

Epidemiological evidence relating to resilience and young people

A literature review

Michelle Tollit, Myfanwy McDonald, Rohan Borschmann, Kristina Bennett,
Max von Sabler, George Patton

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Dr Michelle Tollit, Dr Myfanwy McDonald, Dr Rohan Borschmann, Ms Kristina Bennett, Mr Max von Sabler, Professor George Patton.

Centre for Adolescent Health, The Royal Children's Hospital Melbourne and Murdoch Childrens Research Institute.

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Executive summary

Background

The growing recognition of the impact of adversity on children and young people has led to a greater focus upon resilience. One of VicHealth's three-year priorities – relating to their overall focus on improved mental wellbeing – is “building stronger approaches to resilience”, with a specific focus upon young Victorians (VicHealth, 2013).

Resilience can be broadly defined as the ability to achieve positive outcomes despite adverse events, circumstances, or risk factors. Resilience explains why some people cope better than others despite facing similar risks or adversities. By fostering resilience amongst children and young people we can equip them with the ability to succeed despite adversity.

Resilience is influenced by both risk and protective factors. Resilience is not a fixed or immutable characteristic but a dynamic process that is determined by multiple factors, and although influenced by individual characteristics is also influenced by intrapersonal, familial, extra-familial, social and contextual factors. This view of resilience reflects an ecological systems understanding of the social/environmental and contextual influences on human development.

Aims and scope

The aim of this project was to review existing literature in order to identify protective factors that contribute to the development of resilience among children, adolescents and young adults. In this review we define resilience as an outcome which occurs in the context of one or more challenges to normative adaptation or adjustment; and which results in observable significant adaptation or adjustment despite the presence of those challenges.

In recognition of the multiple factors that influence resilience, we consider resilience according to an ecological systems theory framework where protective factors relate to one of the following:

- the individual child / young person
- the family
- peers
- school

- the community.

Studies were included in this review if they were primary research, systematic reviews, or meta-analyses *and* included at least two measurement points where protective factors were measured prior to a resilient outcome *and* included empirical data. Studies written in languages other than English were excluded, as were studies that involved participants over the age of 24.

Method

We developed a search strategy which was implemented using five electronic databases (Medline, Embase, PsycINFO, ERIC-EBSCO, PUBMED). These databases were chosen in order to capture literature across the three most relevant disciplines (i.e. medicine, psychology and education).

Results

A total of 4065 publications were identified. Of those, a total of 45 publications were identified as eligible for inclusion after a multi-staged screening and selection process. Most of these were published during the 2000–2014 period.

The majority of the eligible publications reported upon studies undertaken in the USA. The studies most commonly involved a moderately sized sample (150–600 participants). The vast majority were prospective cohort studies.

A breakdown of the number of protective factors identified at each level of the ecological systems theory framework – as well as the categories of protective factors identified for each level – are outlined in Table 1 below.

Table 1: Protective factors of resilience

Level of the ecological systems theory framework	No. of studies	Protective factors identified (organised by category)
Individual	31	<ul style="list-style-type: none"> • Temperament • Demographic factors • Social factors • Intelligence and maturity
Family	20	<ul style="list-style-type: none"> • Parenting factors • Family factors • Child's/young person's relationships with parents/family members • Parent factors • Home environment
Peer	11	<ul style="list-style-type: none"> • Peer/friend social support • Relationships with friends/peers • Peer influences
School	7	<ul style="list-style-type: none"> • Factors which bond children/young people to school • Involvement and participation in school • Factors relating to academic achievement • The quality of preschool
Community	4	<ul style="list-style-type: none"> • Involvement in clubs • Perceived levels of caseworker agency and support • Community acceptance • High levels of socio-political control • Coming from a community with a low level of economic deprivation
Other	1	<ul style="list-style-type: none"> • Composite score combining multiple protective factors

As is evident in Table 1, protective factors which are proximal to the individual (e.g. individual and family-level factors) were the most commonly identified. Fewer studies identified protective factors which were more distal to the individual.

Although the protective factors identified for each level vary, the resilience outcomes measures were mostly related to: health behaviours, mental health outcomes, academic outcomes and outcomes relating to criminal activity.

The adversities experienced by participants at each level largely related to one of the following: illness or health-related issues, natural disasters, violence (as a witness or a victim and including bullying), parent and family-related factors, and socio-demographic characteristics (e.g. teenage mother, poverty, homelessness). These adversities include both discrete events and social conditions.

Individual-level protective factors

Studies examining individual-level protective factors most commonly involved participants aged under the age of 13, followed by those that examined protective factors during adolescence, and a small number examining those factors in early adulthood.

A common protective factor related to demographics, specifically gender. In some studies being male was a protective factor, in others being female. Studies which found gender to be a protective factor examined these in relation to a number of resilience outcomes including emotional resilience, behavioural resilience and not initiating violent behaviour. The next most common protective factors were social competence and intelligence, both of which were found to lead to a range of resilience-related outcomes including crime-related and academic resilience.

Family-level protective factors

Participants in the studies identifying protective factors predictive of resilience at the family level were predominantly adolescents. The most commonly identified protective factors in the family-level studies related to parenting practice and parenting quality, followed by family factors. Many of the adversities at this level related to violence – including bullying, but also community-level violence. Parenting practice and quality led to a range of resilient outcomes in the context of bullying, including social adjustment and emotional resilience.

Compared to family-level studies involving other age groups, family-level studies involving adolescents had a notably greater focus upon protective factors relating to the *family* (e.g. family bonding, time spent with family), as opposed to factors relating to *parenting*. These were found to lead to resilient outcomes including lower levels of violent behaviour,

emotional resilience and prosocial strengths within the context of various adversities including bullying and violence/displacement relating to socio-political events.

Peer-level protective factors

For studies that examined peer-level protective factors, all but one focused on adolescents. Peer/friend social support factors were the most commonly reported peer-level protective factors at this level, and they were found to be protective in regards to academic, behavioural and mental health-related resilience against both adverse events (e.g. suicide bombing) and adverse social conditions (e.g. community violence).

School-level protective factors

Participants in the studies identifying protective factors predictive of resilience at the school level were predominantly adolescents. Commonly identified protective factors in the school-level studies related to factors which bond children/young people to early childhood education and care or school. For young children, factors such as the relationship between students and childcare workers had a range of protective effects in the context of risk factors such as poverty. For older children, bonding and commitment to school were found to be protective in regards to behaviour, academic resilience and adjustment in the context of various risk factors including high-risk neighbourhoods.

Community-level protective factors

Only a small number of protective factors were identified at the community level and all involved adolescent participants. None of these protective factors were common to more than one study. The adversities for participants in community-level studies varied considerably from feelings of personal helplessness to being involved in war as a child soldier. In the context of the latter, community acceptance was a protective factor against internalising and externalising problems. In the context of the former study, higher levels of socio-political control were protective for mental health resilience-related outcomes.

Other protective factors

One study examined a protective factor that could not be categorised into the specific categories listed previously. This was a '*total protective factor*' and was found to predict desistance from criminal offending amongst incarcerated male adolescents.

Discussion

This review attempted to synthesise information about protective factors which lead to resilience, based upon empirical studies. A total of 45 studies were identified. Comparing these studies and the effects they report upon is difficult because they are so diverse. Furthermore, most of the studies had a fairly short follow-up time (12 months or less) and there was a lack of consistency and clarity in the way protective factors were defined.

Individual-level protective factors were the most commonly reported protective factors. Temperament-related factors were associated with good mental health resilience (PTSD symptoms, psychological adjustment); they were also associated with academic resilience and sexual resilience, and health management behaviours.

The most common *family-level protective factors* related to parenting quality and parenting practices, followed by family factors. Factors relating to family life, family conflict and family stability appear to play an important protective role for adolescents who are exposed to community violence, as well as those who are bullying victims or perpetrators.

Peer-level protective factors demonstrate the important role that peers play in providing support to children and young people who are at-risk or experiencing adversity. This suggests that ensuring children and young people are not socially isolated when experiencing risk and adversity is important for promoting resilience.

Protective factors relating to *school* functioning suggest that the factors which bond children and adolescents to school are protective against risk and adversity. The studies also suggest that improving the relationship that students have with their school community as well as with teachers and personnel working within the school may promote resilience amongst students who are at-risk or experiencing adversity.

Community-level protective factors are relatively under-reported, in comparison with the other levels we reported upon. The evidence indicates that protective factors in the community can protect against internalising and externalising problems, poor mental health and problems relating to sexual behaviour.

Recommendations

The following public health policy and research recommendations are based upon the findings of this review. For both the policy and research recommendations we have

attempted to focus upon the VicHealth priority of “build[ing] the right foundation for mental wellbeing” (VicHealth, 2013, p. 35), where mental wellbeing is more than merely the absence of mental illness, but also the epitome of social and emotional wellbeing.

Policy recommendations: public health

- Promoting resilience amongst children and young people requires a systemic approach that incorporates a broad range of factors including family relationships, service systems, school culture, socioeconomic factors, community attitudes and cultural norms.
- Policies that support parents, parenting quality and positive parenting practices are important as these are shown to have protective effects, especially during the early and middle childhood years.
- Policies that are supportive of school-based bullying interventions that incorporate parent and family involvement would also appear to be a wise investment, as support from parents and families has been shown to enhance resilience amongst bullying victims and perpetrators during middle childhood and adolescence.
- Policies that reduce the potential for children and young people to become socially isolated are important – even during early childhood – as peers play a key role in enhancing resilience for children and young people at-risk of poor outcomes, and in the aftermath of traumatic discrete events (e.g. natural disasters).
- Policies relating to education should consider the protective role that school bonding and school commitment can play for children and adolescents at-risk, as both can play a role in enhancing resilience amongst this sub-group. Factors that limit the opportunity for school bonding and commitment amongst at-risk groups (e.g. costly extra-curricular activities) may be detrimental in this respect.
- Within their communities, children and young people benefit from participation (e.g. in local clubs and activities) and opportunities to contribute to the decisions that impact upon them. Therefore, efforts to enhance these opportunities may help promote resilience amongst children and young people.
- Both universal and targeted approaches to enhancing resilience in children / adolescents are required. Resilience is important for all children – and children from any background can experience adversity. However, at-risk children and young people are likely to face a

greater number of adversities – some of which will be chronic and long-standing (e.g. poverty) and, as such, they require targeted support.

