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## **The mitigating role of ecological health assets in adolescent cyberbullying victimisation**

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## **Abstract**

Over the last decade cyberbullying has emerged as a public health concern among young people. Cyberbullying refers to intentional harmful behaviours and communication carried out repeatedly using electronic media. Considerable research has demonstrated the detrimental and long-lasting effects of cyberbullying involvement. This paper draws on a social-ecological perspective to identify protective health assets from across the multiple environmental domains of the adolescent that may mitigate against experiencing cyberbullying. Data were collected from 5335 students aged 11, 13 and 15 years who participated in the 2014 World Health Organization Health Behaviour in School-aged Children Study for England. Protective health assets were identified at the family (family communication), school (school sense of belonging and teacher support) and neighbourhood (neighbourhood sense of belonging) levels. In particular the findings draw attention to the protective role fathers can play in supporting young people.

## **Keywords:**

Aggressive behaviour/bullying, neighbourhood context, victimization, parent support

## **Introduction**

Bullying is widely acknowledged as a public health concern, with cross-national analysis identifying that one in three young people were victimised in the past two months (Chester et al., 2015). While variation in definitions exist, bullying is commonly defined as an individual or group of individuals intentionally inflicting harm, repeatedly and over time, against someone who is unable to defend themselves (Olweus, 1993). Bullying behaviours can be physical, verbal, relational or cyber in nature. Longitudinal studies have demonstrated the detrimental effects of bullying on both physical and psychological health, as well as social outcomes including school attainment (Kowalski & Limber, 2013; Zwierynska, Wolke, & Lereya, 2013). Moving from an individual behaviourist model, more recently the social-ecological model has provided a valuable framework for the study of traditional forms of bullying (physical, verbal and relational), acknowledging that bullying is a complex social phenomenon which is cultivated or inhibited by the environment (Espelage, 2014). However, less research has examined cyberbullying within the framework of the social-ecological model.

### *Cyberbullying*

The current generation of young people inhabit a virtual world which spans the domains of adolescent life. Moreover, the development of smart phones has increased accessibility to the internet for young people, allowing online activity to shift from being primarily home based to openly available in public spaces; every week nearly half of young people in the UK access the internet outside of the home (Livingstone, Mascheroni, Ólafsson, & Haddon, 2014).

With young people conducting a significant amount of their social interaction in virtual environments (Brooks, Magnusson, Klemmera, Spencer, & Morgan, 2011) it is unsurprising

that negative forms of interaction and communication are also being played out online.

Cyberbullying, the online aspect of bullying, can take many different forms including sending abusive or threatening messages, uploading embarrassing photographs, sharing personal information, or exclusion from online groups. With ongoing technological developments the nature of cyberbullying is likely to be in flux, constantly evolving and changing, including both the platforms and methods adopted.

To date, reports of cyberbullying prevalence have varied; a recent systematic review identified lows of 3% and highs of 72% for cyberbullying victimisation in the United States (Selkie, Fales, & Moreno, 2015). The variation can be attributed in part to differences in operationalising and defining cyberbullying (see Kowalski et al. 2014 for an extensive record of research definitions). The notion of intent to cause harm via electronic means is widely accepted, but the concepts of repetition and a power imbalance underpinning traditional forms of bullying have been queried in relation to the virtual world; for example, when a single post can be viewed multiple times, and additionally shared by other individuals, it is difficult to quantify repetition (Smith, 2012; Waasdorp & Bradshaw, 2015). Moreover, the concept of a power imbalance differs in a virtual world where physical or social strength is less apparent (Dooley, Pyzalski, & Cross, 2009; Smith, 2012). The varying reference periods e.g. lifetime, past 12 months or past month also contribute to the ambiguity of cyberbullying prevalence rates (Kowalski, Giumetti, Schroeder, & Lattanner, 2014), along with differing measurement approaches e.g. behavioural check lists versus cyberbullying definitions (Modecki, Minchin, Harbaugh, Guerra, & Runions, 2014). While it is difficult to ascertain the true extent of cyberbullying, a recent cross-national study found 21.4% of 14-17 year old respondents had been a victim of cyberbullying in the previous year (Tsitsika et al., 2015).

As with the more traditional forms of bullying, research has demonstrated the detrimental effect of cyberbullying on health and wellbeing. Studies to date have explored the emotional wellbeing implications, including depression (Bauman, Toomey, & Walker, 2013; Wang, Nansel, & Iannotti, 2011), anxiety (Juvonen & Gross, 2008; Rose & Tynes, 2015), loneliness (Olenik-Shemesh, Heiman, & Eden, 2012) and suicidal ideation (van Geel, Vedder, & Tanilon, 2014). Moreover, longitudinal studies have demonstrated the causal nature of these relationships (Gómez-Guadix, Orue, Smith, & Calvete, 2013; Rose & Tynes, 2015). The consequences also extend beyond victims; being a cyberbully is associated with lower quality of life, increased psychological difficulties and suicide attempts (Bauman et al., 2013; Fletcher et al., 2014).

