requested. There were some cross-loading items, but the consensus seemed to show a split where most Social Victimisation and Direct Verbal Victimisation items shared a factor (Factor 1, accounting for 51.16% of the variance), and most Physical Act/Trace and Psychological Victimisation items shared the other factor (Factor 2, accounting for 6.78% of the variance). See Table 3 for model characteristics (factor loadings can be seen in supplementary Table E). Consequently, Study 2 produced two possible competing models, a two-factor and a three-factor model. The factor results did not replicate Study 1; rather, we identified two additional plausible models that needed to be tested alongside the model identified from the first study.

Table 3

Two-factor scale properties for Study Two

Subscale factor	Cronbach's α	Loading range
Social/Verbal Victimisation (16 items)	.95	.40 - .93
Physical/Psychological Victimisation (12 items)	.93	.41 - .96

Study 3: Confirmatory Factor Analysis with three Competing Models

The purpose of Study 3 was to test the four-factor model from Study 1 and the two-factor and three-factor models from Study 2 as competing models in a Confirmatory Factor Analysis (CFA) using SPSS AMOS v24., with a new sample of students. Testing competing models is recommended to avoid modifying models for acceptable fit post-hoc (Jackson et al., 2009).

Method

Participants

Participants were 616 students from 91 UK universities; 441 responses remained once incomplete and excluded (i.e., from non-UK university students) responses were deleted. The sample comprised 353 females, 81 males, three self-described as other gender identities (two non-binary, one genderfluid) and three people preferred not to say. The mean age of participants was 23.40 years (SD = 6.00).

Procedure

A convenience sample of participants was recruited via social media, a mailing list (associated with the British Psychological Society), and an internal research

participation scheme within the University's School of Psychology. Data were collected through the host site, Qualtrics. Prolific was not used for Study 3, as this was a larger study with more time allocated for collecting responses, rather than being a pilot. A gift voucher prize draw was offered as an incentive. Participants completed consent questions, demographics, and then moved on to the full survey. Data were collected over five months until a large sample was gained. This third survey measured other student-related correlates, such as wellbeing and university belongingness, as well as student bullying. The data from the full survey is reported elsewhere (Harrison, in prep).

Results

Before the CFA models were run in AMOS using Maximum Likelihood, multiple imputation, as recommended with CFA, was used to fulfil missing values (.15% of dataset cells were missing) as suggested by Eekhout et al. (2014). Based on Byrne (2016), each of the three CFA models of the scale structure hypothesised a priori that (1) responses can be explained by the number of factors proposed; (2) each item has a non-zero loading on the factor it was designed to measure and zero loadings on the others; and (3) the error/uniqueness terms are uncorrelated.

Model 1

For Model 1 with the four factors of (1) Social Victimisation, (2) Physical Act/Trace Victimisation, (3) Psychological Victimisation, and (4) Direct Verbal Victimisation, the data fell slightly short of the recommended incremental and residual fit indices. It is recommended that the ratio of chi-square to degrees of freedom should be less than 3 (Kline, 1998), values of Comparative Fit Index (CFI) and Normed Fit Index (NFI) should be more than .90, and the Root Mean Square Error of Approximation (RMSEA) .08 or lower (Browne & Cudeck, 1993). Indices of fit were: χ^2 (344, N = 441) = 1268.11, NFI = .85, CFI = .89, RMSEA = .08; χ^2/df ratio = 3.69. Although the goodness of fit statistics are not ideal, some are very close to being considered satisfactory. All items loaded well onto the factors, with loadings ranging from .54 to .86. Based on the non-normal data, Bollen and Stine's (1992) non-parametric bootstrapping was conducted with normal Maximum Likelihood. The results indicated $p < .001$, suggesting that the model fit the sample better in all 2000 simulated samples compared to the real sample, indicating a poor fit of this sample to the model.