Recommendations for further research

- Further investment in research examining resilience factors in early childhood and early adulthood is needed as there is a paucity of studies pertaining to these age groups.
- Future research should examine whether the protective factors examined in this review are relevant to different types of adversities (e.g. discrete events vs. longstanding social adversities). The key question relating to this issue is: are factors that are protective in context of discrete traumatic events also protective in the context of long-standing adverse social conditions?
- Future research designs should incorporate longer follow-up periods in order to determine the extent to which these factors may be protective in the longer term.
- Further research is needed to examine those influences on resilience that are ‘further away’ from the individual child / young person (i.e. distal as opposed to proximal factors) such as community-level protective factors (e.g. social cohesion, social capital), school-level protective factors (e.g. school culture and environment) and peer-level factors.
- There appears to be a comparative dearth of studies regarding adversities especially relevant to the Australian context such as child maltreatment, family violence, parental substance use and the impact of parental joblessness. Research exploring resilience within the context of these adversities would be useful in the Australian context.

Conclusions

This review of the literature on protective factors that contribute to resilience among children, adolescents and young adults identified 45 studies in total. These studies were diverse, reporting upon protective factors across a range of physical, emotional, individual, family and societal domains. Despite these studies measuring resilience using different methods – and in relation to a large number of outcome measures of resilience – many factors were identified which preceded resilient outcomes.

A broad spectrum of adversities were reported across studies, including bullying victimisation, experiencing an earthquake, exposure to violence including mass shootings,

sexual assault, being a child soldier, coming from a low socioeconomic background and having a parent with a history of mental health problems. The duration of these adversities ranged from acute (such as experiencing an earthquake) to the long term (such as coming from a low socioeconomic background) and the duration of follow-up varied accordingly (from one month to more than 10 years).

The outcomes measured were an equally heterogeneous list, including academic success, breaking cycles of violence, mental health outcomes, involvement with the criminal justice system and adopting physical health-promoting behaviours.

Notably, the ability to synthesise findings was impeded considerably by the lack of consistency in which key findings were reported statistically across studies; this made it extremely difficult to make direct comparisons between studies. It is imperative to establish an academic consensus regarding the definition and remit of resilience – including its function as a process, an outcome, or both. Future research should examine this issue as a matter of priority.

Although some studies examined the impact of peer-level, family-level, school-level or community-level protective factors, by far the largest number of protective factors studied related to individual-level factors. These included factors relating to an individual's coping strategies and problem-solving skills and attitudes, all of which can be changed in response to external influences and/or interventions. At the family level, interventions that support parents, parenting quality and positive parenting practices show promise as these factors clearly have positive effects on resilience outcomes for children/young people. At the school level, policies that are supportive of school-based bullying interventions that incorporate parent and family involvement would appear to be of worthwhile. Future investment in mental health promotion – at the individual, family and school levels – is likely to enhance the skills found in this review to be associated with resilience in young people. Finally, the findings of this review demonstrated that families, peers, schools and the community can all play a role in enhancing the resilience of children and youth people. As such, policies that enable a cross-sector, multi-stakeholder response to child / adolescent resilience are likely to have the greatest impact.

Background

What is child and adolescent resilience?

An understanding that children and young people react to adversity in very different ways has given rise to the concept of resilience. We define resilience as the capacity to adjust in response to risk or adversity (e.g. child abuse and neglect, exposure to family and community violence, family dysfunction and conflict, chronic illness). A better understanding of resilience will help shape effective policy responses to the adversities that children and young people experience.

Research over the past four decades has focused attention on the characteristics of individuals who fare well despite such adversity (Murphey et al., 2014). Even though there is a wealth of research into resilience, there are gaps in our understanding about its epidemiology. Contributing factors include inconsistent definitions and theories about the topic.

How is resilience conceptualised?

Resilience can be viewed as a process or an outcome (Olsson et al., 2003). The term is used to refer to a range of different phenomena including the prevention of mental health disturbance, successful adaptation and swift recovery from adverse experiences and post-traumatic psychological growth (Rutten et al., 2013).

Widely accepted as more than merely the 'flip side' of a risk factor, resilience encompasses modifiable psychological and biological characteristics which provide an individual with protection against psychopathology in the face of adversity (Hoge et al., 2007). Adversities, are "disturbances to the function or viability of a system; experiences that threaten adaptation or development" (Wright et al., 2013, p. 17) and can include both discrete adverse events (e.g. experiencing an earthquake), structural inequalities and longstanding social conditions (e.g. low socioeconomic status). It is important to understand how individuals overcome risks and adversities relating to loss, trauma, disadvantage, stress and hardship.

Resilience can be thought of as an ability to experience adversities and successfully overcome them (Calvert, 1997), or an increased likelihood of positive outcomes despite

adversity (Murphey et al., 2014). It is a dynamic process that enables the individual to successfully adapt to severe adversity at any point during the life course (Rutten et al., 2013).

The myriad definitions of resilience typically incorporate two common factors; firstly, the experience of adversity or stress and, secondly, the achievement of positive outcomes despite this adversity or stress (Gartland et al., 2011). Resilience is not the equivalent of invulnerability; rather, it is the capacity to work through and recover from negative events or at-risk situations. Although resilience is a complex concept, resilience does not require “extraordinary talents or resources, but instead depends on fundamental human adaptive systems” (Masten, 2009, p. 32).

Many researchers believe that resilience is not something an individual ‘has’ – a fixed or immutable characteristic – rather, it is a multiply determined developmental process (Cicchetti, 2010). Although there is a focus upon the individual in resilience research and theory (Ungar et al., 2013), there is an evolving understanding that factors beyond the individual also contribute to resilience. According to this view, resilience can be influenced by environmental and contextual factors (Lee et al., 2013; Resnick, 2000).

To address these theoretical differences, a broader socio-ecological model considers not only the child’s and adolescent’s capacity to deal with external stresses, but also the capacity of social networks and external systems (e.g. family, school, health services) to meet the needs of the child and the young person (Ungar et al., 2013). Viewing resilience as an individual, internal capacity risks ‘blaming the victim’ when resilience does not occur (Masten & Obradovic, 2006). Ungar et al (2013) argue for a “decentred understanding of resilience” which recognises that altering the factors that may impact upon the individual contributes more to individual outcomes than the capacity of individuals to change themselves.

The idea that resilience is a biological process (e.g. genetic, neuroanatomical, neurochemical) is also problematic because it undermines the impact that experience has on these processes. This is what Cicchetti et al (2006) refer to as a “reductionist approach” – noting that just as gene expression can influence social behaviour, social experiences such as child maltreatment can impact upon the developing brain and modify gene expression, brain structure and functioning.

What influences resilience during childhood and adolescence?

Research demonstrates that resilience can be influenced by a wide variety of risk and protective factors relating to a person's intrapersonal, familial, extra-familial, social and contextual situation (Lee et al., 2013; Weine, 2011; Miller & MacIntosh, 1999). In children, as Masten and Obradovic (2006) note, "resilience... depends on... interconnected systems in which human development unfolds, such as families, schools, and neighborhoods" (p. 24). The infinite number of permutations of these combined factors may help to explain, in part, the wide range of possible responses to adversity.

Risk factors during childhood and adolescence

There is considerable evidence to demonstrate that many children and young people exposed to adversity adapt successfully over time (Jain et al., 2012). In order to observe, predict and influence an individual's response to adversity, it is vital to understand how various risk and protective factors influence children and adolescents who are 'at risk' of adversity (i.e. those adolescents who, under current conditions and for a variety of reasons, have a low probability of developing into responsible, high-functioning adults (Resnick, 2000)).

The risks faced by an individual exposed to adversity may be altered, and even ameliorated, through the presence of various protective factors (Calvert, 1997). This notion is depicted in Figure 1 (below). In a meta-analysis of the relationship between resilience and a range of variables considered to be related (Lee et al., 2013), the largest effect on resilience was found to stem from protective factors. Risk factors had the next largest impact and demographic factors exerted the third most powerful influence.

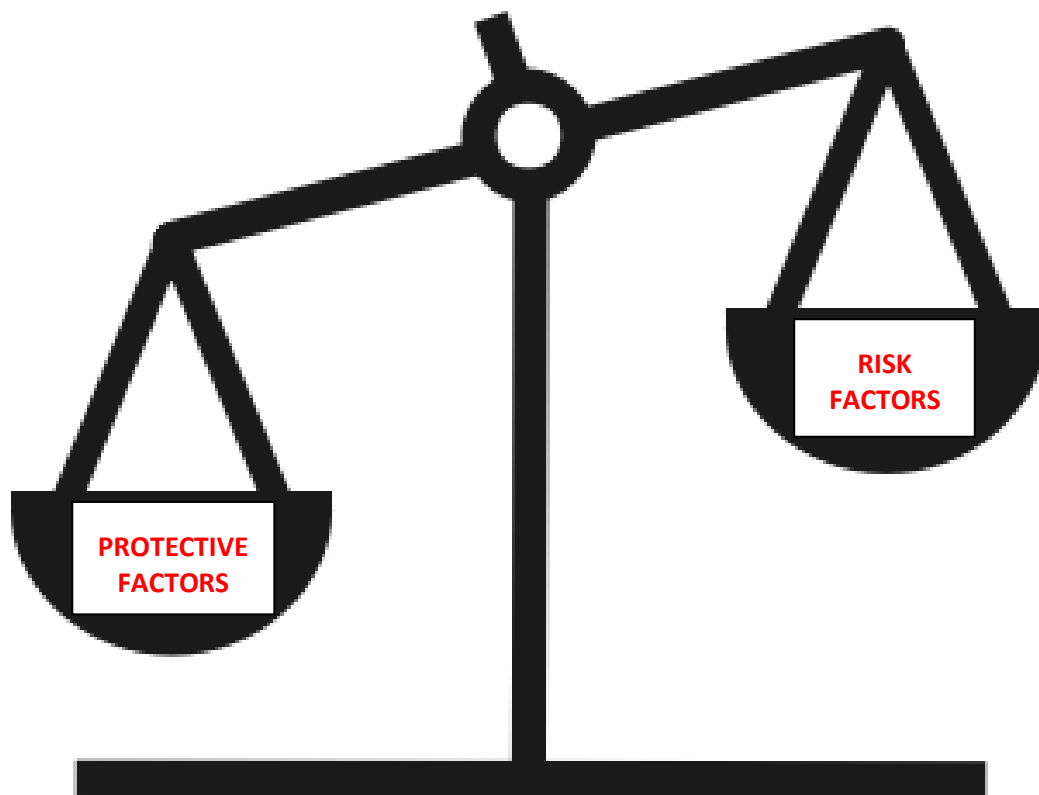


Figure 1: The potential for protective factors to promote resilience in the face of risk or adversity

Protective factors during childhood and adolescence

Protective factors are characteristics that reduce the chances of impaired development either directly or indirectly (Canavan 2008). Despite potentially buffering against the effects of adversity, protective factors do not guarantee resilience, in the same way that adversity does not guarantee mental illness (Murphey et al., 2014).