Studies have begun examining whether cyberbullying is an extension of the more traditional forms of bullying or functionally different (Law, Shapka, Hymel, Olson, & Waterhouse, 2012), and this extends to the relative consequences of each form. While the true possibility to match bullying behaviours online and offline has been called into question (Bauman & Newman, 2013), two large scale studies both identified that victims of cyberbullying had increased odds of internalising and externalising symptoms compared with victims of traditional bullying alone (Schneider, O'Donnell, Stueve, & Coulter, 2012; Waasdorp & Bradshaw, 2015). It is important to acknowledge that there is considerable overlap between cyberbullying and traditional bullying. Victims of bullying are likely to be subjected to a number of different bullying behaviours: Schneider et al. (2012) found that 60% of young people that had been cyberbullied also experienced bullying of a traditional form. Overall those who experience both cyberbullying and traditional bullying appear to have the worst health outcomes when compared with young people who experience only either cyber or traditional bullying (Schneider et al., 2012), indicating that cyberbullying has a unique effect on top of the impact of just traditional bullying (Bonanno & Hymel, 2013).

It has been speculated that the experience of cyberbullying may be more traumatic and result in greater harm due to contextual differences between the two forms of bullying, most notably issues relating to time and place. Unlike traditional bullying behaviours which tend to occur primarily in the school environment, cyberbullying can be experienced in any context where the victim is accessing electronic media (Patchin & Hinduja, 2006; Slonje & Smith, 2008). With over 80% of young people aged 12-15 years in the UK possessing a mobile phone (Ofcom, 2013) exposure to virtual communication and social interactions is ever-present and largely unavoidable. Cyberbullying has also been distinguished from more traditional forms of bullying due to the breadth of the audience, as the bystanders of cyberbullying often outnumber those of traditional bullying (Kowalski et al., 2014). It is thought the effects of cyberbullying may be heightened due to the anonymity of the bully; not only may the victim feel helpless not knowing the perpetrator, but the sense of anonymity can create a disinhibition effect among the perpetrator resulting in increased hostility and reduced empathy (Aboujaoude, Savage, Starcevic, & Salame, 2015). Removing online material can be difficult and can result in the victim being exposed to cyberbullying repeatedly, this permanent nature is a distinctive and unique feature of virtual interaction, where instances are recorded and stored online (van Geel et al., 2014).

### *Social-ecological framework*

A number of scholars have advocated the use of the social-ecological theory for advancing current understanding of school bullying (Espelage, 2014; Swearer & Hymel, 2015). A social-ecological perspective situates the development of young people in their social context, acknowledging the bi-directional interaction between an individual and the multiple domains in which they inhabit (Swearer & Hymel, 2015). The traditional ecological model of development proposed by Bronfenbrenner (1977) contains five elements: the individual, the micro-, meso-, exo- and macro systems. The individual is placed at the centre of the model,

interacting with and shaped by the different ecological systems as opposed to just individual character traits. The microsystem describes the immediate setting with which the individual has direct contact including school and family. The mesosystem describes interactions between elements of microsystem such as school and parents; the exosystem is an extension of the mesosystem which contain interactions in which the individual is not an active participant. The overarching level, macrosystem, describes the broader societal context including culture, economy and politics.

The social-ecological framework is not unique to young people, but refers to human development in the broader sense. However, Bronfenbrenner (1994) acknowledges the importance of the environment during early development in particular. The ecological systems are likely to evolve and shift throughout the life course; research highlights the following domains as particularly relevant to the development of young people.

***Family.*** The family is a fundamental microsystem in which young people's primary development and socialisation is fostered. Research has demonstrated family structure and dynamics within the family, particularly parent-child communication, as important influences on young people's health and wellbeing (Moreno et al., 2009) and engagement with risk behaviours (Bell, Forthun, & Sun, 2015; Brooks, Magnusson, Spencer, & Morgan, 2012).

***Friends.*** Traditional perspectives assume friends become of greater relevance during adolescence while the influence of the family diminishes. Subsequent theories, for example the continuity/cognitive model, describe the complementary role friends play in a young people's lives (Cooper & Cooper, 1992). Friendships have been established as particularly salient for adolescent identity development (Heaven, 1994).

***School.*** With young people spending a substantial amount of time at school, the school environment is an integral part of young people's lives. Young people acquire knowledge and

life skills at school which will impact upon later life chances in adulthood, and also encourage identity development and socialisation (Eccles & Roeser, 2011). Furthermore, student's perception of the school environment, including feelings of belonging and teacher connectedness, have been associated with young people's health and wellbeing (Fenton, Brooks, Spencer, & Morgan, 2010; García-Moya, Suominen, & Moreno, 2014)

***Neighbourhood.*** The local community has received less research interest compared with other domains of young people's lives, however the neighbourhood has been identified as an important exosystem for young people's development (Morrow, 2001, 2003). Young people who feel included and a sense of belong in their local community are less likely to engage in risk behaviours (Brooks et al., 2012).