Model 2

For Model 2 with the three factors of (1) Psychological and Physical Victimisation, (2) Social Victimisation, and (3) Direct Verbal Victimisation, the model was an inadequate fit to the data. Indices were: χ^2 (347, N = 441) = 2074.24, NFI = .81, CFI = .83, RMSEA = .11; χ^2/df ratio = 5.98. All items loaded well onto the factors, with loadings ranging from .48 to .88. Bollen-Stine bootstrapping with 2000 samples found p <.001, indicating that the model fit the sample better in all 2000 of the simulated samples compared to the real sample, indicating poor fit.

Model 3

For Model 3 with two factors, (1) Social and Verbal Victimisation and (2) Psychological and Physical, the model again was a poor fit to the data. Indices of fit were: χ^2 (349, N = 441) = 2418.81, NFI = .77, CFI = .80, RMSEA = .12; χ^2/df ratio = 6.93. All items loaded well onto the factors, with loadings ranging from .48 to .86. Bollen-Stine Bootstrapping found p <.001, indicating that the model fit the sample better in all 2000 of the simulated samples compared to the real sample, suggesting poor fit.

In summary, Model 1, as identified in Study 1, was superior in fit to the data and broached the borderlines of the commonly accepted indices of fit. The fit indices used to determine the usefulness of factorial models tend to change over time and are not hard and fast cut-off points like usual significance testing (Hooper et al., 2008). From the range of fit indices presented, we show that Model 1 has the best indices of the three models, with the RMSEA on the arbitrary cut off point. The internal reliability for the factors was high at .89 for Social Victimisation, .90 for Physical Act/Trace Victimisation, .83 for Psychological Victimisation, and .92 for Direct Verbal Victimisation, and the items make theoretical sense within their four-factor structure, much like school bullying categories. However, the items within the factors show similarities and differences with school bullying. This model merits further consideration. See Table 4 for the final scale items in the Model 1 four-factor categories.

Table 4

Final scale items in their four-factor categories

Factor	Item
Social Victimisation	Purposely been ignored e.g., everyone stops talking to you (not online)
	Excluded from group chats or games online
	Had others turn against you on the will of another student
	Had your opinions belittled (e.g., in class)
	Been set up to fail
	Experienced negative clique-group behaviour
	Been excluded from a social activity you wanted to be included in
Physical Act/Trace Victimisation	Had possessions sabotaged e.g., books or essays torn up
	Had images of yourself shared or used for blackmail online
	Been misled/manipulated by people using fake accounts
	Been physically attacked seriously e.g., kicked, hit, had something thrown at you
	Been physically attacked e.g., pushed, tripped
	Been prevented from using facilities e.g., people deliberately not letting you use computers in the library/access being restricted to communal areas
	Had nasty things said about you on social network posts or blogs
Psychological Victimisation	Had your food thrown away or eaten on purpose
	Experienced inappropriate sexual advances
	Been stalked or followed on campus

	Been harassed online with a bombardment of messages
	Been coerced or pressured into doing something you didn't want to do
	Felt manipulated or controlled by someone
	Had possessions stolen
Direct Verbal Victimisation	Been the target of unfriendly/nasty jokes
	Been called nasty names to your face
	Been insulted about your appearance
	Been mocked in public or private (not online)
	Felt threatened or intimidated by someone (not online)
	Been shouted at
	Been made fun of in a nasty way

Discussion

The aim of this study was to create a new scale to measure bullying at university. A series of studies was conducted to develop and test the measure and to investigate its factor structure. The first study produced a logical four-factor model, with some factor labels mapping onto the childhood bullying literature (Social, Physical Act/Trace, Psychological, and Direct Verbal, Table 4). Social and Psychological bullying were separate groups, and it was noteworthy that the cyber victimisation items did not belong to a single factor but separated into other categories. This provides support for Wolke et al. (2017), who argued that cyberbullying is simply a new tool for bullying others who are already bullied using traditional means.

The Social Victimisation sub-scale is unsurprising given that this is a common feature of school bullying; it becomes more common and more sophisticated as children progress through school, and it seems, does not stop when children leave school (Lund, 2017). Indeed, acts of social victimisation including social exclusion have been reported in the workplace bullying literature (e.g. O'Reilly & Banki, 2018). The social items all involved being attacked or humiliated in a social setting with witnesses, and this category strongly relates to the 'power and social groups' theme apparent in our qualitative study (Harrison et al., 2022) - where bullying is used to increase one's own social status and lower others'.

