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Developing the cyber victimisation experiences and cyber bullying behaviours scales

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Abstract

The reported prevalence rates of cyber victimisation experiences and cyber bullying behaviours vary. Part of this variation is likely due to the diverse definitions and operationalisations of the constructs adopted in previous research and the lack of psychometrically robust measures. Through two studies, the current research developed (Study 1) and evaluated (Study 2) the cyber victimisation experiences and cyber bullying behaviours scales. In Study 1 393 (122 male, 171 female), and in Study 2 345 (153 male and 192 female), 11- to 15-year-olds completed measures of cyber victimisation experiences, cyber bullying behaviours, face-to-face victimisation experiences, face-to-face bullying behaviours, and social desirability. The three factor cyber victimisation experiences scale comprised: threat, shared images, and personal attack. The three factor cyber bullying behaviours scale comprised: sharing images, gossip, and personal attack. Both scales demonstrated acceptable internal consistency and convergent validity.

Key words: cyber victimisation, cyber bullying, face-to-face victimisation, face-to-face bullying, social desirability, scale development

Developing the cyber victimisation experiences and cyber bullying behaviours scales

Since the 1970's, and the pioneering work of Olweus (1978), numerous studies have examined young people's experiences of face-to-face victimisation and bullying behaviours. Together these studies have reported both short-term and long-term consequences of experiencing various forms of face-to-face victimisation and engaging in bullying behaviours for psychosocial adjustment and health (Allison, Roeger, & Reinfeld-Krikman, 2009; Espelage & Swearer, 2003; Gibb & Abela, 2008; Jackson & Cohen, 2012; Lund et al., 2009; Nansel et al., 2001; Singh & Bussey, 2011). A wealth of research has examined the various forms of bullying. Direct and indirect forms of bullying can be further categorized into verbal, social, physical, and relational bullying (Hawker & Boulton, 2000). However, with the so called "digital revolution" new forms of technology are increasingly being used to bully others. For example, over the last eight years the prevalence of cyber bullying has doubled (Patchin, & Hinduja, 2015). Those most likely to be involved in cyber victimisation (CV) and cyber bullying (CB) are adolescents (Ševčíková & Šmahel, 2009) with involvement in cyber bullying peaking around the age of 14 (Ortega et al., 2012). Therefore, the current study developed psychometrically sound measures of CV and CB in 11- to 15-year-olds from the UK.

In the last decade internet use has evolved from one of stationary connections, on shared desktop computers, to constant connections via a multitude of portable technologies. It is estimated that 99% of all 12- to 24- year-olds in the UK are now internet users with young people spending increasing amounts of time using technology (Office for National Statistics, 2013). The increasing use of technology and unprecedented levels of connectivity (Aricak, Suyahhan, Tanrikulu, & Kinay, 2013) has yielded advantages for educational attainment (Jackson, 2011) and social support (Valkenburg & Peter, 2007), but claimed that these benefits are often offset by more adverse experiences (Cross, Monks, Campbell, Spears,

& Slee, 2011). For example, the risk of experiencing CV is one readily identified by parents, teachers, and practitioners (Cassidy, Faucher, & Jackson, 2013). Moreover, the propensity to experience CV and engage in CB is likely to increase as a function of the amount of time a young person spends online (Berson, Berson, & Ferron, 2002): Those who spend the greatest amount of time online are thought to be at the greatest risk. According to the time displacement hypothesis spending time online detracts from other face-to-face socialisation opportunities and consequently has the unintended consequences of limiting cognitive and social skill development opportunities (Epsinosa & Clemente, 2013).

CV and CB have ascended to the forefront of the public agenda following concerns that involvement in CV and CB are associated with a number of negative outcomes. These associations include: distress (Li, 2010), loneliness (Jackson & Cohen, 2012), depression (Tynes, Rose, & Williams, 2010), a greater incidence of psychosomatic symptoms (Sourander et al., 2010), antisocial behaviour and substance abuse (Mitchell, Finkelhor, & Wolak, 2007), and suicidal ideation (Sinclair et al., 2012). The reported prevalence rates of CV and CB vary. For example, the Third American Youth Internet Safety [telephone] Survey of 1,500 10- to 17- year-olds, suggested that the incidence rate of CV may be as low as 6.5% (Jones, Mitchell, & Finkelhor, 2012). Conversely, an anonymous web based survey conducted by Juvonen and Gross (2008) found that 72% of the 1454 American 12- to 17- year-olds asked reported experiencing CV at least once in their life. In contrast, the majority of studies have suggested that approximately 20 to 40% of young people are currently experiencing CV or have experienced CV in the past (Aricak et al., 2008; Dehue, Bolman, & Völlink, 2008; Hinduja & Patchin, 2008). These variations in prevalence rates may reflect differences in young people's CV and CB; however, they may also be indicative of methodological differences in how the constructs are assessed. Specifically, modifying the

time frame that young people are asked to report over may yield different results such that prevalence may increase as the time frame increase.