The social-ecological perspective offers a potentially useful framework for the exploration of bullying behaviours as bullying is constructed and enacted via a complex interplay between individuals and their immediate and distant ecologies (Hong & Espelage, 2012). Evidence demonstrates the influence of the environment on young people's behaviour, with bullying involvement as either perpetrator, victim or bystander varying across time, space and context (Swearer & Hymel, 2015). Perceiving bullying as a result of complex interactions between young people and the different environments allows for identification of elements which foster a vulnerability to either bullying victimisation or perpetration. Risk factors have been identified from across the ecologies, but most notably at the individual level including gender, poor health status and anti-social personality traits (Swearer & Hymel, 2015), and at the micro level including negative family interactions (Lee, 2011), peer influence (Hong & Espelage, 2012) and an unsupportive school environment (Barboza et al., 2009).

Furthermore, a number of studies have implicitly identified risk factors from different ecologies of the adolescent world without explicitly framing the research in social-ecological

theory, for example poor teacher support and class management have been associated with an increased risk of bullying (Azeredo, Rinaldi, de Moraes, Levy, & Menezes, 2015).

The social-ecological framework can also be used to identify assets that are protective against experiencing bullying. An assets model not only considers how protective health assets are located as internal to the individual but also how resources located around the young person and in their environment work to protect young people's health and well-being and enhance capacities and capabilities (Morgan & Ziglio, 2007). An assets model suggests that there is a fundamental dynamic interaction between ecological factors in the environment of the young person and internal positive attributes. The identification of assets which protect against bullying has seen less attention than the mapping of risk factors, however recent research has highlighted the protective role parents and the family environment can play in preventing bullying (Boel-Studt & Renner, 2013; Sapouna & Wolke, 2013).

The social-ecological theory has proven to be invaluable to the study of bullying and helped lead the development of interventions which extend across domains of the adolescent world (Barboza et al., 2009), yet little research has examined cyberbullying from this context. By its very nature cyberbullying has the potential to extend beyond a victims immediate peer group, with bystanders not confined to the same class, grade, school or country; emphasising the importance of considering the influence of the environmental domains of the adolescent. Furthermore, Cross et al. (2015) propose the social-ecological framework is broadened to acknowledge the online environment as an additional context which young people are interacting with and thus influenced by.

### *The present study*

In the last decade cyberbullying has become a burgeoning field of inquiry. Many papers have addressed prevalence rates and definitions, made comparisons between traditional and cyber

bullying as well as exploring the psychosocial outcomes associated with cyberbullying. Yet despite the wealth of papers there remain notable gaps in terms of understanding the factors that might operate protectively against being cyberbullied. Overall, relatively few studies have focused on identifying ways to address cyberbullying, highlighting the need for empirically driven interventions at the level of community, school and family (Aboujaoude et al., 2015). The present paper will examine cyberbullying utilising a social-ecological framework, seeking to identify assets from across ecological systems which help protect young people from experiencing cyberbullying. Through consideration of what factors may be protective or mitigate against being cyberbullied we can draw practical conclusions about cyberbullying prevention among young people.

The present paper draws on the English data from the World Health Organization (WHO) Health Behaviour in School-aged Children (HBSC). The HBSC study is a unique cross-sectional survey that asks young people about their social environment, providing a detailed picture of the context in which young people live (Brooks et al., 2015; Currie et al., 2012). The breadth of the HBSC study is appropriate for consideration of factors across the different levels of Bronfenbrenner's (1977) ecological model of development. Individual traits including gender, age and ethnicity will be considered. The scope of the HBSC data allows for careful consideration of the four microsystems surrounding adolescents previously proposed by Lee (2011): interaction with family, peer relationships, interaction with teachers and school climate. Additionally, the present paper will examine the lesser researched neighbourhood environment; fewer studies have examined the influence of the exosystem on bullying behaviours (Hong & Espelage, 2012). Previous analysis of HBSC data identified three asset domains integral to the health and well-being of young people: sense of belonging, autonomy and social support (Brooks et al., 2012). The present study will examine the

association between these asset domains and cyberbullying across the ecological systems with which young people engage.

While there are undoubtedly overlaps between cyberbullying and traditional forms of bullying, cyberbullying alone is the main focus of the analysis and findings presented here. Data suggests cyberbullying and traditional bullying may differ in relation to psychosocial outcomes (Wang et al., 2011), the social demographic picture of victims is unclear (Tokunaga, 2010), and the qualitative differences between the two types are widely acknowledged (Kowalski et al., 2014). Consequently it is feasible that protective assets may differ across the different types of bullying behaviours.

## **Methods**

### *Participants and procedure*

HBSC is an international WHO collaborative study that examines young people's health and wellbeing, health behaviours and their social context. The study collects information from school students aged 11-, 13- and 15 years through anonymous self-completed questionnaires administered during class time. HBSC is conducted every four years in over 40 countries and regions across Europe and North America, carried out by national research teams following an international protocol (Currie et al., 2014).