There are different ways of categorising protective factors amongst children and adolescents. The most basic approach is to identify:

- *Personal* protective factors (or individual characteristics) e.g. self-confidence, perseverance and determination (Lee et al., 2013), an easy-going temperament

(Murphey et al., 2014; Afifi & Macmillan, 2011), religious beliefs and involvement (Heath et al., 1999; Weine, 2011; Merrill Weine et al., 2014)

- *Characteristics of the family* e.g. the presence of warm and engaging parents (Murphey et al., 2014; Weine, 2011; Merrill Weine et al., 2014), a secure attachment to caregivers (Rutten et al., 2013; Afifi & Macmillan, 2011), motivational support from all family members (Calvert, 1997; Smokowski et al., 2000; Weine, 2011; Merrill Weine et al., 2014), high expectations and encouragement of participation and involvement for the adolescent (Calvert, 1997)
- *Broader ecological factors or extra-familial characteristics* e.g. schools, neighbourhood, motivational support from teachers (Weine, 2011; Merrill Weine et al., 2014; Smokowski et al., 2000), access to caring adults outside the family (Murphey et al., 2014) and social support from peers (Weine, 2011; Merrill Weine et al., 2014; Murphey et al., 2014; Jain et al., 2012; Calvert, 1997; Luthar, 2006).¹

Although there are a range of putative protective factors of resilience, evidence from well-designed, high-quality empirical studies examining protective factors in childhood, adolescence and young adulthood and across the ecological systems has rarely been summarised in one publication. The current review aims to achieve this objective.

Aims and scope of the review

Aim of the review

The aim of this project is to review existing literature in order to identify protective factors that contribute to the development of resilience among children, adolescents and young adults.

¹ Adolescents are particularly receptive to influences that are external to their family unit and home life.

Scope of the review

The scope of the review is: epidemiological research which identified protective factors of a resilience outcome, in the context of an adversity or risk.

The concept of psychological resilience is both broad and dynamic. Therefore, any systematic review attempting to explore resilience must clearly articulate the specific theoretical perspective used to guide the review process.

In this review we conceptualise resilience as an *outcome* rather than a *process*. Further, the presence of resilience requires two essential components: exposure to one or more challenges to normative adaptation or adjustment; and observation of significant adaptation or adjustment despite the presence of those challenges. Accordingly, the present review took the following approaches:

- Broadly, we defined resilience as ‘positive adaptation’ despite significant risk factors for normative developmental outcomes. ‘Positive adaptation’ can be defined as “an outcome that is substantially better than what would be expected with respect to the risk circumstance being studied” (Luthar & Prince 2007, p. 293). The definition of resilience used in this review is in line with theoretical, methodological, conceptual and empirical considerations. We acknowledge that all individuals are exposed to some level of short- and longer-term stressors at both the intra- and extra-individual level. However, this review concentrated on studies that used populations at-risk for maladjustment, maladaptive outcomes and significant psychopathology.
- We defined resilience as improvement in outcome(s) conceptually reflecting ‘positive adaptation’ in the face of risk or adversity. In this way, we considered resilience as an *outcome* of multivariate protective factors at both proximal and distal locations to the individual.
- We excluded retrospective studies.
- In line with our focus on resilience as an outcome, studies were included in the review if they included a minimum of two measurement points, with the protective factor being measured at the earlier time point (e.g. Time 1), and the resilient outcome being measured at a later time point (e.g. Time 2). For this reason, studies

that measured protective factors and resilient factors at the same time (i.e. contemporaneously) were excluded from the review.

We have grouped protective factors as they relate to the: individual, family, peer, school, community and other, as depicted in Figure 2.

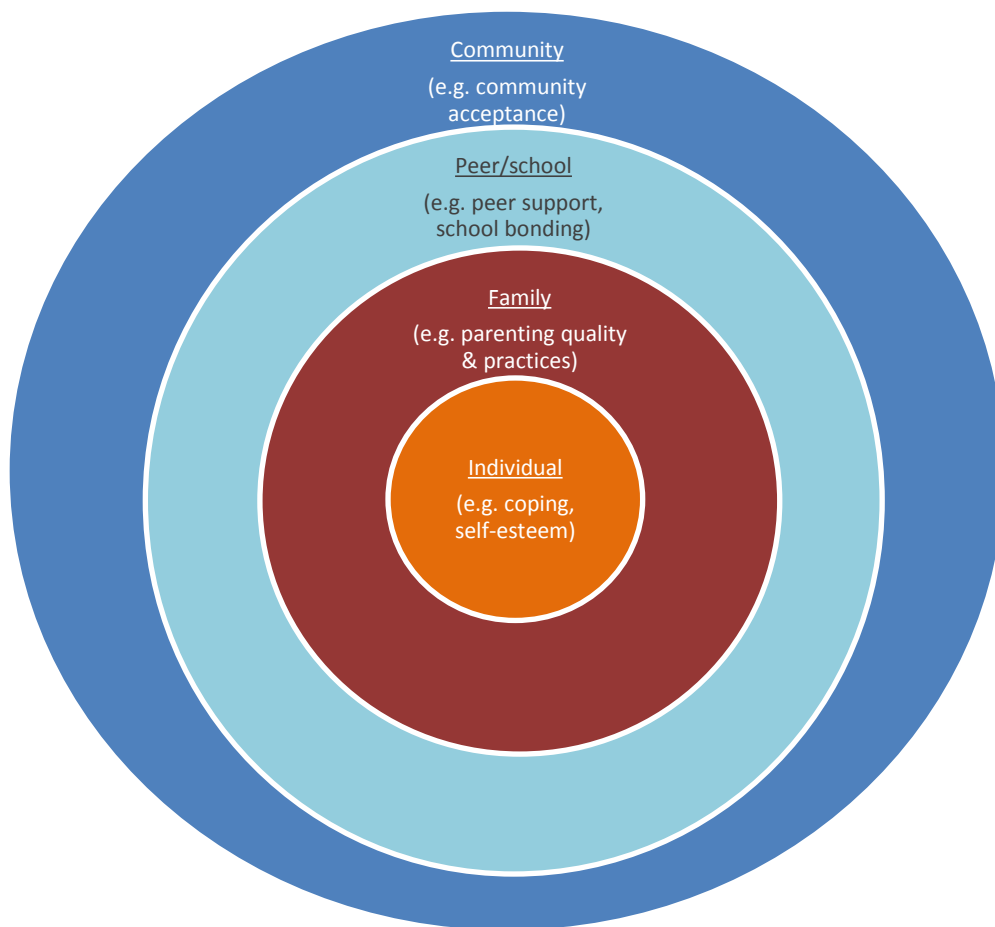


Figure 2: Protective factors at different levels of the ecological model

This is consistent with an ecological systems approach which describes social/environmental contextual influences on human development (Bronfenbrenner, 1979). According to ecological systems approach theory, human development is impacted by social and contextual influences that are organised in nested environmental systems, each of which influence development when these systems interact with the developing person (Bronfenbrenner, 1979).

Methods

Inclusion and exclusion criteria

Inclusion and exclusion criteria for this review were agreed upon by the working group.

These are outlined below:

Inclusion criteria:

- Primary research (e.g. cohort studies & case control studies)
- Systematic reviews
- Meta-analyses
- Studies with at least two measurement points: protective factor(s) measured at baseline (i.e. prior to the resilient outcome) and resilience measured as an outcome (time point after baseline)
- Studies of infants, children and young people aged 0<25 years.

Exclusion criteria:

- Cross-sectional studies
- Studies in languages other than English
- Studies of adults aged 25+ years
- Studies reporting qualitative findings only (empirical data were required in order to report on the strength of the associations between variables). Where a study used mixed methods, the quantitative findings were considered for inclusion.

Note: Academic theses/dissertations, book chapter and grey literature were not included in this review.

Search strategy: database searches

The search strategy was developed by the working group and was approved by VicHealth. Searches were conducted in the following electronic databases. These databases were chosen to ensure literature was captured across medical, psychological and education disciplines.

- Medline – Ovid (searched from 1970–August 2014)

- Embase – OVID (searched from 1970–August 2014)
- PsycINFO – EBSCO (searched from 1970–August 2014)
- ERIC – EBSCO (searched from 1970–August 2014)
- PUBMED - (searched from 1/1/14–August 2014 – search for e-publications not captured through the other searches)

The searches were conducted by one researcher between 20/8/14 – 27/8/14.

Searches were conducted in multiple steps in each of the separate databases:

Initially, key terms relating to the *population* of interest (e.g. infant*, child*, adol*, student*, young adult*) were searched in both titles and abstracts or using controlled vocabulary (e.g. MESH terms, thesaurus terms).

1. *Resilience* key terms (e.g. resilien*) were then searched in titles or abstracts or using controlled vocabulary. When possible, we searched resilience terms using controlled vocabulary and specified that *resilience* had to be a major focus of the paper.
2. We also searched terms to capture *protective factors* (e.g. protec*, predictor*) in titles or abstracts or using controlled vocabulary.
3. We then combined terms relating to the population, terms relating to resilience and terms relating to protective factors using the Boolean Operator “AND”.
4. Where possible, limits (parameters) were applied to the searches – all searches were limited to the English language and humans.
5. A date of publication limiter was applied – only papers from 1970 were included, given that this is when resilience research emerged (Masten, 2011).