Defining and assessing CV and CB

There is little consensus about how to define and conceptualise CV and CB (Kowalski, Giumetti, Schroeder, & Lattanner, 2014). Kowalski et al. make the distinction between those conceptualisations of CV and CB that are specific relating to a particular form of technology and those that are general focusing on behaviour that occurs via the internet or mobile telephone. The first definitions of CV and CB relied heavily on definitions of face-to-face victimisation experiences and bullying behaviours and some authors argue that CB behaviours are akin to face-to-face-bullying behaviours such as insults, rumours, and threats delivered through an electronic media (e.g., Calvete, Orue, Estévez, Villardón, & Padilla, 2010). Olweus (1993) argued that an act is considered to be bullying when there is intentional harm to a target, repetition of harmful behaviours, and a power imbalance between the target and the perpetrator(s). However, although parallels exist between face-to-face and cyber experiences (Wang, Iannotti, & Luk, 2012), there are a number of distinctions between these (Betts & Houston, 2012). For instance, the perpetrator of the act is unlikely to be aware of the target's reaction when using technology (Smith, 2012) which may, in turn, blunt the perpetrator's empathic response and, as such, serve to perpetuate the behaviour (Agatston, Kowalski, & Limber, 2011; Davis & Nixon, 2011). Further, whilst face-to-face bullying behaviours involve repetition, one off acts of cyber bullying behaviour can be viewed by a potentially unlimited number of people on numerous occasions, due to the nature of the communications. This repeated viewing is akin to the target being repeatedly attacked (Dooley, Pyzalski, & Cross, 2009; Grigg, 2010; Menesini, 2012; Nocentini et al., 2010; Smith, 2012).

The nature of the power imbalance in CV and CB has been similarly debated (Grigg, 2010; Menesini, 2012; Nocentini et al., 2010; Smith, 2012). Specifically, Fauman (2008) suggested that the ability to remain anonymous when engaging in CB creates a different power dynamic and reduces the need for perpetrators to be physically stronger than their targets. However, the anonymity of the perpetrator may serve to amplify the fear and negative effects of the cyber bullying behaviours on the target (Aoyama, Saxon, & Fearon, 2011).

In addition to the ambiguity surrounding the conceptualisation and definition of CV and CB, the acts can take many forms (Kowalski, Limber, & Agatston, 2008; Smith, 2009). For example, sending hurtful or threatening messages to the target, posting comments about the target in publically accessible areas online (Finkelhor, Mitchell, & Wolak, 2000); hacking someone's account or impersonating someone else and then sending damaging messages to the target (Breguet, 2007); taking unflattering photographs or videos of the target and posting them online (Diamanduros, Downs, & Jenkins, 2008; Slonje & Smith, 2008); and sexting, or circulating sexually suggestive messages, photographs, or videos about another person online (Spears, Slee, Owens, & Johnson, 2009). These diverse acts have been reported to have different impacts on the target with pictures and/or video clips perceived as having greater impact on the target than name calling, insults, or threats (Slonje & Smith, 2008). Failing to assess the range of acts that constitute CV and CB is likely to influence the conclusions that can be drawn with regard to the effect on psychosocial adjustment (Arick, Siyahhan, Tanrikulu, & Kinay, 2013). Therefore, the present study addressed this issue by developing scales that assessed a range of behaviours.

Self-report measures of CV and CB

Self-report scales of CV and CB ensure that young people's subjective experiences are assessed (Espinoza & Juvonen, 2013). However, despite a number of measures of CV and

CB currently existing (see Kowalski et al., 2014 for a review), many of the psychometric properties of the scales remain unclear (Berne et al., 2013). Consequently, if the reliability and validity of the scales lack clarity, the robustness of the data may be questioned. Berne et al. suggested that perhaps the exception to this is the online victimisation scale for adolescents (Tynes et al., 2010). Similarly, Çetin, Yaman, and Peker (2011) developed the scale of cyber victim and bullying with the aim of identifying adolescents who experienced CV and engaged in CB which has reported psychometric properties. The three factor scales: cyber verbal bullying, hiding identity, and cyber forgery demonstrated good internal consistency, criterion validity, and split-half and test-retest validity. However, the scales developed by Tynes et al. and Çetin et al. only considered activity on the internet and ignored other technologies and mediums. Consequently, these scales may be limited because they do not fully capture the range of media used by young people (Beale & Jall, 2007). The cyber bullying questionnaire (Calvete et al., 2010) goes some way to address this issue by examining experiences across various modalities. However, given the ever changing digital technology, it is important to acknowledge that some technology can be used for multiple purposes and as such it may be more appropriate to ask adolescents about their general experiences when using electronic forms of contact rather than specific media (Rivers, 2013).

The CV and CB scales

The current CV and CB scales were designed to assess general experiences and involvement in cyber bullying rather than focusing on specific media for two reasons. First such an approach overcame challenges associated with changes in media use that reflect popular culture such as the transition from MySpace to Facebook by Australian teenagers during the 2000s (Robards, 2012). Second, assessing general experiences addressed the issue that new forms of CV and CB are likely to evolve with the changes to technology (Slonje, Smith, & Frisé, 2013). Items were generated to reflect young people's experiences of CV

and CB based on previous research (Betts & Spenser, in press) rather than providing them with a researcher generated definition of CV and CB. Also, the items pertained to all media rather than specific types to ensure that young people's experiences were accurately captured. Finally, young people had previously reported that the impact of CV varied according to whether they knew the identity of the perpetrator or whether the perpetrator was anonymous (Betts & Spenser, in press); therefore, items were created to make this distinction. Together, these steps ensured that the CV and CB scales accurately assessed young people's experiences.

One of the challenges associated with assessing young people's CV and CB, using self-report measures, is the propensity for participants to respond in socially desirable ways (Underwood & Card, 2013). Moreover, some adolescents may engage in socially desirable behaviour because they believe that it is regarded favourably by their peers (Hennessy, Swords, & Heary, 2008; Juvonen, 1991). Therefore, the current studies will assess social desirability and examine whether young people respond to the CV and CB scales in a socially desirable way.