The present study utilised data collected from the 2014 HBSC survey carried out in England (Brooks et al., 2015). A random sample of all secondary schools in England (state and independent) stratified by region and school type was drawn to ensure representative participation. Sampling was done by replacement so that if one school declined to participate, a second matched school was contacted. In total 48 schools were recruited, resulting in 5335 students from 261 classes. The final sample was representative of regions and school type.

The response rate at the student level was 92%. Prior to participation, students and parents received information letters and an opt-out form if they did not wish to participate.

Questionnaires were administered by either a member of the research team or teachers, and students were asked to seal their completed questionnaire in an envelope to ensure confidentiality. The study gained ethics approval via the University of Hertfordshire Ethics Committee for Health and Human Sciences (HSK/SF/UH/00007).

### *Measures*

**Cyberbullying:** Cyberbullying was measured via two items which asked young people how often in the past two months (1)“someone sent mean instant messages, wall postings, emails and text messages, or created a website that made fun of me”, and (2)“someone took unflattering or inappropriate pictures of me without permission and posted them online”. Response options include “haven’t been bullied in that way”, “once or twice”, “2-3 times per month”, “once a week” or “several times a week”. From these two variables, a single binomial variable was created indicating whether or not respondents had ever been a victim of cyberbullying (i.e. had replied “once or twice” or more often to either question). A categorical measure of cyberbullying was adopted following recent discussion highlighting the difficulty of measuring cyberbullying severity (Smith, 2012; Waasdorp & Bradshaw, 2015); for example, an online post may be seen, shared (both publically and privately) and commented on multiple times. Other forms of bullying were not included in the model as these would serve to confound the effect of the variables below on the existence of cyberbullying. However, the proportions of young people experiencing both cyber- and traditional forms bullying is reported.

Variables relating to family, school, peer and neighbourhood assets were created from related survey items (see below). For those assets where items are being combined, Cronbach alpha coefficients are shown in Table 1 and in all cases are (practically) at or above the 0.7 rule of thumb. For those asset variables which are not created from established measurement instruments, it was not felt appropriate to use them as simple scales and they have thus been categorised into “Low”, “Medium” and “High” as detailed in Table 1.

**Family assets:** Family communication with mother (FCM) and father (FCF) were assessed by the question “how easy it is for you to talk about things that really bother you?” measured on a 4 point scale from “very easy” to “very difficult”. Responses were collapsed into “easy” vs “difficult”. Personal autonomy in relation to family (PAF) was measured by the question “How much say do you have when you and your parents are deciding how you should spend your free time outside school?” Responses were categorised into high, medium and low PAF (see Brooks et al. 2012 for full details). Family sense of belonging (FSB) was categorised into low, medium and high FSB (see Table 1 for details). The Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988) measured family social support (FSS); responses to the four items concerning were averaged to provide an overall score of FSS.

**School assets:** School sense of belonging (SSB) and teacher social support (TSS) were both measured via three items and respondents were categorised into low, medium and high (see Table 1 for details).

**Peer assets:** Peer social support (PSS) was measured with the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988); responses were averaged to provide an overall score of PSS (see Table 1 for details).

**Neighbourhood assets:** Neighbourhood sense of belonging (NSB) was categorised as low, medium and high based on seven items (see Table 1 for details).

*[Insert table 1]*

**Demographics:** Gender, age, ethnicity and social economic status, as measured by the Family Affluence Scale (FAS), were all included in the present analysis. FAS is based on a set of six questions concerning material conditions of the family home (Currie et al., 2014). Responses are summed to produce a score between 0 – 13, and categorised into low (0-6), medium (7-10) and high (11-13) family affluence.

### *Statistical methods*

Due to the hierarchical nature of the data, multilevel modelling was undertaken using the package MLwiN (version 2.34) via the R2MLwiN package (version 0.8-1) in R (version 3.2.1).

A single model was built using forward selection of main effects, enabling the demographic variables to act as controls for the school, family, neighbourhood and peer assets. Wald tests were used to judge significance. The 1% level of significance was used opposed to 5% so as to allow for the fact that multiple hypothesis tests were being conducted. The inclusion of random slopes and then interactions between main effects were then considered using the 0.1% level of significance so as to avoid the inclusion of spurious effects/interactions. At each stage, removal of terms from the model was considered.

## **Results**

893 of 4985 (17.9%) respondents reported being a victim of cyberbullying in the previous two months. Across all ages girls were more likely to report being a victim of cyberbullying, and for both boys and girls being a victim of cyberbullying increased with age (Table 2). Just over half (57.8%) of young people who had been cyberbullied also reported being bullied traditionally in the past two months.

*[Insert table 2]*

A total of eight variables were retained in the final model. No random slopes or interactions entered the model. Results are given in Table 3 as odds ratios (OR) with 95% confidence intervals (CI) and P-values. Due to the number of comparisons that are being conducted results are only discussed where statistical significance reaches the 1% level. Those comparisons with a p-value of less than .01 have been highlighted in bold. The main effects contained in the model were as follows.