Steps 1–6 were performed in Medline, Embase, PsycINFO and ERIC. We also searched the term ‘resilience’ in Pubmed from January 2014 to August 2014, in an attempt to capture e-publications prior to print.

Screening and selection process

Once searches were conducted in each database, the results of the search were exported into the Reference Manager software “Endnote X7”. Following this, duplicate records were identified and removed.

Titles were scanned by two independent researchers to identify titles which were off-topic. Titles which were definitely not of interest or clearly irrelevant titles were removed. As a quality assurance measure, 10% of titles were scanned in duplicate. Of the 300 titles which were scanned in duplicate, the reviewers agreed on 96% of these (n= 289).

Of the records which were retained after screening titles, only records from journal articles were considered for inclusion. All abstracts were reviewed in duplicate and decisions to include/exclude abstracts were made by two independent reviewers against the inclusion/exclusion criteria. Discrepant decisions were discussed between the dual reviewers to reach consensus.

Full-texts of papers which were potentially relevant after having read title/abstracts were then retrieved, and read by five reviewers. Final decisions to include papers were based on the inclusion/exclusion criteria. Reasons for excluding papers were also documented.

Data extraction of primary studies which met the inclusion criteria was then undertaken using a standard data extraction form which collected information about the study characteristics, the protective factors identified (and the age at which they were identified), resilience outcomes (and the age at which they were measured), the adversity/risk examined in the study, the statistical methods used and findings of the study. Also included in the data extraction form was information relating to quality of the studies based on the National Health and Medical Research Council (NHMRC) Levels of Evidence (The National Health and Medical Research Council, 2009).

Results

Search results

A total of 4065 records were identified in the initial search (see Table 2). The majority of these results were from PsycINFO. No additional studies were identified via experts.

Table 2: Results of initial search

Database	Initial search: Number of results
Medline	683
Embase	744
PsycINFO	2008
ERIC	502
PubMed	128
Total	4065

Of the initial 4065 results, there were 1284 duplicate records which were removed, leaving 2781 titles that were screened. After scanning the titles, 1539 possibly relevant records were identified. Only journal articles were retained from this point forward (i.e. thesis n = 411, reports n = 30, book sections n = 169, books n = 43 were excluded), which left 886 abstracts to be reviewed. Of those abstracts, 251 were considered as potentially relevant for inclusion in this review. Full text of the 251 papers were retrieved and were read against the inclusion/exclusion criteria. On reading the full texts, 45 papers were eligible for inclusion in the review. A breakdown of this process and results at each stage can be viewed in Appendix 1.

Study characteristics

A description of the study characteristics are presented in Appendix 2. Included in Appendix 2 are studies which may be of particular interest to VicHealth (as indicated with an asterisk against the study authors' names). These highlighted studies report a positive (strengths-based) resilience outcome which is relevant to VicHealth priorities of improving mental wellbeing; had at least a moderate sample size; or was deemed relevant in the Australian context.

Across the 45 included studies in the review, the majority of studies which met the inclusion criteria originated from the United States of America (USA). This was followed by Commonwealth countries including the United Kingdom (UK), Australia, and New Zealand (NZ). Studies included both male and female participants. Notably, however, many of the studies we identified failed to provide a breakdown of the participants according to gender. Of the studies that provided a breakdown by gender, six had all female samples, three had all male samples, and the majority of the remaining studies contained relatively equal proportions of males and females. Of the studies that reported on the ethnic diversity of the sample, White participants were generally over-represented compared with non-White participants (e.g. Hispanic, African-American). Other demographic factors, such as socioeconomic status (SES), were not reported consistently across the literature.

The studies reviewed in this report were primarily published between the year 2000 and 2014 (41 studies), with the remaining studies published between 1995 and 1999.

Sample size was diverse across the studies reviewed, although there were three broad sample size categories: large ($n > 1000$), moderate ($n = 150-600$) and small ($n < 150$). The majority of studies reviewed were moderate in size.

All included studies had at least two measurement points, whereby protective factors were measured at baseline, and resilience outcomes measured at the post-baseline follow-up time point(s). Typically, studies utilised data from two major sources: primary sources (samples explicitly sourced for the purpose of the study being conducted) and secondary sources (adapted archival national survey data or large longitudinal cohort studies). Notably, all studies met the criteria for Level 2 Evidence described in the National Health and Medical Research Council (NHMRC) evidence hierarchy (The National Health and Medical Research Council, 2009). A large majority of included studies were prospective cohort studies.

Finally, it was apparent that a variety of statistics have been used in the included studies making it difficult to interpret findings across studies. Likewise there was little consistency in the way that key statistics were presented across studies. To aid in the interpretation of the findings of individual studies a description of some of the common statistics used in the included studies is provided in Appendix 3.

Individual-level findings

A list of the individual-level protective factors of resilience can be found in Appendix 4. A total of 30 studies identified protective factors which were shown to be predictive of resilience, at the individual level, in children and/or young people. A breakdown of the different individual level protective factors identified across the one or more studies can be seen in Table 3.

Table 3: Individual-level protective factors

Protective factor	Number of studies	Studies (author)
Temperament	10	
Adaptability		Mitchell et al., 2004
Problem-solving		Zhang et al., 2014
Self-esteem		Hess et al., 2002
Emotional resilience		Sapouna & Wolke, 2013
Mental flexibility		Qouta et al., 2001
Empowerment		Daigneault et al., 2007
Coping		Rew et al., 2012
Self-regulation		Flouri et al., 2014
Prosocial attitudes		McVie, 2014
Internal locus of control		Cappella & Weinstein, 2001
Demographic	7	
Hispanic ethnicity		Eshbaugh, 2006
White ethnicity		Cappella & Weinstein, 2001
Male gender		Leon et al., 2008; McVie 2014; Sapouna & Wolke, 2013
Female gender		Hyman et al. 2010; McVie 2014; Sapouna & Wolke, 2013
High income background		Cappella & Weinstein, 2001

Social	6	
Social competence		Cabaj et al., 2014; Reynolds, 1998; Leon et al., 2008
Social cognitions		Brookmeyer et al., 2005
Social support		Betancourt et al., 2010; Hammack et al., 2004
Intelligence/maturity	6	
Intelligence (IQ score)		Masten et al., 1999; Pargas et al., 2010; Vanderbilt-Adriance & Shaw, 2008
Verbal cognitive ability		Flouri et al., 2014
High language development		Rhule et al., 2006
Maternal maturity		Hess et al., 2002

In regards to the general characteristics of these studies, they were published between 1998 and 2014 and measured protective factors between the ages of two and 22 years. Thirteen studies measured protective factors at age 12 or below, seven studies measured them between 13 and 17, one study measured them at 18 or above, and the age was unclear or the study measured protective factors across more than one of these age bands in nine studies. The amount of time between baseline measurement of protective factors and follow-up measurement of resilience varied from 1.3 years to 10 years, with many of the included studies in this domain having a follow-up period of 2–4 years or less.

A range of resilient outcomes were measured and these included – but were not limited to – depressive symptoms, post-traumatic stress symptoms, pregnancy, social resilience, levels of externalising behaviours, participating in school, lack of re-offending, psychological adjustment and academic resilience. Similarly, and given the number of studies identifying protective factors at the individual level, a range of adversities were encountered by study participants. Some were physical health-related (for example, asthma symptomatology (Mitchell et al., 2004)), others related to environmental adversity, such as experiencing an earthquake (Zhang et al., 2014), or becoming homeless (Hyman et al., 2011), whilst others

still related to mental health adversity, such as psychosocial stress (Masten et al., 1999; Haefel & Vargas, 2011).

The protective factor which was most frequently studied (and shown to exert a powerful influence) was gender, with both male gender (Leon et al. 2008; McVie 2014; Sapouna & Wolke 2013) and female gender (Hyman et al., 2010; McVie, 2014; Sapouna & Wolke 2013) being shown to be protective in different studies and settings. This was reported in four studies and was followed by social competence (Cabaj, 2014; Reynolds, 1998; Leon et al., 2008), and intelligence (Masten et al., 1999; Pargas, 2010; Vanderbilt-Adriance & Shaw, 2008), reported in three studies each.

Of interest was that some of the adversities measured in different studies could be considered to be largely independent of the protective factors measured. These included:

- Having an internal locus of control and good problem-solving abilities – in relation to experiencing an earthquake (Zhang et al., 2014)
- Greater language development – in relation to becoming a teen mother (Rhule et al., 2006)
- Intelligence – in relation to being the child of a mother with a history of depression (Pargas et al., 2010) or being from a lower socioeconomic background (Vanderbilt-Adriance & Shaw, 2008)
- Self-regulation – in relation to coming from a lower socioeconomic background (Flouri et al., 2014)
- Gender – in relation to being a victim of bullying (McVie et al., 2014; Sapouna & Wolke, 2013).

Other adversities, conversely, appeared to be inextricably linked to the protective factors measured. These included:

- Childbearing attitudes – in relation to becoming a teen mother (East et al., 2006)
- Maternal maturity and self-esteem – in relation to becoming a teen mother (Hess et al., 2002)
- Temperament – in relation to witnessing domestic violence (Martinez-Torteya et al., 2009)
- Low levels of externalising behaviour – in relation to becoming a teen mother (Rhule et al., 2006)

- Gender – in relation to experiencing poverty (Reynolds et al., 1998) or being in the child welfare system (Leon et al., 2008)
- Emotional competence – in relation to being in the child welfare system (Leon et al., 2008)
- Social cognitions – in relation to witnessing community violence (Brookmeyer et al., 2005)
- Empowerment – in relation to experiencing childhood sexual abuse (Daigneault et al., 2007)
- Coming from a higher socioeconomic background – in relation to being academically at-risk (as measured by low reading proficiency upon entering high school) (Cappella & Weinstein, 2001)
- Perceived social support – in relation to witnessing community violence (Hammack et al., 2004)
- Social support – in relation to being a child soldier (Betancourt et al., 2010)
- Low levels of social alienation – in relation to being a victim of bullying (McVie et al., 2014)
- Self-esteem – in relation to being a victim of bullying (Sapouna & Wolke, 2013).

The protective factors identified can be grouped broadly into four categories:

- temperament factors
- demographic factors
- social-based factors
- intelligence and maturity factors.