CV, CB, and face-to-face victimisation and bullying

Whilst CV represents a unique experience compared to face-to-face victimisation (Varjas, Henrich, & Meyers, 2009), previous research has reported an association between adolescents' CV, CB, face-to-face victimisation experiences, and face-to-face bullying behaviours. For example, adolescents who report experiencing face-to-face victimisation were more likely to engage in CB (Accordino & Accordino, 2011). One possible explanation for this relationship is that, because of the anonymity afforded the perpetrator of CB, targets of face-to-face victimisation use CB as a means to retaliate (Vandebosch & van Cleemput, 2009). However, Erdur-Baker (2009) reported that 26% of those who engage in CB also reported engaging in face-to-face bullying behaviours. Adolescents who also experienced

victimisation by small text messages were also more likely to experience face-to-face victimisation (Marsh, McGee, Nada-Raja, & Williams, 2010) and 32% of those who reported experiencing CV also reported experiencing face-to-face victimisation (Erdur-Baker, 2009). Therefore, face-to-face victimisation experiences and face-to-face bullying behaviours were used to assess the convergent validity of the CV and CB scales developed in the current study. CV have also been associated with CB (Erdur-Baker, 2009); therefore, it was expected in the current study that CV would be associated with CB.

Overview of the present research

There were two aims of the current research. The first aim was to develop a measure of CV and CB with young people aged 11- to 15-years-old that reflected their experiences of CV and CB, and then examine the factor structure and psychometric properties of the scales (Study 1). The second aim was to confirm the factor structure and psychometric properties of the CV and CB scales developed in Study 1 in a different sample of young people (Study 2).

Study 1

The aim of Study 1 was to develop, through the use of exploratory factor analyses, the CV and CB scales. To assess the convergent validity of the newly developed scales the relationships with face-to-face victimisation experiences and bullying behaviours were examined. To examine the extent to which young people responded in a socially desirable way, the association between the CV and cyber CB scales and social desirability were also examined.

Method

Participants. Participants included 393 (222 male 171 female) 11- to 15-year-olds (mean age = 12.81, SD = 1.32) recruited from a school in the East Midlands in the UK that had a catchment area that served a range of socio-economic backgrounds and the majority of the sample was white. Four other schools had been approached to participate in the study but

the head teachers declined to participate. All of the schools approached to take part in the research were from a geographically similar area. Participants reported spending on average 145.35 minutes a day ($SD = 197.33$) using a mobile telephone, 42.77 minutes a day ($SD = 80.47$) using a computer, and 82.22 minutes a day ($SD = 135.15$) using a lap top.

Measures.

Cyber victimisation experiences. Fifty two items were developed based on: (1) an extensive review of the existing measures of CV and the literature and (2) results from focus groups conducted with young people on their experiences of CV and CB (Betts & Spenser, in press). Specifically, items were created that reflected a range of CV experiences that young people said that they encountered when using technology (e.g., sharing of images, threats, rumours, blaming them for something, sharing personal information, and disruption to social networks). Participants responded to the items using a six point scale ranging from 1 (*Never*) to 6 (*Everyday*) the extent to which they had experienced the behaviour described in the item over the last three months. Items were summed such that high scores indicated greater CV.

Cyber bullying behaviours. Fifty eight items reflecting CB behaviours were created. Where possible parallel items were created based on those for CV experiences although for the CB behaviours it was possible to ask participants a wider range of questions relating to anonymity and pretending to be someone else while cyber bullying others than it was for CV. For these items participants responded using a six point scale ranging from 1 (*Never*) to 6 (*Everyday*) to report the extent to which they had engaged in these behaviours over the last three months. Items were summed such that high scores indicated greater CB.

Face-to-face victimisation experiences and bullying behaviours. The 16-item multidimensional peer-victimisation scale (Mynard & Joseph, 2000) was administered twice to participants to assess victimisation experiences and bullying behaviours. Participants were first asked to report their experiences of peer victimisation over the last year using a three-

point scale: 1 (*Not at all*), 2 (*Once*), and 3 (*More than once*) and then report the extent to which they had engaged in the behaviours described in the items over the last year using the same three-point scale similar to the procedure used by Betts, Houston, and Steer (2015). Victimization experiences and bullying behaviours were assessed across four different domains: Physical (e.g., “punched me/another person”), social manipulation (e.g., “Tried to get me/another person into trouble with my/their friends”), verbal victimisation (e.g., “called me/another person names”), and attacks on property (e.g., “Took something of mine/another person’s without [their] permission”). Items were summed and high scores indicated higher victimisation experiences and bullying behaviours. Given the number of items in each of the subscales, there was acceptable internal consistency $\alpha = \geq .62$ and $\leq .86$ which are consistent with previous reports (Mynard & Joseph, 2000) and reflect the small number of items in each subscale.

Social desirability. The 12-item Crandall Social Desirability Scale for Children Form A (Carifio, 1994) was used to assess self-reported propensity to engage in socially desirable behaviour using a *True* (1) / *False* (2) format (e.g., “When I make a mistake, I always admit that I am wrong”). Items were coded and summed such that high scores indicated a greater propensity to engage in socially desirable behaviour and the scale had acceptable internal consistency $\alpha = .68$.

Procedure. The newly developed CV and CB items were reviewed by an expert in the area of cyber psychology to ensure the items were appropriately worded, addressed the desired construct, and demonstrated content validity. In particular, the items were reviewed to ensure that they captured previous experiences of CV and CB in young people including those described in previous research (e.g., Betts & Spenser, in press). Changes were made to 10 CV and 8 CB items to remove ambiguities in the wording.