The Physical Act/Trace items are linked to actions that occur within abusive romantic relationships reflecting the different development periods for school bullying and bullying at university. Bullying at university is likely to include more sophisticated, and perhaps harmful psychologically abusive behaviours. Along with the psychological items, the Physical Act/Trace items resonate with the power and control aspect of the bullying definition. There was some crossover with the items on the psychological and physical factors, as clearly some of the psychological factors are physical acts; however, the overarching theme within this cluster of items was that of "mind games", a comment that came from the physical focus group (Harrison et al., 2022).

The category of verbal victimisation was expected; these items represented direct derogatory comments at another, either alone or with witnesses. Doğruer and Yaratan (2014) found that verbal bullying, alongside emotional bullying, was the most common type in the Higher Education context within Turkey, and it seems that this finding translates well to the UK. Verbal bullying, or incivility, is recognised as a common tactic in workplace bullying (e.g. Holm et al., 2015).

For the first analysis of the second study, a three-factor model was produced; two matched the first study (Social and Direct Verbal), but the Physical Act/Trace and Psychological items merged onto one factor. Some of the items within these categories are ambiguous and could possibly fit into both categories depending on the interpretation. As mentioned, items in the psychological category could be categorised as being physical acts perpetrated for a psychological gain.

The second analysis of the second study produced a two-factor model. The Social and Direct Verbal items merged into one category, and the Psychological and Physical items into another category. One interpretation of the two-factor model could be that the first factor contains group behaviours, and could be mistaken for banter, be insidious, and leave no traces. These behaviours are also commonly seen in school bullying. The second factor contains all the behaviours that could be classed as mature and criminal and are less commonly seen in school bullying. Thus, the factor structure, although different to that identified for Study 1, is still plausible.

The third study tested the three models using a CFA and found that none of the three models reached the recommended fit indices levels as outlined in the results section, but Model One with four factors was the best fit out of the three, suggesting it was the most valid model at representing the variables measured. Two categories out of the four matched onto common school bullying types, with the other two showcasing important differences between childhood and higher education student bullying. These categories support the earlier work by Sinkkonen et al. (2014), as our categories shared some features, such that our 'Social' category could map onto their 'Indirect Public', and we both found a Direct Verbal category. All items had sufficiently high loadings and high internal reliability, suggesting the items represented bullying behaviours in HE, though their optimum structure needs investigating further to illuminate item groupings and theoretical relationships. We actively encourage researchers to build on these findings to establish an adequate factorial model that fits the data.

Strengths and Limitations

It is noted that sampling may have caused issues for the studies and explained some of the conflicting findings. Firstly, using a non-probability voluntary sample could have led to skew (Furr & Bacharach, 2008); perhaps only those who had never been affected by bullying decided to participate (based on the low victimisation scores). Students most affected by bullying, either because they were currently experiencing it or because past bullying had impacted their current wellbeing, might have avoided engaging with the studies. Alternative suitable sampling methods may be needed in future to ensure broader experiences are captured through surveys.

The different findings for the study might reflect the different recruitment methods with the use of the on-demand and online service, Prolific, with Study 2. It is important to recognise that concerns have been raised about the validity of data collected using these online services (e.g., Gadiraju et al., 2015). Future research using this scale could compare the equivalency of different methods of recruitment. It is possible that for some topics, such as bullying, those who sign up to take part and get paid for their participation do not reflect the general population of university students well.

Furthermore, the scale may have gathered an incomplete picture of the bullying behaviours in Higher Education, and this could explain the variation across studies and why the factor structure did not present neatly. During the three studies, an open-ended question asked if there were any other methods of bullying that the survey did not ask

about, which led to a list of additional behaviours that could be turned into items in the future. These were not added part-way through the iterative process, as the students in the previous round would not have had the opportunity to answer regarding the new items. Examples of these additional behaviours include 'boys' club cliques', 'cold shouldering', 'taking advantage of someone's kind nature', 'deliberately withholding information from others in their group', and 'neglected boundaries'. Researchers can use these data to inform future developments of the scale (see supplementary material for full list of open-ended responses).