A brief description of each of these categories is below.

1) Temperament-related

There were numerous temperament-related protective factors shown to be predictive of resilience in young people and these were diverse in nature. These included:

- adaptability; in relation to asthma management behaviours (Mitchell et al., 2004)
- problem solving; in relation to post-traumatic stress symptoms after experiencing an earthquake (Zhang et al., 2014)

- self-esteem; in relation to adapting to becoming an adolescent mother (Hess et al., 2002)
- emotional and behavioural resilience; in relation to responding to bullying victimisation (Sapouna & Wolke, 2013)
- mental flexibility; in relation to positive psychological adjustment (Qouta et al., 2001)
- mistrust and empowerment; in relation to developmental sexual pathways of sexually abused adolescents (Daigneault et al., 2007)
- coping; in relation to overcoming low SES to achieve scholastic competence (Rew et al., 2012)
- self-regulation; in relation to subsequent internalising behaviours (Flouri et al., 2014)
- prosocial attitudes; in relation to initiating violent behaviours after bullying victimisation (McVie, 2014)
- having an internal locus of control; in relation to academic resilience (Cappella & Weinstein, 2001).

2) Demographic-related

Protective factors related to participants' demographics were identified in seven studies (Reynolds, 1998; Leon et al., 2008; Hyman et al., 2011; Cappella & Weinstein, 2001; McVie, 2014; Eshbaugh, 2006; Sapouna & Wolke, 2013). In Eshbaugh's (2006) study of adolescent mothers, participants identifying as Hispanic were shown to be more resilient than their non-Hispanic peers, whilst Cappella and Weinstein (2001) found that being Caucasian was a protective factor for higher levels of academic resilience. Being either male (Leon et al., 2008; McVie, 2014; Sapouna & Wolke, 2013) or female (McVie, 2014; Hyman et al., 2010; Sapouna & Wolke, 2013) was shown to be a protective factor in other studies measuring emotional resilience, behavioural resilience and resilience against initiating violent behaviour. Coming from a higher income background was also shown to be a protective factor of academic resilience (Cappella & Weinstein, 2001).

3) Social competence/cognition/support

Three social competence/social based protective factors were identified in a total of six studies (Cabaj et al., 2014; Leon et al., 2008; Reynolds, 1998; Betancourt et al., 2010; Brookmeyer et al., 2005; Hammack et al., 2004). Social competence, which refers to a person's ability to successfully navigate social interactions in a range of settings, was identified as a protective factor in three studies investigating a variety of resilience outcomes (Cabaj et al., 2014; Reynolds, 1998; Leon et al., 2008). In a study by Brookmeyer and colleagues (2005) examining protective factors which enable adolescents from violent environments to avoid committing violent acts, social cognitions were identified as being protective for crime-related resilience. Perceived social support was also identified in two studies as being a protective factor (Betancourt et al., 2010; Hammack et al., 2004).

4) Intelligence and maturity-based

Protective factors related to participants' intelligence, maturity and development were highlighted in six studies (Masten et al., 1999; Pargas et al., 2010; Vanderbilt-Adriance & Shaw, 2008; Flouri et al., 2014; Hess et al., 2002; Rhule et al., 2006). Intelligence, as measured by participants' IQ score, was identified in three studies (Masten et al., 1999; Pargas et al., 2010; Vanderbilt-Adriance & Shaw, 2008), and verbal cognitive ability was identified as protective for academic resilience in Flouri and colleagues' study of the impact of childhood poverty (Flouri et al., 2014). Similarly, Rhule and colleagues reported that high language development was a protective factor in a study examining the children of adolescent mothers (Rhule et al., 2006). In another study of adolescent mothers, Hess and colleagues (Hess et al., 2002) found that maternal maturity was a protective factor.

The following protective factors could be, to varying degrees, considered malleable: problem-solving ability (Zhang et al., 2014), perceived social support (Hammack et al., 2004), attitudes toward childbearing (East et al., 2006), maternal maturity (Hess et al., 2002), empowerment (Daigneault et al., 2007), mental flexibility (Qouta et al., 2001), self-esteem (Hess et al., 2002), enhancing cognitive style (Haefffel & Vargas, 2011) and persistence at tasks (Rew et al., 2012). Other factors are considerably less amenable to change: adaptability (Mitchell et al., 2004), perceived social competence (Reynolds, 1998; Leon et al., 2008; Cabaj et al., 2014), greater language development (beyond a certain age) (Rhule et al., 2006), lower levels of externalising behaviour (Rhule et al., 2006), intelligence scores (Pargas et al.,

2010; Vanderbilt-Adriance & Shaw, 2008), ego resilience (Causadias et al., 2012), having an internal locus of control (Zhang et al., 2014; Cappella & Weinstein, 2001), temperament (Cabaj et al., 2014), mistrust (Daigneault et al., 2007), coming from a higher income background (Cappella & Weinstein, 2001), participant gender (Reynolds, 1998; Leon et al., 2008; Hyman et al., 2011; Cappella & Weinstein, 2001) and participant ethnicity (Eshbaugh, 2006; Cappella & Weinstein, 2001).

Family-level findings

A total of 20 studies identified protective factors at the family level which predicted resilience outcomes. The studies were undertaken between 1987 and 2014. Of these studies, family level protective factors were identified between 6 months to 10 years prior to the resilient outcome being measured; however, for most of these studies the protective factors were identified one to two years prior to the resilient outcome. This limits the extent to which we can determine the impact of the protective factor in the long term (see Appendix 5).

The majority of protective factors were examined in adolescence, followed by those that examined protective factors in childhood, and then those that examined early childhood.² None of the studies we found identified protective family factors in individuals above the age of 19.

The family-level protective factors we identified can be organised according to five broad categories. From the most to the least common they are:

- *parenting factors* (i.e. parenting quality and practices) (e.g. positive parenting, parental monitoring, parent interest in education)
- *family factors* (e.g. low level parental conflict, family unity, relationships between other family members, level of support available to family)
- *child's/young person's relationships with parents/family members* (e.g. attachment to parents, relationship with siblings)

² Two studies examined outcomes in two separate age groups. For one study the age group was unclear (Dubow et al., 2001); however, as the students were drawn from elementary and junior high, the participants were classified as adolescents.

- *parent factors* (e.g. maternal depressive symptoms, age of mother when child/young person was born)
- *home environment* (e.g. positive atmosphere in the home).

A breakdown of the different family-level protective factors identified in one or more of the included studies are detailed in Table 4. Some studies examined protective factors in more than one of the five categories listed above.

A range of resilient outcomes were examined in these studies including externalising behaviours (e.g. low levels of antisocial behaviour), internalising problems (e.g. lower level of anxiety symptoms), adjustment (e.g. behavioural, social, academic adjustment), health (e.g. not becoming pregnant during teenage years, not smoking), attitudes (e.g. positive future expectations), emotional and behavioural resilience and outcomes relating to criminal activity (e.g. participation in violence, number and type of criminal offences).

Table 4: Family protective factors

Protective factor	Number of studies	Studies (author)
Parenting factors (i.e. parenting quality and practices)	12	McVie, 2014; Vanderbilt-Adriance & Shaw, 2008; Wolke et al., 2013; Pargas et al., 2010; Bowes et al., 2010; Stevens et al., 2011; Brookmeyer et al., 2005; East et al., 2006; Rhule et al., 2006; Tiet et al., 2010; Reynolds et al., 1998; Leon et al., 2008
Family factors	8	Hess et al., 2002; Tiet et al., 2010; Panter-Brick et al., 2014; Jain et al., 2012; Hammack et al., 2004; Dubow et al., 2001; McVie, 2014; Sapouna et al., 2013
Relationships with parents/family members	7	Salzinger et al., 2011; Rhule et al., 2006; Tiet et al., 2010; Bowes et al., 2010; Wolke et al., 2013; Hammack et al., 2004; Sapouna & Wolke, 2013
Parent factors	2	Rhule et al., 2006; Stanton et al., 1995
Home environment	2	Bowes et al., 2010; Panter-Brick et al., 2014

Adversities / risks for participants in the included studies were:

- systemic (e.g. poverty and socioeconomic status) (Reynolds, 1998; Vanderbilt-Adriance & Shaw, 2008)
- community-related (e.g. witness of community violence, victim of community violence, high-risk neighbourhood) (Hammack et al., 2004; Jain et al., 2012; Salzinger et al., 2011; Tiet et al., 2010; Panter-Brick et al., 2014; Brookmeyer et al., 2005; Dubow et al., 2001)
- family-related (e.g. maternal depressive symptoms, adolescent mother) (East et al., 2006; Pargas et al., 2010; Rhule et al., 2006)
- peer-related (e.g. bullying victimisation, bullying perpetration, seeing a friend smoke, adolescent delinquency) (Bowes et al., 2010; East et al., 2006; McVie, 2014; Sapouna & Wolke, 2013; Stevens et al., 2011; Stanton et al., 1995)
- child/adolescent health-related (e.g. low weight at birth, teenage pregnancy) (Hess et al., 2002; Wolke et al., 2013)
- relating to care arrangements (e.g. in the welfare system) (Leon et al., 2008).

Some of these adversities are largely independent of the protective factors identified, such as: maternal closeness in the context of exposure to community violence (Hammack et al., 2004); parent expectations in the context of poverty and related risk factors (Reynolds et al., 1998). Other adversities are clearly related to the protective factors identified such as parental monitoring in the context of high-level early adolescent delinquency (Stevens et al., 2011). Notably, of the 20 studies that included a family-level resilient factor, nine included participants whose adversity/risk factor related to violence (including bullying) (Bowes et al., 2010; Brookmeyer et al., 2005; Hammack et al., 2004; Jain et al., 2012; McVie 2014; Panter-Brick et al., 2014; Salzinger et al., 2011; Sapouna & Wolke 2013; Stevens et al., 2011).

In regards to the protective factors examined in these studies, the majority – such as parenting style, parental conflict and atmosphere in the home – could be altered via interventions involving individual families; although some would be easier to change than others. For example, parenting practices are likely to be easier to change than parent–child attachment, especially once a child has reached adolescence. Clearly, however, there are a range of factors that influence factors such as parenting style, parenting conflict and atmosphere in the home. Interventions that target individual families may be effective to a

certain extent, but it will depend also upon other contextual factors (e.g. social support, community characteristics).