Prior to completing the CV and CB items, participants were told that they should respond to the items with regard to electronic forms of contact. Following Rivers' (2013) recommendations, electronic forms of contact was defined to "include all types of technology that may be used to communicate with others". This definition ensures that participants' experiences of internet enabled devices such as smart phones and tablets were captured in the questionnaire. Participants completed the questionnaires individually during class time and were told that participation was voluntary, that there were no right or wrong answers, and that they could withdraw from the study at any time. The materials for the current study were administered as part of a broader project which took participants 30 minutes to complete.

Consent for the research was given by the head teacher at the school. Parents were informed of the nature of the study by letter and communications from the schools. Having received the information about the study, parents were asked to respond if they did not want their son/daughter to take part in the study. All parents agreed that their son/daughter could participate in the research. Testing took place over a number of days to ensure that all eligible participants had the opportunity to complete the measures should they wish. The young people were also asked to give their assent before completing the questionnaires: All of the young people approached to participate in the study did so and consented to participate.

Data analyses. Item analyses were first undertaken to ensure that the appropriateness of the items for both scales. To ensure the items generated a range of responses the facility indices were calculated. Items with a facility index > 1.10 and < 5.8 were retained for subsequent analyses based on Rust and Golombok's (1999) recommendations. A value outside of these parameters would indicate that all of the participants provided the same answer for the question. Next the item-total correlations were examined and where the correlation $< .20$, the item was removed (Rust & Golombok, 1999).

Exploratory factor analyses using principal axis factoring as the extraction method were conducted separately for the: (a) CV items and (b) CB items to examine the factor structure. The exploratory factor analyses were followed by promax rotations as it was anticipated that the factors would be associated. Items were removed in sequence from the factor analyses if there were less than three items loading on a factor or if the item loaded equally on more than one factor until all factors/items met these criteria (Fabrigar, Wegener, MacCallum, & Strahan, 1999). The factor analyses were repeated until these criteria were satisfied. Once the CV and CB scale structure had been identified through factor analyses, the internal consistency of the subscales was calculated and correlations were used to examine the associations between the measures.

Results

Item analyses. Thirty four of the CV items, and 27 of the CB items had a facility index > 1.10 and < 5.8 indicating that these items generated a range of responses from participants (Rust & Golombok, 1999) and, as such, were included in the subsequent analyses. The remaining CV and CB items failed to generate a range of responses meaning that participants responded to the items in the same way. Typically, the items that failed to generate a range of responses were ones that most participants reported that they had not engaged in or experienced the event (e.g., “Sent someone a virus”). One CV experience item was also removed because the item-total correlations was $< .20$.

Factor analyses. The initial factor solution for the CV scale contained 7 items that loaded on factors with less than 3 items and 11 items that loaded equally on more than 1 factor. The final solution accounted for 65.57% of the variance (see Table 1 for item loadings). Based on the item loadings, the factors were labelled as threats, sharing images, and personal attack. The factors were correlated and the strongest association was between

treats and personal attack, $r = .58$. There was also an association between threats and sharing images, $r = .39$, and between sharing images and personal attack, $r = .47$.

Insert Table 1 about here

The initial factor solution for the CB scale contained 5 items that loaded on factors with less than 3 items and 10 items that loaded equally on 3 factors. The final solution accounted for 63.26% of the variance (see Table 2 for item loadings). Based on the items loadings, the factors were labelled as sharing images, gossip, and personal attack. The three subscales were correlated with each other. The strongest association was between sharing images and personal attack $r = .50$, gossip and personal attack, $r = .47$, and the weakest association was between sharing images and gossip, $r = .36$. All of the extracted factors had eigenvalues > 1 .

Insert Table 2 about here

The internal consistency for all of the subscales was good (See Table 1 and 2).

Associations with face-to-face victimisation experiences, face-to-face bullying behaviours, and social desirability. Convergent validity of the CV and CB scales was examined through the association between the subscale scores, face-to-face victimisation experiences, and face-to-face bullying behaviours (Table 3 and Table 4). There were modest positive associations between the various subscales of the CV scale indicating that those participants who had experienced one form of CV had experienced the other forms. Similarly, there were small to modest positive associations between the various subscales of CB scale indicating that those who had engaged in one form of CB had engaged in the other forms. Small to modest positive associations also occurred between the various CV subscales and the CB subscales indicating that those who reported experiencing CV also reported engaging in CB.

Small to modest positive associations emerged between all of the CV, CB, face-to-face victimisation experiences, and face-to-face bullying behaviours subscales with the exception of attacks on property face-to-face bullying behaviours. The modest associations suggest that participants who experienced higher levels of CV also experienced higher levels of face-to-face victimisation and that participants who engaged in higher levels of CB also engaged in higher levels of face-to-face bullying behaviours. Together these associations provide evidence of the convergent validity of the newly developed measures of CV and CB.

The association between CV, CB, and social desirability was also examined (Table 4). Small negative associations also emerged between social desirability, CV, and CB: Lower reported social desirability was associated with greater reported CV and CB.

Insert Table 3 and Table 4 about here

Study 2

The aim of Study 2 was to further examine the psychometric properties of the newly developed CV and CB scales. A second cohort of 11- to 15-year-olds were recruited to complete the CV and CB items to examine whether the factor structure identified in Study 1 could be replicated through confirmatory factor analyses. As with Study 1, the convergent validity of the CV and CB were examined through the relationship with face-to-face victimisation experiences, face-to-face bullying behaviours, and social desirability.