#### *Gender*

Boys are estimated to have 44% of the odds of being a victim of cyberbullying experienced by girls.

#### *Age*

11 year olds are estimated to have approximately 68% of the odds of being a victim of cyberbullying experienced by 15 year olds.

#### *Personal autonomy in relation to family (PAF)*

Those with low PAF are estimated to have approximately 68% of the odds of being a victim of cyberbullying experienced by those with high PAF. We found insufficient evidence to claim that this effect varied with age.

### *Communication with father (FCF)*

Those rating FCF “easy” are estimated to have 66% of the odds of being a victim of cyberbullying experienced by those who rate their communication as “difficult”.

### *School sense of belonging (SSB)*

Those with high SSB have 32% and those with medium SSB have 42% of the odds of being a victim of cyberbullying experienced by those with low SSB.

### *Teacher social support (TSS)*

Those with high TSS have 42% and those with medium TSS have 59% of the odds of being a victim of cyberbullying experienced by those with low TSS. Those with high TSS have 71% of the odds of being a victim of cyberbullying experienced by those with medium TSS.

### *Neighbourhood sense of belonging (NSB)*

Those with high NSB are estimated to have 51% of the odds of being a victim of cyberbullying experienced by those with low NSB.

### *Family affluence (FAS)*

Those with low FAS have 54% and those with medium FAS have 72% of the odds of being a victim of cyberbullying experienced by those with high FAS.

*[Insert table 3]*

There was insufficient evidence to claim that schools or classes differ in the odds of pupils reporting being victims of cyberbullying (having taken into account the variables in the model). An initial model before the introduction of explanatory variables suggested that such clustering effects might exist but once these were included, the effects diminished.

## **Discussion**

The findings of this study identify a range of potential protective health assets that may operate in protecting young people against being cyberbullied, including assets from the multiple ecologies of the adolescent world, notably; family, school and neighbourhood. The present study adds to the limited theoretical discussions surrounding cyberbullying (Dooley et al., 2009); providing support for the extension of the social-ecological framework beyond traditional bullying behaviours to encompass cyberbullying. While the current study was unable to incorporate the online world as an additional ecology (Cross et al., 2015), it is unique in examining cyberbullying among multiple ecologies simultaneously. Furthermore, the present study goes beyond prior research which has used the social-ecological framework to identify risk factors for bullying, to identify assets and protective factors from across the ecologies of young people's lives.

Echoing earlier research (Boel-Studt & Renner, 2013; Fanti, Demetriou, & Hawa, 2012; Perren et al., 2012; Sapouna & Wolke, 2013; Wang, Iannotti, & Nansel, 2009), the findings from this study identify the family microsystem is integral to young people's cyberbullying involvement. Although there are a number of studies that have identified parental support (Perren et al., 2012) and parental communication, including interest and knowledge regarding young people's online activities (Cerna, Machackova, & Dedkova, 2015; Mesch, 2009), as protective against cyberbullying, there remains a paucity of studies focusing particularly on the father's role and contribution in the protection of young people from this form of bullying.

Recent evidence has highlighted the significance of a father's involvement in an adolescents' life, with a strong impact on young people's wellbeing, happiness, life satisfaction and self-

esteem (Allgood, Beckert, & Peterson, 2012; Cava, Buelga, & Musitu, 2014; Clair, 2012; Fenton et al., 2010; Jafari, Baharudin, & Archer, 2013). Our findings support the idea that family communication and support, particularly communication with the father, can work to protect against cyberbullying. Very few studies have considered the importance of communicating with a father for young people's well-being, especially in relation to bullying, and our paper adds weight to the significant contribution of a father figure to young people's well-being. Highlighting the importance of continued investigations that focus on parental communication, specifically including fathers, as a protective health asset. Traditional perspectives on adolescent development tend to emphasise a transition from the central influence of parents to peers as young people move from early to mid- adolescence; consideration of the role of the family via assets based analysis is challenging this position (Brooks et al., 2012; Fenton et al., 2010). The findings in this paper support the increasing challenge to rather simplistic notions of peer/parent displacement and further the understanding of the significant contribution of parenting during adolescence.

In line with other research (e.g. Wang et al., 2009) our findings suggest lower family affluence is associated with less cyberbullying; this may be partially due to the more limited availability and access to electronic devices among poorer families, which reduces the potential of young people to be exposed to bullying online. Prior research has identified lower social economic status as putting young people at risk of experiencing traditional forms of bullying (Elgar et al., 2013), so in essence the results relating to family affluence are likely to be preventative in nature rather than protective.