Other factors would require change at the wider community or socio-cultural level. For example, if family support is a protective factor for adolescents exposed to community violence (see Jain et al., 2012), then changes such as improved support for families through services, improved social cohesion in order that families receive greater informal support in their community, and socioeconomic changes that facilitate those processes could reduce the impact of community violence on at-risk adolescents.

Two studies examined family-level protective factors during early childhood – the majority of those factors related to parent and parenting factors (Rhule et al., 2006; Vanderbilt-Adriance et al., 2008). The adversities experienced by the participants in both studies were not discrete events, but social conditions – Rhule et al.'s (2006) study focused on children of adolescent mothers, whereas Vanderbilt-Adriance & Shaw's (2008) study examined children from low socioeconomic status backgrounds.

Vanderbilt-Adriance & Shaw's (2008) study found that in the context of low socioeconomic status, nurturing maternal parenting when children were aged 2 had a significant effect on positive social adjustment of children at age 11–12 (Vanderbilt-Adriance & Shaw 2008). Rhule et al.'s (2006) study found that low-level maternal depressive symptoms were protective factors for a number of adjustment outcomes at Grade 3 for the children of adolescent mothers. Secure attachment during infancy was also found to be a marginally significant predictor of positive social adjustment amongst those children (Rhule et al., 2006).

Both of these studies highlight the importance of parent or maternal mental health interventions during infancy where there is a risk of poor outcomes (e.g. poverty, teenage mother) as a means of ensuring positive adjustment outcomes in childhood. Clearly, parenting factors in early childhood are highly important to resilience outcomes in the context of adverse social conditions. Yet, it is also clear that interventions to support children living in adverse *social circumstances* require a long-term, sustained, multi-systemic approach that seeks to put in place a range of protective factors that go beyond parent mental health and parenting quality and practices.

Six studies examined family-level protective factors in childhood, with the majority of protective factors relating to parenting quality and practices, and a small number focusing on children's relationships with parents/family and the home environment. Two studies focused on participants who had experienced adverse *events* (namely bullying victimisation), whereas the other two focused on participants who had experienced adverse *conditions* (very premature / very low birth-weight, low socioeconomic status).

Vanderbilt-Adriance & Shaw's (2008) study, which examined protective factors during early childhood (2 years, see above) and during childhood (5–6 years), suggests that in the context of a low socioeconomic household the quality of the parent–child relationship during childhood has a significant effect on positive social adjustment of children at age 11–12 (Vanderbilt-Adriance & Shaw 2008).

Parenting quality and practices were identified as protective factors in two other studies focusing on the 6–12 age group, specifically amongst children who experienced bullying victimisation. It is important to note that an adversity such as bullying victimisation is considerably different to an adversity such as living in a low socioeconomic household – the former typically relates to discrete events, whereas the latter relates to a social condition.

Of the two studies that focused upon bullying victimisation, one examined various forms of resilience as an outcome (Bowes et al., 2010), the other on psychological distress (McVie, 2014). The two studies also identified fairly diverse parenting factors: Bowes et al. (2010) identified maternal warmth as a protective factor, whereas McVie (2014) identified parental interest in education as a protective factor.³ Both studies are limited by relatively short follow-up periods (between two to three years).

Despite their limitations, Bowes et al.'s (2010) and McVie's (2014) studies suggest that the quality of the parenting relationship, as well as parenting practices in regards to schooling, can act as protective factors for children who experience bullying victimisation. Bowes et al. (2010) study also suggests that the child's other relationships in the family, and a positive environment in the home, are protective in circumstances of bullying victimisation.

³ McVie's (2014) study participants were also older than Bowes et al.'s (2010).

Wolke et al.'s (2013) study was one of the family-level studies that examined participants who faced a health-related adversity. Although examining an adverse condition (as opposed to an adverse event), Wolke et al. (2013) also found that parenting quality and practices – specifically cognitively stimulating and sensitive parenting behaviour – were protective factors in regards to school success, in this case amongst 6 year olds who were born very pre-term or at a very low birth-weight. Wolke et al.'s (2013) study is strengthened by a relatively long follow-up period (seven years).

Fourteen studies examined family-level protective factors during adolescence, with a much greater diversity of protective factors than those studies focusing on early childhood and childhood. Although the majority of protective factors still related to parenting quality and practices – with a notable focus upon protective factors such as parental monitoring, supervision and parent–child conflict – there was also a greater number of protective factors relating to the family (e.g. family support, family unity, family bonding) and relationships within the family. Six of these studies focused on participants who had experienced an adverse *event* – as opposed to an adverse *condition*.

Two studies examined participants whose adversity related to bullying – although one focused on bullying victims (Sapouna & Wolke 2013) and the other on bullying perpetrators (McVie 2014). In keeping with Bowes et al.'s (2010) study, which examined protective factors for childhood bullying victims and identified the importance of supportive family and home environments, both Sapouna & Wolke (2013) and McVie (2014) found that family-level protective factors were important for teenagers involved in bullying (as either victims or perpetrators). A stable family structure (defined as the child living with both birth parents) significantly reduced the probability of being violent at age 17 amongst young people who had been identified as bullying perpetrators at age 15 (McVie 2014). And amongst victims of bullying at age 12–13 years, low levels of family discord and sibling victimisation were found to be significant predictors of emotional resilience to bullying at age 14 (Sapouna & Wolke 2013). Sapouna & Wolke's study, however, is limited by a short-term follow-up period of one to two years.

Family relationships were found in one study to have a protective effect for teenage mothers. Hess et al. (2002) demonstrated that amongst teenage mothers, their relationship with *their* mother was found to predict the level of parental nurturance they showed their infant children (parental nurturance was the resilient outcome). Suggesting an

intergenerational effect, the more balanced and autonomous the teenage mother's relationship with her mother, the more nurturing they were with their infants when they were 6 months of age (Hess et al., 2002). *Perceptions* of family relationships can also have a protective effect in this age group.

Pargas et al.'s (2010) study found that amongst 20 year olds whose mothers had a history of depression during their early childhood, only one parent-child relationship factor examined was a protective factor between age 15 and 20 against an Axis 1 diagnosis⁴: low *perceived* maternal psychological control.

Two other studies that examined protective factors during adolescence relating to the family and home environment involved participants who had experienced a different type of violence to bullying:

- Amongst 11–16 year olds experiencing violence and displacement in Pakistan and Afghanistan, better family unity was found to be associated with higher prosocial strength 12 months after baseline data was collected (Panter-Brick et al., 2014). Better family life at home was also associated with lower psychiatric difficulty amongst the same cohort during the same time period (Panter-Brick et al., 2014).
- Salzinger et al.'s (2011) study found that attachment to parents at Grade 7 decreased the risks of externalising problems at Grade 8 amongst young adolescents exposed to community violence. In the same study attachment to parents was less protective against internalising problems under conditions of high, as opposed to conditions of low community violence exposure (Salzinger et al., 2011).

In some of the studies involving adolescent participants, protective effects depended upon gender of the participant. For example, in a study examining how protective factors buffer adolescents who are witnesses to community violence from subsequently committing violence themselves, parent support had a significant protective effect, but only for males (Brookmeyer et al., 2005). The study had a short-term follow-up, however, of only 12 months. In a study examining the relationship between exposure to community violence and

⁴ An Axis 1 diagnosis is defined in this study as all psychological diagnostic categories except mental retardation and personality disorder (Pargas et al., 2010).

anxiety symptoms, Hammack et al. (2004) found that for girls, time spent with family was a stabilising factor over time for anxiety symptoms. There was no significant interaction between witnessing violence and time with family for boys. In keeping with Brookmeyer et al.'s (2005) study, Hammack et al.'s (2004) study also had a short-term follow-up period.

Two studies focused exclusively on girls (East et al., 2006; Stevens et al., 2011). Stevens et al. (2011) examined factors that promote or discourage delinquency in young women in late adolescence (17–18 years) who displayed high-level early adolescent delinquency. Stevens et al. (2011) found that parental monitoring during early adolescence (12–13 years) significantly decreased the number of offences committed during later adolescence. East et al. (2006) found that protective parenting was a protective factor for teenage girls at increased risk of becoming pregnant in adolescence, even in the presence of high peer risk. Both of these studies are strengthened by relatively long follow-up periods (roughly five years); however, once again it is important to note that high-level early adolescent delinquency is a risk factor rather than an adverse event.

Peer-level findings

This review identified 11 studies which reported peer-level protective factors of resilience (Salzinger et al., 2011; Shahar et al., 2009; Tiet et al., 2010; Criss et al., 2002; Jain et al., 2012; Jain & Cohen, 2013; Banks & Weems, 2014; Self-Brown et al., 2013; Betancourt et al., 2010; Sapouna & Wolke, 2013; Crosnoe & Elder, 2004). These studies were conducted from 2002–2014. Most studies identified protective factors one to two years prior to the outcomes being reported, indicating a relatively short follow-up period. The extent to which these factors are protective in the longer term remains unanswered.

Peer-level protective factors of resilience included factors describing relationships with friends (e.g. friendships, attachment to friends, peer acceptance, being less socially alienated) and peer social support, as well as having positive peer influences and lower levels of involvement with antisocial friends. A breakdown of the different peer-level protective factors identified in one or more included studies are detailed in Table 5. A more detailed description of these studies can be seen in Appendix 6.

Table 5: Peer protective factors

Protective factor	Number of studies	Studies (author)
Relationships with friends	3	
Friendships		Criss et al., 2002
Friend attachment		Salzinger et al., 2011
Peer acceptance		Criss et al., 2002
Less social alienation		Sapouna & Wolke, 2013
Less close friends		Sapouna & Wolke, 2013
Social support	6	
High friend social support		Shahar et al., 2009
Friend support		Jain et al., 2012
Friend support		Jain et al., 2012
Peer social support		Banks & Weems, 2014
Peer social support		Self-Brown et al., 2013
Friend support		Crosnoe & Elder, 2004
Social support		Betancourt et al., 2010
Lower involvement with antisocial friends/positive peer influences	3	
Less involvement with delinquent peers		Tiet et al., 2010
Positive peer influence		Jain et al., 2012
Positive peers		Jain & Cohen, 2013

The peer-level protective factors were associated with the following outcomes: internalising problems (depressive symptoms, emotional resilience, post-traumatic stress disorder, anxiety), externalising problems (including antisocial behaviour), behavioural adaptation/adaptive prosocial behaviour and academic resilience.