Method

Participants. Three hundred and forty five (153 male 192 female) 11- to 15-year-olds (mean age = 12.12, SD = .98) participated in the research. An additional, four schools were invited to participate in the Study 2, one school agreed to be involved. Therefore,

participants were recruited from a different school in the East Midlands in the UK than in Study 1. The school had a catchment area that served a range of socio-economic backgrounds and the majority of the sample was white. Participants reported spending on average 199.39 minutes a day ($SD = 297.60$) using a mobile telephone, 36.29 minutes a day ($SD = 112.87$) using a computer, and 80.07 minutes a day ($SD = 112.87$) using a lap top. Compared to the participants in Study 1, participants in Study 2 reported spending significantly more time using mobile telephones, $t(746) = 2.95, p = .003$. There was no significant difference between time spent using a computer, $t(745) = 1.12, p > .05$, and a lap top, $t(745) = .23, p > .05$, between the two samples.

Measures.

Cyber victimisation experiences. The 15 items identified in Study 1 were administered to assess the extent to which participants had experienced CV over the last 3 months. Participants responded to the items using a six point scale ranging from 1 (*Never*) to 6 (*Everyday*).

Cyber bullying behaviours. The 12 items identified in Study 1 were administered to assess the extent to which participants engaged in CB over the last 3 months. For these items participants responded using a six point scale ranging from 1 (*Never*) to 6 (*Everyday*).

Peer victimisation experiences and bullying behaviours. As in Study 1, the 16-item multidimensional peer-victimisation scale (Mynard & Joseph, 2000) was administered twice to assess face-to-face victimisation experiences and bullying behaviours over the last year using a three-point scale: 1 (*Not at all*), 2 (*Once*), and 3 (*More than once*). Given the number of items in each of the subscales, there was acceptable internal consistency $\alpha = \geq .60$ and $\leq .88$.

Social desirability. The 12-item Crandall Social Desirability Scale for Children Form A (Carifio, 1994) was again used to assess self-reported propensity to engage in socially

desirable behaviour using a *True* (1) / *False* (2) format. The scale had acceptable internal consistency $\alpha = .73$.

Procedure. The same procedure used in Study 1 was used implemented in Study 2.

Data analyses. First, separate confirmatory factor analyses were performed to examine the three factor models of the CV scale and the CB scale, identified in Study 1, using Mplus (Muthén & Muthén, 1998-2007). Next, the internal consistency of the subscales of the CV and CB scales and the associations between measures were examined.

Results

Confirmatory factor analyses. The three factor models for both scales met many of the requirements needed for a good fit (see Table 5): The Root Mean Square Error of Approximation was an acceptable indication of fit and the Comparative Fit Index and the Tucker-Lewis Index were close to, or exceeded, the acceptable value of .90 (Bryant & Yarnold, 1995). Although the chi-square was significant for both models, which may suggest some limitations in the fit of the data, such a result is common when sample sizes are greater than 200 (Schumacker & Lomax, 1996). The items exceeded the recommended loading of .60 with the exception of one item from the CV scale and one item from the CB scale (see Figures 1 and 2, Netemeyer, Bearden, & Sharma, 2003). The internal consistency assessed as cronbach's alpha for all of the subscales was good, $\alpha \geq .83$ and $\leq .90$.

Insert Table 5 about here

Associations with face-to-face victimisation experiences, face-to-face bullying behaviours, and social desirability. The convergent validity of the CV and CB scales was again examined through the association between the subscale scores, face-to-face victimisation experiences, face-to-face bullying behaviours, and social desirability using

partial correlations (Table 3 and Table 4). As with Study 1, modest positive associations existed between the various subscales of the CV scale and the CB scale indicating that those participants who had experienced one form of CV or who engaged in one form of CB had experienced the other forms or had engaged in the other forms of behaviours. Small to modest positive associations also occurred between the various CV subscales and the CB subscales indicating that those who reported experiencing CV also reported engaging in CB.

As with Study 1, small to modest positive associations emerged between CV, CB, face-to-face victimisation experiences, and face-to-face bullying behaviours with the exception of the CB gossip subscale and the social face-to-face victimisation experiences. Together, these associations suggest that participants who experienced higher levels of CV also experienced higher levels of face-to-face victimisation and that participants who engaged in higher levels of CB also engaged in higher levels face-to-face bullying behaviours providing further evidence of the convergent validity of the newly developed scales. Small negative associations also emerged between social desirability, CV, and CB. With the exception of the CB gossip subscale, lower reported social desirability was associated with greater reported CV and CB.

Discussion

The goal of the current study was to develop (Study 1) and validate (Study 2) a measure of CV and CB with young people aged 11- to 15-years-old in the UK. A clear three factor model emerged (Study 1) and was replicated (Study 2) for the CV and CB scales. Both scales demonstrated acceptable internal consistency and small to modest convergent validity which is comparable with previous CV and CB scales (e.g., Cetin et al., 2011). There was also evidence that participants responded to the CV and CB scales in a socially desirable way.