The original intention was to develop a questionnaire to measure victimisation *and* perpetration, but the data collected on perpetration provided minimal variance (i.e., few people admitted to participating in the behaviours outlined in the bullying items). These behaviours do happen at university, based on data from the earlier qualitative study and the data collected from the three studies reported here. We collected responses from students reporting being bullied; therefore, some students must be perpetrators even though few admit it. This questionnaire appears not to be an appropriate measure for perpetration, as students are reluctant to admit to bullying. This may be due to the importance of reputation, which has previously been noted as vital for students (Harrison et al., 2022). Additionally, perpetrators may read the definition of bullying at the start of the questionnaire, which may transcend their existing frame of reference for bullying (possibly carried over from school) and deny perpetrating. This could be for self-preservation or disbelief that certain behaviour could be classed as bullying. Lastly, it could be that the sample contained few perpetrators, perhaps because the majority of bullying in Higher Education may be perpetrated by a relatively small number of students; this merits further investigation. As this was a convenience sample, students who took part may have been interested in the topic, and conversely, the topic may have deterred perpetrators. Future research should investigate perpetrator perspectives.

Nevertheless, this is the first study to design a Higher Education bullying scale based on a multi-phase top-down approach, which explored the data before specifying a factor structure to be tested using CFA. Alongside consulting the literature to create items, students were also asked for their opinions on bullying and the types that they have seen or been involved in (Harrison et al., 2022). Consequently, items were not simply taken from the school bullying literature and used verbatim for the Higher Education context; rather, school bullying items were consulted, and some were adapted for this context. Previously unknown methods of bullying were identified from the earlier study, such as accommodation-related actions and control-based behaviour, and diverse items were used to capture a range of Higher Education bullying experiences. Alongside the methodological contributions reported here, the study confirms the existence of bullying in Higher Education, and that bullying methods both share characteristics with school bullying and can take different forms. The further development of our proposed scale will support further research into the nature of bullying in Higher Education.

Recommendations

Further research and development of our proposed scale is needed in order to generate firm recommendations. This paper has brought together literature on the measurement of bullying in other educational contexts, with some examples of attempts to measure bullying in HE. It provides an account of our approach to develop this new tool. We

offer two tentative recommendations to colleagues concerned about bullying in higher education.

Higher education institutions are, rightly, concerned about student mental health and wellbeing, and many have created anti-bullying policies and support systems as one way to address this (Harrison et al., 2020). This study has confirmed that bullying is a very real issue within higher education, which is known to impact upon student mental health and wellbeing. However, it seems likely that the evidence that informs such policies and support mechanisms is largely drawn from school contexts, and a better understanding of bullying in higher education is necessary. We encourage those responsible for anti-bullying initiatives within universities to consider the literature and preliminary findings presented here when updating policies or designing interventions, and to recognise that bullying in higher education has not yet been clearly defined. New and updated policies should recognise this and allow some flexibility in bullying reporting processes.

For those teaching and supporting students in higher education, it should be noted that bullying at university takes more diverse forms and is more nuanced than in school contexts; it can be disguised and minimised, and different students may experience it differently. Those on the receiving end might not immediately recognise it as bullying behaviour. All reports of bullying must be taken seriously and investigated appropriately, even when those reports do not conform to staff's expectations of what constitutes bullying based on their experiences and knowledge from other contexts.

Conclusion

We describe the creation of a new measure of Higher Education bullying. Considering the current media coverage of increased mental health problems, lowered wellbeing, and harassment amongst university students, a suitable scale was needed to objectively assess the extent of Higher Education bullying. Bullying and harassment may contribute to levels of distress within this population. Developing a new scale is a complex process that often requires several rounds of testing before being considered reliable and valid; these findings show some progress towards a new Higher Education student bullying scale. Although none of the models fit the data ideally, this scale provides a good starting point for further development to provide an accurate representation of Higher Education student bullying for future studies.

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