All peer-level protective factors are considered malleable; however, some require a systems-level approach to change the attitudes and behaviours of peer groups. The protective factors identified were found to protect (or buffer) from quite a diverse list of adversities including living in a high-risk neighbourhood, being exposed to violence (including community violence, suicidal bombing, being a former child soldier and being bullied), family adversities (including economic disadvantage, violent marital conflict, harsh discipline, parent/family problems at home) and exposure to natural disasters. Evidently, these adversities largely captured adverse violent social conditions and family problems, with few studies examining discrete adverse events. Hence, whether these identified protective factors are protective against other forms of discrete adverse events needs further consideration.

A peer-level protective factor was identified from one large study of over 11,000 participants from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative study of adolescents in Grades 7 through 12 (Crosnoe & Elder, 2004). Eight of the 11 included studies which reported on peer-level protective factors of resilience were based on study samples of less than 1000 participants per study. Hence replication of the study findings with larger samples is recommended.

The large majority of the identified studies reported peer-level protective factors in adolescence ($n = 10$) with only one other study identifying a peer-level protective factor in childhood ($n = 1$).

In the only study which identified protective factors in early childhood, Criss et al. (2002) found that peer acceptance and friendships moderated the link between family adversity and externalising problems, such that the “family adversity variable was significantly associated with child externalizing behavior at low or medium levels of peer acceptance” while “harsh discipline was significantly related to child externalizing behavior for children with average or below average number of friends, but harsh discipline was unrelated to later externalizing for children with relatively many friends” (p. 10).

The most commonly reported peer-level protective factor of resilience was that of 'peer/friend social support'. It is important to be mindful when interpreting these studies that perceived social support availability has been more strongly linked to positive adjustment than actual social support received (Wethington & Kessler, 1986). These studies found that social support was protective against both adverse social conditions and discrete adverse events. Shahar et al. (2008) examined the buffering effects of social support (as measured using the Abbreviated form of the Perceived Social Support Scale) among 7th–9th grade students who had experienced stress due to exposure to suicide bombing. Perceived social support (prior to bombing) buffered against the effects of bombing-related stress and continuous depression. In particular, the interaction between bombing-related perceived stress and friends' social support was a significant predictor of post-bombing depression. For instance, perceived stress due to the bombing was not associated with increased depression for those who had high levels of social support, but was associated for those with low levels of social support from friends. Jain et al. (2012) also found that friends' support increased the odds of emotional resilience for students who were exposed to community violence. This relationship held true for students who had witnessed community violence and adolescents who were victims of community violence. Betancourt et al. (2010) found that social support was positively associated with prosocial/adaptive behaviours over time for former child soldiers.

Similarly, Crosnoe and Elder (2004) noted that friends' support was associated with academic resilience for adolescents who encountered parent- and family-related problems at home. A recent study by Banks and Weems (2014) also found that for students who had been exposed to hurricane Katrina, peer social support (as reported by students with a median age of 11.5 years) predicted lower levels of depressive symptoms, lower levels of PTSD and anxiety six months later. However, once controlling for additional factors (e.g. major life events and distress reported at the initial assessment) peer social support remained a significant protective factor for depressive symptoms only. Self-Brown et al. (2013) also suggested that peer social support may be an important factor associated with resilience for youth affected by Hurricane Katrina.

Two studies identified protective factors about relationships with friends/peers during adolescence. The degree to which one is attached to their friends in grade 7 was found to moderate the relationship between exposure to community violence and internalising

problems a year later, and was particularly protective when exposure to violence was high (Salzinger et al., 2011). Lower levels of social alienation and having fewer close friends at age 12 years also significantly predicted emotional and behavioural resilience two years later, for students who had been victims of bullying (Sapouna & Wolke, 2013). These findings suggest that perhaps having a few *truly* close friends may be more beneficial than having many friends who students' don't feel confident or close enough to confide in when confronting adversity.

Other negative and positive peer influences in adolescence were identified to impact on resilience outcomes in the face of risk and adversity (adverse social situations). Among adolescents in high-risk neighbourhoods, lower involvement with antisocial friends was found to predict better adjustment (academic performance, self-esteem, psychosocial functioning), as well as lower levels of antisocial behavior 12 months later (Tiet et al., 2010). Conversely, positive peer influences in students with a mean age of 13.5 years promoted emotional resilience two years later and also promoted behavioural adjustment seven years later (Jain & Cohen, 2013) for those who had been exposed to community violence (Jain et al., 2012).

School-level findings

A total of seven studies (see Appendix 7) identified protective factors pertaining to school and school-related experiences that predicted resilience (Tiet et al., 2010; Reynolds, 1998; Mikami & Hinshaw, 2006; Cappella & Weinstein, 2001; Crosnoe & Elder, 2004; Derauf et al., 2011; Jain & Cohen, 2013). These studies were conducted between 1998–2013. Across the included studies in this review, school-level protective factors were identified between 1 year to 4.5 years prior to the resilient outcome being measured.

Resilient outcomes in these studies extend beyond scholastic resilience and also include outcomes relating to externalising behaviours (e.g. antisocial behaviour, substance use), internalising problems, adjustment and social resilience. Protective factors included variations of school bonding, school participation, classroom adjustment, future educational expectations and academic achievement. One study identified school-level protective factors relating to preschool quality and experiences. All school-related protective factors identified were considered malleable to change, some of which may require a systems-level

approach to facilitate change. A breakdown of the different school-level protective factors identified in one or more included studies are detailed in Table 6.

Table 6: School-related protective factors

Protective factor	Number of studies	Studies (author)
School bonding	3	
Bonding to teachers		Tiet et al., 2010; Crosnoe & Elder, 2004
School commitment		Tiet et al., 2010
Positive relationships with teachers		Derauf et al., 2011
Involvement and participation in school		
Participation in structured activities	2	Jain & Cohen, 2013
Involvement in extracurricular activities		Tiet et al., 2010
Educational/Academia	3	
Academic competence		Mikami & Hinshaw, 2006
Academic achievement		Reynolds, 1998
Academic curriculum		Cappella & Weinstein, 2001
Future educational expectations		Cappella & Weinstein, 2001
Other	2	
Social/emotional adjustment in classroom		Reynolds, 1998
Educational quality of preschools		Derauf et al., 2011

Variations in adversities/risks were observed in the aforementioned studies. The adversities/risk examined included:

- Academic risk (Cappella & Weinstein 2001)
- Parent and family problems at home (Crosnoe & Elder, 2004)

- Exposure to community violence (Jain & Cohen, 2013)
- At risk due to poverty and associated factors (Reynolds 1998)
- High risk neighbourhoods (Tiet et al., 2010)
- Being diagnosed with ADHD and encountering peer rejection (Mikami & Hinshaw, 2006)
- Child-level risk factors (Derauf et al., 2011)
- Family-level risk factors (Derauf et al., 2011)

Most of the included studies in this domain were based on samples sizes of between approximately 800–2800 participants, with the exception of one smaller study (Mikami & Hinshaw, 2006; n = 209) and one much larger study (Crosnoe & Elder, 2004; n = 11,788).

Of the seven included studies, all but two examined protective factors in adolescence; the exceptions examined protective factors in grade 3 and outcomes in grade 6 (Reynolds, 1998), and protective factors at 36 months and outcomes at 58 months (Derauf et al., 2011).

Factors which bond children and adolescents to school (including bonds to both people and place) were commonly identified school-related protective factors of resilience in childhood and in adolescence. More specifically, the relationship between preschool childcare workers and students at age 3 appeared to buffer the effects of child-level risk factors on general cognitive ability of students at 58 months (Derauf et al., 2011). Similarly, the relationship between childcare workers and students at age 3 had a main effect on self-regulation at 58 months, and also interacted with child-level risk factors and duration of preschool attendance in predicting self-regulation and antisocial/worried behaviour at 58 months (Derauf et al., 2011).

Factors relating to academic achievement, including perceived academic competence as well as academic curriculum were identified protective factors that predicted a range of resilience outcomes, including scholastic resilience and social resilience, as well as lower levels of externalising and internalising problems. With regards to these protective factors in childhood, Reynolds (1998) found that academic achievement in grade 3 was associated with increased likelihood of academic resilience and social resilience (classroom-related adjustment) in grade 6 among at-risk students due to poverty and associated factors.

The educational quality of preschools were found to promote general cognitive ability in the face of child-level risk or family-level risk, and was also predictive of antisocial/worried behaviour in consideration of both child-level risk and duration of preschool attendance

(Derauf et al., 2011). Overall quality of preschool at age 36 months also predicted general cognitive ability at age 58 months in the face of family-level risk (Derauf et al., 2011).

Two additional studies identified school bonding protective factors in adolescence. Tiet et al. (2010) noted that bonding to teachers produced lower levels of antisocial behaviour among adolescents in high-risk neighbourhoods. Likewise, Crosnoe and Elder (2004) found that teacher bonding was predictive of academic resilience in the face of parent- and family-related problems at home. School commitment, which is another factor which bonds young people to conventional society, was also identified as being protective in high-risk neighbourhoods, and was positively correlated with adjustment in adolescents over a 12-month period (Tiet et al., 2010).

Involvement and participation in school and school activities in adolescence was seen to be protective in high-risk neighbourhoods and when exposed to community violence. Jain and Cohen (2013) found that for adolescents (aged 13.5 years who were victims of community violence) time spent participating in meaningful structured activities was associated with increased likelihood of behavioural adaptation two years later. Tiet et al. (2010) also found that for young people aged 11, 13 and 15 years from high-risk neighbourhoods, involvement in extracurricular activities was predictive of adjustment (i.e. academic performance, self-esteem, psychosocial functioning) 12 months later.

Self-perceived scholastic competence was considered important for students (aged 11–18 years) with ADHD, as this protective factor negatively predicted internalising problems, as well as externalising problems and substance use 4.5 years later (Mikami & Hinshaw, 2006).