The CV and CB scales

The CV scale comprised three factors labelled: threat, shared images, and personal attack. The CB scale comprised three factors labelled: sharing images, gossip, and personal attack. The threat and personal attack subscales are consistent with Mark and Ratliffe's (2011) conceptualisation of CV which included threats and personal attacks such as disclosing an individual's private information. One of the reasons why personal attack and shared/sharing images are likely to be forms of CV and CB is because of young people's propensity to upload images and disclose personal information on social networking sites (Sengupta & Chaudhuri, 2011). Moreover, previous research has argued that engaging in risky behaviour online such as disclosing personal information such as passwords and usernames are predictive of CV and CB (Erdur-Baker, 2010). Disclosing more personal information online may, therefore, give potential perpetrators of CB ammunition to attack their target with.

Gossip was identified as a subscale of the CB scale and this is consistent with previous research that has identified gossip as a form of CB (Vandebosch & van Cleemput, 2009). Whilst gossip can be a tool to maintain social ties within children's friendship networks (McDonald, Putallaz, Grimes, Kupersmidt, & Coie, 2007), when an individual is the subject of gossip it can lead to them experiencing distress as to how others perceive their situation (Foster, 2004). Further, if the communicator of the gossip has a close relationship with the target then the consequences of the gossip are likely to be exacerbated (Foster, 2004). One explanation for this is that gossip can also be used as a mechanism to damage the reputation of others (McAndrew, Bell, & Garcia, 2007) and, as such, this may account for why it was identified as CB in the current study. The identification of the factor of gossip is also consistent with the argument that CB is akin to relational and social forms of face-to-face bullying (Mark & Ratliffe, 2011) and that CB can take the form of rumour spreading which is a common facet of relational bullying (Wang et al., 2012).

The items within the CV and the CB scales were not identical. This suggests that some adolescents report experiencing different behaviours than they report engaging in. There are a number of possible explanations for this finding. First, the difference may occur because of the social desirability associated with reporting CV and CB. Specifically, although self-report methods enable subjective experiences to be assessed (Espinoza & Juvonen, 2013), young people often under report the true extent of their CV and CB because of a desire to portray themselves in a positive manner and because of the fear that their access to digital technology will be reduced (Underwood & Card, 2013). This fear may be particularly pertinent for those that engage in CB. Second, whilst there was an association between CV and CB, the lack of overlap between scale items may be because of how individuals interpret actions. Specifically, it may be that some of the acts encountered online may not be interpreted as CV and certain behaviours may not be intended as CB. For example, when discussing behaviours in the digital world, adolescents make the distinction between cyber bullying behaviours and banter (Betts & Spenser, in press). Banter is an “interactional bonding game” (p. 246) that is interpreted as playful by interaction partners rather than having sinister undertones (Dyrel, 2008). Therefore, targets and perpetrators may modify how they view a particular behaviour such that they do not regard it as CV and CB to avoid the potential consequences associated with both of these (Holfeld & Leadbeater, 2015). However, it is important to acknowledge that behaviours intended by the perpetrator to be banter may be interpreted by the target as CV and, as such, be associated with negative outcomes.

The reported mobile telephone use of the samples in Study 1 and Study 2 were significantly different suggesting that the young people in both samples differed in some aspects of their engagement with technology. The fact that the factor structure was replicated despite the differences in technology use suggests that the scales can be applied to diverse samples with regard to their engagement with technology.

Associations between CV, CB, and face-to-face bullying

The convergent validity of the CV and CB scales was established through the small to modest associations with face-to-face victimisation experiences and face-to-face bullying behaviours. These relationships are consistent with previous research studies that have reported similar associations (e.g., Accordino & Accordino, 2011; Erdur-Baker, 2009; Marsh et al., 2010). The small to modest strength of the associations are also consistent with Varjas et al.'s (2009) proposition that CV represents a distinct experience from face-to-face victimisation. Although, it remains unclear from the current data whether those who experienced face-to-face victimisation turn to digital technology as a means to retaliate and, as such, engage in cyber bullying behaviours (Vandebosch & van Cleemput, 2009), there is some evidence of the co-occurrence of involvement in bullying. For example, targets of face-to-face relational bullying subsequently become perpetrators of cyber bullying (e.g., Connell, Schell-Busey, Pearce, & Negro 2014). To fully explore this hypothesis longitudinal research with more than three time points should be conducted to examine the direction of causality and trajectories between face-to-face victimisation experiences and CB.

Limitations

Whilst both scales accounted for a large proportion of variance, the scale did not ask respondents to consider the balance of power with regard to their CV and CB. Previous research has argued that compared to face-to-face victimisation experiences, the balance of power in CV is difficult to establish and possibly context dependent (Nocentini et al., 2010). However, Walker, Craven, and Tokunaga (2013) argued that without establishing the power dynamics in CV unintentional acts may be confounded with intentional acts. Therefore, future research should explore the power dynamics using the newly developed scales to examine whether the prevalence rates of CV and CB vary according to the attributed power and intent.

The results also reveal that young people responded to the CV and CB scales in a socially desirable way, although it should be noted that the associations between these measures was small. However, this pattern of responses is not unexpected because research indicates that young people often under-report CV and CB because they fear that their access to technology will be removed (Mishna, Saini, & Solomon, 2009). Future research should also aim to replicate the findings of the current studies with young people from a wider and more diverse range of schools as school climate can impact on young people's experiences of bullying (Gendron, Williams, & Guerra, 2011).

The items for the CV and CB scales were developed following previous research with young people Betts and Spenser (in press) that explored their conceptualisation of CV and CB which highlighted the importance of anonymity. However, whilst young people may struggle to identify whether they know the identity of the perpetrator in CV, young people have previously highlighted that their experiences of CV were different according to whether or not the perpetrator was known to them (Betts & Spenser, in press). Although the item for the CV scale pertaining to obscene images did not load on the imagery subscale, it is appropriate to acknowledge that it would be expected to load on the imagery subscale and should be explored in future research.