As with earlier investigations (Dehue, Bolman, Vollink, & Pouwelse, 2012; Perren et al., 2012) the findings from our paper suggest that parental supervision and control can be protective against cyberbullying: young people whose parents were involved in decision making about leisure time and thus had lower levels of personal autonomy (PAF), were less likely to become

a victim of cyberbullying than those who showed high PAF. Our paper highlights the important role parents can play in monitoring and addressing cyberbullying. But does this mean that low levels of autonomy can by itself be a protective asset against cyberbullying? This contradicts an earlier study which identified that having parents who are highly protective and allow limited independence increases the risk of becoming a victim of the more traditional forms of bullying because autonomy and assertion skills are underdeveloped (Lereya, Samara, & Wolke, 2013). It could be suggested that high levels of parental involvement in decision making may result in monitoring of electronic media use through which cyberbullying is conducted, but a similar means of control is not available for traditional forms of bullying. This needs further investigation, in particular examining whether the role of parental supervision differs across the virtual and real world.

While it is difficult to indicate conclusions from null results, it is worth noting assets from the peer microsystem were not retained in the final model. Wang et al. (2009) found numbers of friends was protective against traditional bullying but not cyberbullying, suggesting the physical separation from friends can diminish their protective impact. Moreover, victims of cyberbullying have reported that in most cases it was friends who were perpetrating the bullying (Waasdorp & Bradshaw, 2015). This suggests that peers are potentially less likely than others in the adolescent's microsystem to be operating as protective assets which ameliorate the impact of cyberbullying. Furthermore, it opposes the traditional assumption peers become more influential on the lives of young people, and supports recent empirical and theoretical work that has identified the family as continuing to play a pivotal role in adolescent life (UNICEF, 2010).

While traditional bullying is often confined to the school grounds and constricted by school hours, cyberbullying extends beyond the school environment (Sabella, Patchin, & Hinduja, 2013). Despite this, the present paper highlights the important role that feeling connected to school and having a sense of belonging in the school community can play in protecting young people against cyberbullying. School belonging has been found to be higher in schools where pupils feel safe and where the school has taken steps to create lower levels of bullying overall (Goldweber, Waasdorp, & Bradshaw, 2013), suggesting that schools which develop a positive supportive culture and ethos may also be providing a protective function against the perpetration of cyberbullying, even if the bullying behaviours occur online and outside of the school environment. Cross-national analysis exploring the association between school sense of belonging and bullying demonstrates the relationship as consistent across countries (Freeman et al., 2009).

Teachers have been shown to play an important role in adolescent health and wellbeing, and can potentially fulfil a compensatory role for lower family support (Brooks et al., 2012; Fenton et al., 2010; Garcia-Moya, Brooks, Morgan, & Moreno, 2014). The present findings emphasise the important role teachers can have in protecting young people from being victims of cyberbullying: with increasing levels of teacher support associated with lower chances of victimisation. Positive teacher social support has not only been linked to students reporting that they are experiencing bullying, but also seeking help for other peers who are being victimised (Eliot, Cornell, Gregory, & Fan, 2010); feasibly one of the underlying mechanisms for how teacher social support functions as protective. Moreover, poor teacher support has been identified as a significant predictor of the perpetration of cyberbullying (Wei, Williams, Chen, & Chang, 2010; Williams & Guerra, 2007).

Of interest, much research suggests that young people's perception of the school environment is influenced by demographic factors (O'Brennan & Furlong, 2010), with decreases in teacher support with age (Garcia-Moya et al., 2014) and variations by gender noted (Griffith, 2000). However the present analysis did not identify significant interactions with demographic variables which suggests the potential for these factors of being a protective health asset for boys and girls of all ages, stressing the relevance of the school microsystem for the health and wellbeing of young people.

The current study did not consider the location of bullying activity (e.g. whether it occurred at school or at home), and it is possible that the importance of teacher vs parental support is context specific. However, what differentiates cyberbullying from traditional forms of bullying is that context is changeable, fluid and potentially ever present. It is often difficult to ascertain whether a bullying episode was instigated inside or outside of school; and because of the enduring nature victimisation may move from the school setting, to home, and back again. This means that young people who have supportive networks across different life domains are likely to be most protected against the adverse effects of cyberbullying. As previously discussed, strong support in one domain (e.g. from teachers) may compensate for low support in another domain (Brooks et al., 2012; Fenton et al., 2010; Garcia-Moya et al., 2014).

The present paper was able to contribute to the currently limited discussion of ecologies beyond the microsystems, through examination of the neighbourhood. The current analysis supports previous research which identified the protective function of neighbourhood and community on the health and wellbeing of young people (Brooks et al., 2012; Morrow, 1999). Having a strong sense of neighbourhood belonging may be indicative of being part of a collective (as opposed to individualistic) community; something that has been found to correlate with lower incidence of bullying behaviour (Lee, 2011). Living in a supportive,

welcoming community may also therefore have an effect of reducing the incidence or drivers towards participating in and exposure to cyberbullying. Moreover, cyberbullying is associated with increased time spent online (Wade & Beran, 2011) and young people who spend disproportionately large amounts of time on social media and other electronic platforms, aside from being at increased risk of exposure to cyberbullying, may also feel less engaged in their communities.