Implications

The scales developed in the current study have implications for future research, given that the factor structure was replicated and the evidence of convergent validity, the scales could be used in future studies to assess CV and CB. Further, the scales were developed to apply to all forms of contact via electronic devices so that they may still be applicable as new forms of CB evolve with the changes in technology (Slonje et al., 2013). Additionally, the scales were developed to assess experiences and behaviours across the range of media that young people use to overcome some of the limitations of previous scales (see Beale & Jall,

2007) and when used in conjunction with measures of psychosocial adjustment, the newly developed scales should allow a broader investigation in to the consequences of CV and CB as Arick et al. (2013) advocated.

Conclusions

In summary, the CV and the CB scales demonstrated many of required psychometric properties. There was also evidence of an association between adolescents' face-to-face victimisation experiences, face-to-face bullying behaviours, and the newly developed scales.

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Table 1

The pattern matrix from the exploratory factor analysis and the Cronbach's alpha for the CV scales in Study 1

Items	Factor			Communalities		M	SD
	1	2	3	Initial	Extraction		
Threats							
Sent me a(n)...							
...threatening comment anonymously	.84			.71	.72	1.14	.60
...threatening comment whilst pretending to be someone else	.80			.60	.60	1.09	.45
...threatening comment and it was from someone I don't know	.79			.58	.58	1.17	.65
...obscene image and it was from someone I know	.74			.59	.55	1.14	.55
...threatening comment and it was from a friend after an argument	.71			.57	.53	1.13	.49
...threatening comment and it was from someone I know	.59			.57	.51	1.21	.67
Sharing images							
Taken a photograph of me doing something humiliating and shared it without permission		.89		.70	.77	1.19	.55
Taken a photograph of me doing something embarrassing and shared it without permission		.79		.60	.61	1.33	.70
Made a video of me doing something embarrassing and shared it without permission		.79		.55	.61	1.23	.63
Made a video of me doing something humiliating and shared it without permission		.66		.57	.47	1.11	.42
Shared my photographs without my permission		.63		.45	.43	1.41	.82
Personal attack							
Called me an offensive nickname			.95	.82	.91	1.82	1.22
Referred to me by an offensive nickname			.90	.81	.80	1.63	1.12
Made fun of me because of appearance			.72	.62	.65	1.65	1.15
Blamed me for something I couldn't help			.55	.48	.44	1.59	1.03
Cronbach's alpha	.91	.88	.85				

Note: Extraction method is principal axis factor and rotation method is promax. Rotation converged in 5 iterations

Table 2

The pattern matrix from the exploratory factor analysis and the Cronbach's alphas for the CB scale in Study 1

Items	Factor			Communalities		<i>M</i>	<i>SD</i>
	1	2	3	Initial	Extraction		
Sharing images							
Made a video of someone doing something humiliating and shared it without permission	.87			.61	.73	1.13	.50
Made a video of someone doing something embarrassing and shared it without permission	.77			.53	.56	1.23	.59
Taken a photograph of someone doing something humiliating and shared it without permission	.74			.54	.59	1.17	.51
Taken a photograph of someone doing something embarrassing and shared it without permission	.74			.54	.56	1.35	.73
Gossip							
Forwarded a post with a rumour about someone		.86		.52	.65	1.11	.40
Forwarded a post with gossip about someone		.70		.40	.43	1.13	.45
Posted gossip about someone		.59		.44	.45	1.27	.61
Posted a rumour about someone		.56		.41	.42	1.12	.37
Forwarded a post with a joke about someone		.52		.40	.35	1.27	.66
Personal attack							
Called someone an offensive nickname			.99	.65	.93	1.51	.93
Referred to someone by an offensive nickname			.71	.57	.59	1.39	.77
Made fun of someone because of their appearance			.64	.377	.38	1.26	.61
Cronbach's alpha	.86	.79	.81				

Note: Extraction method is principal axis factor and rotation method is promax. Rotation converged in 5 iterations

Table 3

Associations between the CV and CB scales in Study 1 above the diagonal and in Study 2 below the diagonal

	CV			CB		
	1	2	3	4	5	6
CV						
1. Threats		.55***	.79***	.32***	.26***	.37***
2. Sharing images	.60***		.78***	.42***	.24***	.39***
3. Personal attack	.67***	.67***		.35***	.35***	.42***
CB						
4. Sharing images	.54***	.66***	.45***		.33***	.42***
5. Gossip	.45***	.45***	.35***	.65***		.43***
6. Personal attack	.60***	.47***	.50***	.62***	.49***	

Note. Values above the diagonal pertain to Study 1 (df = 378) and values below the diagonal pertain to Study 2 (df = 319) *** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$

Table 4

Associations between CV, CB, peer victimisation experiences, peer bullying behaviours, and social desirability scales in Study 1 and Study 2