Identifying individual traits of cyberbullying victims can aid the prevention and detection of cyberbullying by highlighting groups of potentially vulnerable young people. A review by Tokunga (2010) did not draw any definitive conclusions concerning gender differences in relation to cyberbullying. However, recent research has identified that girls are more likely than boys to experience cyberbullying (Livingstone et al., 2014; Olenik-Shemesh et al., 2012; Schneider, O'Donnell, Stueve, & Coulter, 2012; Tsitsika et al., 2015; Waasdorp & Bradshaw, 2015), with the present study offering additional support for girls being most at risk. This finding is in stark contrast to the current understanding of gender and traditional forms of bullying, where boys have consistently demonstrated a greater risk of being involved as either perpetrator or victim (Craig et al., 2009; Nansel et al., 2001). A higher prevalence of cyberbullying among girls may be explained in part by existing research which demonstrates girls are more likely than boys to use electronic forms of communication (Brooks et al., 2011; Lenhart, 2015). It has also been suggested that the anonymity of the internet enable people to act in ways that are outside of regular social norms, and one consequence of this may be to allow females to display more aggression than they otherwise would (Ybarra & Mitchell, 2004).

Young people of all ages can be cyberbullied, but age appears to be a significant individual trait with older adolescents more at risk of being victimised in this way. Other studies that have looked at age and cyberbullying have found a trend towards a 'peak' of bullying

perpetration that occurs roughly at age 13-15 depending on the study (Aboujaoude et al., 2015; Wade & Beran, 2011), and our findings appear to support this in an English population. There may be many reasons why the incidence of cyberbullying peaks at a later age than traditional bullying, but it has been hypothesized that different forms of bullying necessitates different levels of cognitive ability (Peeters, Cillessen, & Scholte, 2010). For example, Sutton and colleagues (1999) have argued that certain forms of bullying relies on sophisticated manipulation and are grounded in theory of mind, which would require a level of cognitive ability and social intelligence that may not develop until mid-adolescence. The need for a certain level of social intelligence in relational aggression has been further supported by Bjorkqvist and colleagues (1994; 2000). Thus, the ability to understand how to use social media and other online settings for cyberbullying may require a sophisticated level of development that is not yet evident in younger adolescents.

#### *Limitations and future research*

As is the nature of cross-sectional research, the results cannot imply causality; the multilevel analysis identified associations between assets from varying social environments and cyberbullying but the direction of these relationships cannot be concluded. For example a positive school environment may foster lower levels of cyberbullying, but equally it could be that lower levels of cyberbullying create a more positive perception of the school environment. The study of cyberbullying from an assets-based perspective is a novel approach, and the findings reported here provide an initial snapshot of protective ecological assets from different domains of the adolescent world. Future longitudinal research would be able to confirm the direction of causality among cyberbullying and the protective assets.

We acknowledge bullying response rates have been shown to vary across measurement approaches (Modecki et al., 2014). The breadth of the HBSC England survey prevented cyberbullying from being examined in detail, and we appreciate the behavioural checklist utilised in the present study may have omitted other cyberbullying behaviours. However text messages and social media have been identified as the most common forms of cyberbullying (Whittaker & Kowalski, 2015), both of which are addressed in the present study and thus increase confidence that the current measure is capturing the vast majority of cyberbullying experiences. Future research exploring protective assets would benefit from a more comprehensive measure of cyberbullying.

The current paper did not control for other forms of bullying, and as such a proportion of young people who were cyberbullied were also victimised in other ways. The purpose of the study was to identify factors associated with the existence of cyberbullying, and inclusion of other forms of bullying behaviours would likely confound the effect of these variables. However, it warrants further research to examine whether protective assets differ across types of bullying experiences.

## **Conclusion**

Online activity has become an integral aspect of young people's lives, and as such should be examined in its social context (Chapman & Buchanan, 2012). The social-ecological theory provides a useful framework for examining the interplay between environmental factors and adolescent cyberbullying. Moreover, it is important that empirical work seeks to examine what protective health assets worth for who and in what context. Utilising an assets-based approach to the study of cyberbullying highlights the importance and the protective nature of

young people feeling connected to and having a sense of belonging in any of the multiple environments of school, family and community.

Moving beyond a traditional risk perspective and utilising the social-ecological model to identify protective ecological health assets enables the development of interventions which span environments of the adolescent. The present paper emphasises the importance of engagement between the ecological systems, namely the school, family and neighbourhood, may be most effective in reducing cyberbullying. Older adolescents and girls were identified as experiencing higher levels of exposure to cyberbullying, indicating that potential value of targeted interventions. However it is important to note that no significant interactions with age or gender were retained in the model, suggesting the protective assets identified in the present paper provide a useful overall set of protective factors that are equally beneficial to both boys and girls of all ages.

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No conflicts of interest to declare.