	Study 1						Study 2					
	CV			CB			CV			CB behaviours		
	Threats	Sharing images	Personal attack	Sharing images	Gossip	Personal attack	Threats	Sharing images	Personal attack	Sharing images	Gossip	Personal attack
Peer victimisation experiences												
Physical	.21***	.23***	.21***	.14**	.16***	.15**	.29***	.27***	.38***	.13*	.20***	.25***
Social	.35***	.49***	.51***	.29***	.23***	.25***	.36***	.36***	.59***	.19**	.11	.26***
Verbal	.35***	.49***	.55***	.31***	.22**	.30***	.42***	.36***	.62***	.21***	.17**	.36***
Property	.36***	.41***	.37***	.25***	.26***	.22***	.36***	.34***	.48***	.22***	.17**	.22***
Peer bullying behaviours												
Physical	.15**	.19***	.23***	.18**	.21***	.30***	.56***	.40***	.40***	.48***	.49***	.54***
Social	.12*	.20***	.28***	.28***	.27***	.32***	.62***	.61***	.53***	.53***	.41***	.49***
Verbal	.15**	.23***	.29***	.29***	.29***	.38***	.64***	.48***	.47***	.54***	.43***	.67***
Property	.03	.05	.08	.15*	.10*	.28***	.61***	.49***	.44***	.49***	.44***	.48***
Social	-.14*	-.17**	-.20***	-.31***	-.21***	-.31***	-.20*	-.24**	-.21*	-.27**	-.14	-.30***
desirability												

Note. df Study 1 = 356, Study 2 df = ≥ 161 and ≤ 305 *** $p \leq .001$, ** $p \leq .01$ * $p \leq .05$

Table 5

Tests of model fit in Study 2

Model	df	χ^2	RMSEA	CI RMSEA	CFI	TLI
CV	87	182.68***	.056	.045 - .068	.92	.91
CB	51	115.68***	.061	.046 - .075	.91	.88

Note. RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, and TFI = Tucker-Lewis Index. *** $p < .001$.

Figure 1. Standardised item loadings for the CV scale Study 2

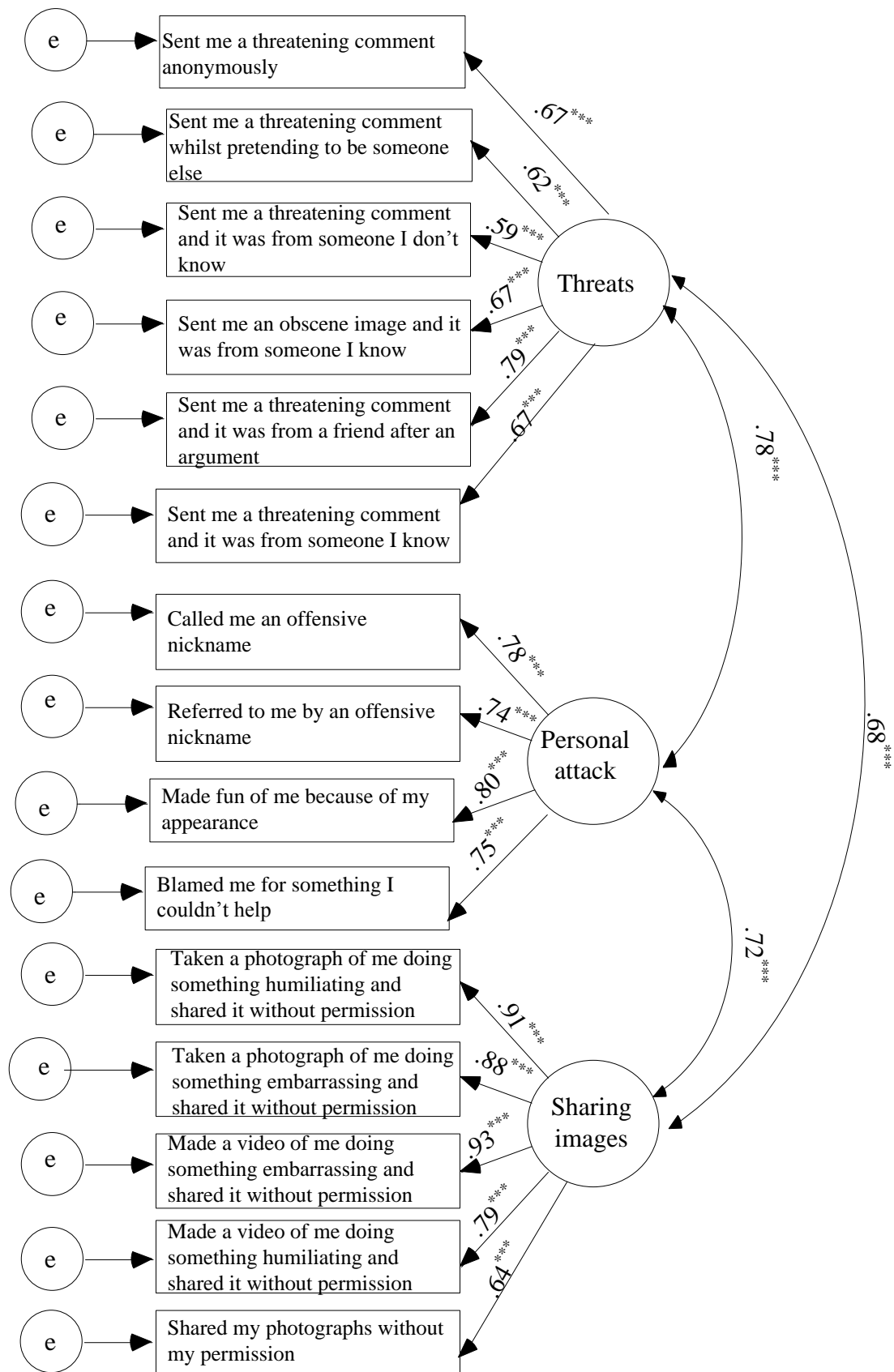


Figure 2. Standardised item loadings for CB scale Study 2