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Table 1: Creation and categorisation of asset variables

<b>Asset</b>	<b>Items</b>	<b>Response options</b>	<b>Scoring</b>	<b>Cronbach's alpha</b>
Family sense of belonging (FSB)	“Watch TV/DVD/film together”; “Play computer games”; “Play sports together and exercise”; “Sit and talk about things together”	Every day (1) – Never (5)	Responses summed and categorised into low (4-8), medium (9-12) and high (13-20)	0.670
Family social support (FSS)	“My family really tries to help me”; “I get the emotional support I need from my family”; “I can talk about problems with my family”; “My family is willing to help me make decisions”	Very strongly disagree (1) – very strongly agree (7)	Average score is calculated	0.952
School sense of belonging (SSB)	“The students in my classes enjoy being together”; “I feel like I belong in this school”; “I feel safe in this school”	Strongly disagree (1) – Strongly agree (5)	Responses summed and categorised into low (3-6), medium (7-11) and high (12-15)	0.744
Teacher social support (TSS)	“I feel my teacher accepts me as I am”; “I feel that my teachers care about me as a person”; “I feel a lot of trust in my teachers”	Strongly disagree (1) – Strongly agree (5)	Responses summed and categorised into low (3-6), medium (7-11) and high (12-15)	0.871
Peer social support (PSS)	“My friends really try to help me”; “I can count on my friends when things go wrong”; “I have friends with whom I can share my joys and sorrows”; “I can talk about problems with my friends”	Very strongly disagree (1) – very strongly agree (7)	Average score is calculated	0.945
Neighbourhood sense of belonging (NSB)	“People say hello and often stop to talk in the street”; “It is safe for younger children to play outside”; “You can trust people around here”; “There are good places to spend your free time”; “I	Strongly disagree (1) – strongly agree (5)	Responses summed and categorised into low (7-14), medium (15-27) and high (28-35)	0.802

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could ask for a favour  
from neighbours”; “Most  
people here would try to  
take advantage of you\*”;  
“I feel safe in the area  
where I live”

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\* reverse coding

*Table 2: Prevalence of reported cyberbullying, by gender and age*

	N (%)			
	11 years old	13 years old	15 years old	Total
Boys	89 (9.1%)	88 (11.5%)	122 (15.7%)	299(11.9%)
Girls	153 (16.0%)	207 (27.4%)	234 (31.4%)	594 (24.2%)
Total	242 (12.5%)	295 (19.4%)	356 (23.4%)	893 (17.9%)

Table 3: Odds of being a victim of cyberbullying for different explanatory variables

Variable	Comparison	OR	95% CI	p-value
Gender	<b>Boys compared with girls</b>	<b>0.44</b>	<b>(0.37, 0.54)</b>	<b>P&lt;0.001</b>
Age	11 year olds compared with 13 year olds	0.74	(0.57, 0.95)	P=0.020
	<b>11 year olds compared with 15 year olds</b>	<b>0.68</b>	<b>(0.53, 0.89)</b>	<b>P=0.004</b>
	13 year olds compared with 15 year olds	0.93	(0.74, 1.16)	P=0.505
FAS	Low FAS compared with medium FAS	0.75	(0.57, 0.98)	P=0.035
	<b>Low FAS compared with high FAS</b>	<b>0.54</b>	<b>(0.40, 0.72)</b>	<b>P&lt;0.001</b>
	<b>Medium FAS compared with high FAS</b>	<b>0.72</b>	<b>(0.59, 0.88)</b>	<b>P=0.001</b>
PAF	Low PAF compared with medium PAF	0.73	(0.56, 0.96)	P=0.026
	<b>Low PAF compared with high PAF</b>	<b>0.68</b>	<b>(0.51, 0.89)</b>	<b>P=0.005</b>
	Medium PAF compared with high PAF	0.92	(0.76, 1.12)	P=0.399
FCF	<b>Easy FCF compared with difficult FCF</b>	<b>0.66</b>	<b>(0.54, 0.80)</b>	<b>P&lt;0.001</b>
SSB	High SSB compared with medium SSB	0.77	(0.63, 0.95)	P=0.013
	<b>High SSB compared with low SSB</b>	<b>0.32</b>	<b>(0.19, 0.55)</b>	<b>P&lt;0.001</b>
	<b>Medium SSB compared with low SSB</b>	<b>0.42</b>	<b>(0.25, 0.70)</b>	<b>P&lt;0.001</b>
TSS	<b>High TSS compared with medium TSS</b>	<b>0.71</b>	<b>(0.58, 0.88)</b>	<b>P=0.001</b>
	<b>High TSS compared with low TSS</b>	<b>0.42</b>	<b>(0.28, 0.63)</b>	<b>P&lt;0.001</b>
	<b>Medium TSS compared with low TSS</b>	<b>0.59</b>	<b>(0.40, 0.87)</b>	<b>P=0.008</b>

NSB	High NSB compared with medium NSB	0.81	(0.67, 0.99)	<i>P</i> =0.042
	<b>High NSB compared with low NSB</b>	<b>0.51</b>	<b>(0.31, 0.84)</b>	<b><i>P</i>=0.009</b>
	Medium NSB compared with low NSB	0.62	(0.38, 1.01)	<i>P</i> =0.054

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