A study by Cappella and Weinstein (2001) found that for 8th-grade students who were at academic risk, future educational expectations predicted academic resilience in 12th grade, once psychological variables were controlled for in the analysis. This protective factor was no longer statistically significant when other demographic and school environmental factors were included in the modelling. In addition, a student's social and emotional adjustment in the classroom in grade 3 predicted improved scholastic and social resilience in grade 6 for at-risk students due to poverty and associated factors (Reynolds, 1998).

Community-level findings

A total of four studies identified protective factors at the community level which were shown to be predictive of resilience in young people (Betancourt et al., 2010; Leon et al., 2008; McVie, 2014; Zimmerman et al., 1999). These studies were published between 1999 and 2014 and all measured protective factors between the ages of 12 and 17 years. The community-level protective factors identified in each study are detailed in Table 7 (further details provided in Appendix 8). As Table 7 demonstrates, none of the protective factors identified in this domain were identified in more than one study.

Table 7: Community-level protective factors

Protective factor	Number of studies	Studies (author)
Involvement in local clubs	1	Leon et al., 2008
Perceived support	1	Leon et al., 2008
Socio-political control	1	Zimmerman et al., 1999
Community acceptance	1	Betancourt et al., 2010
Low economic deprivation	1	McVie, 2014

The amount of time between baseline measurement of protective factors and follow-up measurement of resilience varied from six months to six years. Two of the four studies had short-term follow-up measurements of two years or less.

Several protective factors were identified in these five studies; these included level of perceived socio-political control (Zimmerman et al., 1999), level of perceived caseworker agency and support (Leon et al., 2008), being involved in local clubs (Leon et al., 2008), community acceptance (Betancourt et al., 2010) and coming from a background of low levels of economic deprivation (McVie, 2014).

A range of adversities were encountered by study participants. These included experiencing personal helplessness (Zimmerman et al., 1999), being the victim of sexual abuse (Leon et al., 2008; Betancourt et al., 2010), being involved in war as a child soldier (including killing or injuring people during war as a child) (Betancourt et al., 2010) and being a victim of bullying during adolescence (McVie, 2014).

As all of the studies focused on adolescent participants, the findings below are not categorised by age group.

In their 2010 study investigating the resilience of former child soldiers in Sierra Leone (Betancourt et al., 2010), Betancourt and colleagues demonstrated that higher levels of community acceptance were protective against subsequent internalising and externalising problems in participants with traumatic histories of war involvement.

Zimmerman and colleagues (1999) examined the effect that socio-political control has on the relationship between personal helplessness and mental health outcomes, with their results showing that higher levels of socio-political control were associated with increased mental health-related resilience including self-esteem. Clearly, however, personal helplessness is not a discrete event. It could be argued that personal helplessness is not in fact an adversity in and of itself, but the consequence of adversity and/or multiple other factors (e.g. temperament, social influences).

In their 2008 study examining the relationship between protective factors and sexual behaviour problems among highly vulnerable youth in the child welfare system who had experienced sexual abuse, Leon and colleagues (Leon et al., 2008) reported that both involvement in clubs and perceived level of caseworker agency and support were protective against levels of sexually ruminative thoughts at 18-month follow-up. This is, however, a short-term follow-up period. The extent to which caseworker agency and support provided at one point in time is protective in the long term, when considering an adversity as potentially damaging as sexual abuse, is questionable.

McVie published a study in 2014 examining the impact of bullying victimisation on subsequent violence and mental health outcomes including subjective distress in a sample of Scottish youths (McVie, 2014); findings from this study demonstrated that a lower level of economic deprivation was protective against increases in anxiety and depression and violence at follow-up.

Two of the protective factors measured in these studies – level of socio-political control (Zimmerman et al., 1999) and level of perceived caseworker agency and support (Leon et al., 2008) – could be considered malleable; although they require different levels of intervention. For example, improving young people’s sense of socio-political control may require a systemic approach that facilitates greater opportunities for young people to contribute to decision-making in society (e.g. at school, in their local community). Improving levels of perceived support, on the other hand, is likely to require interventions at the service-system level.

The remaining factors – specifically, level of community acceptance (Betancourt et al., 2010) and coming from an area of low economic deprivation (McVie, 2014) – may be less amenable to change. In the latter case, however, it may be that targeted interventions would be especially beneficial for bullying perpetrators who live in socioeconomically deprived areas. Furthermore, clearly there are likely to be a range of factors impacting upon the relationship between economic deprivation and participation in violence or psychological distress.

Other

One study (see Appendix 9) identified protective factors that could not be classified at the individual, peer, family, school, or community level (Rennie & Dolan, 2010). This study examined the extent to which a combination of protective factors (referred to as a ‘total protective factor’, and assessed using the Structured Assessment of Violence Risk in Youth (SAVRY) tool) predicted two resilient outcomes of this study relating to criminal behaviour (e.g. no criminal re-offending, no violent re-offending). The adversity for participants was incarceration (Rennie & Dolan, 2010).

The study found that amongst incarcerated teenage boys, a combination of protective factors at age 16 (average), measured using the Structured Assessment of Violence Risk in Youth (SAVRY) tool, was found to be a significant predictor of desistance from criminal offending 12 months post-baseline (Rennie & Dolan, 2010). It was also a significant predictor of desistance from violent criminal offending but it was, as the authors point out, “only just” (Rennie & Dolan, 2010).

Discussion

This review of the literature identified protective factors that contribute to the development of resilience among children, adolescents and young adults. We used an ecological framework to report upon the findings of our systematic review, which aligns with an ecological perspective of resilience – that is, resilience as an outcome that is influenced by multiple factors including community, school, peer, family and individual factors. In the following discussion, we outline the key findings for each of these levels.

Individual-level protective factors were the most commonly reported protective factors, with a total of 31 studies reporting on protective factors at this level. These protective factors can be categorised into four groups: temperament-related, demographic-related, social-based factors and intelligence-related. Temperament-related factors were associated with good mental health resilience (PTSD symptoms, psychological adjustment); they were also associated with academic resilience and sexual resilience, and health management behaviours.

There is some indication that the relationship between specific protective factors and specific outcomes for teenagers who either witness, or are victims of, community violence may be gender specific – that is, community violence impacts upon adolescent males and adolescent females differently, and the factors that protect them also operate differently.

The most common family-level protective factors related to parenting quality and parenting practices, followed by parent–child relationship factors and the family and home environment. Parental supervision and parental monitoring appears to be a protective factor for adolescent girls at risk of teenage pregnancy and juvenile delinquency (during late adolescence), and it also appears to play a role in reducing the probability of participation in violence amongst young people who, in their mid-adolescence, were bullying perpetrators.

During infancy and early childhood, sensitive, nurturing parenting appears to be a protective factor against some problems in middle childhood including poor academic outcomes for very low birth weight and very premature children and social adjustment amongst children from low SES families.

Factors relating to family life, family conflict and family stability appear to play an important protective role for adolescents who are exposed to community violence, as well as those who are bullying victims or perpetrators. In regards to community violence (and not

including bullying), the extent to which these studies (seven in total) are relevant to Australia (all but one were undertaken in the United States, and the other was undertaken in Pakistan and Afghanistan) is questionable as the frequency and level of community violence in the United States, Pakistan and Afghanistan are typically much higher than in Australia. However, the findings of these studies may be useful for service providers working with children and young people from refugee backgrounds who have often experienced trauma, as a result of war, conflict and other extreme forms of violence (Driver & Beltran, 1998; Fazel et al., 2012; Lewig et al., 2010).

Social support was the most commonly reported peer-level protective factor. The findings from the studies we identified that report upon peer-level protective factors demonstrate the important role that peers play in providing support to children and young people who are at-risk or experiencing adversity. This suggests that ensuring children and young people are not socially isolated when experiencing risk and adversity is important for promoting resilience. Building skills and capabilities in young people who may be supporting their friends in need may also be an important undertaking.

The majority of studies reporting on peer-level protective factors focused upon young people in early to mid-adolescence. This is a time when students begin to spend more time with friends, building their social identity and developing a greater sense of autonomy and independence. It is not surprising, therefore, that these studies indicate that peers play a salient role in promoting resilience throughout this phase of life.

Protective factors relating to school functioning were identified in this review. These studies demonstrated that the factors which bond children and adolescents to school were protective against risk and adversity and promoted academic resilience, cognitive ability, self-regulation, adjustment and lower levels of antisocial behaviour. The studies also suggest that improving the relationship that students have with their school community, as well as with teachers and personnel working within the school, may promote resilience amongst students who are at-risk or experiencing adversity.

The majority of studies which identified school-related protective factors identified these in adolescence which highlights the need to further explore school-related protective factors in childhood. In addition, only one study identified a protective factor which could be modified at the school/preschool level. This signals the need for further research to explore protective

factors of resilience within the school environment to inform prevention and intervention efforts to improve resilient outcomes for students.

Community-level protective factors appear to be relatively under-reported, in comparison with the other levels we reported upon. Of the studies we did identify that reported upon community-level protective factors, they indicate that community-level protective factors can protect against internalising and externalising problems, poor mental health and sexual behaviour problems.

Finally, one study included a composite protective factor that did not fit any of the aforementioned categories. This study, which utilised a measure combining various protective factors, indicated that amongst incarcerated boys in middle adolescence, boys at risk of committing violent crime once they are released may need a different level and/or type of support than boys at risk of committing non-violent crimes once they are released. However this is based on the findings of only one study (Rennie & Dolan, 2010).

Important considerations

In light of the findings of our review, it is important to acknowledge that resilience is a complicated and complex area of research. As noted in the introduction, the field is not aided by the myriad definitions and conceptualisations of resilience. This perhaps partly explains why the studies identified in this review were so diverse in almost every respect, including: methodology, analytical approaches, outcome measures and protective factors. This made comparison of studies and effects difficult. The other noteworthy aspect of the studies was the fairly short follow-up time for most of the studies (12 months or less) and the lack of clarity in the way protective factors were defined. Finally, one must consider the degree to which protective factors are independent of the adversities explored and whether the protective factors and outcomes are confounded by other factors when considering the potential for the identified protective factors to influence resilience outcomes.

Limitations of the review

The limitations of this review mostly pertain to the methodology used to identify studies and the criteria for inclusion. For example, narrative reviews were excluded as there were no statistical results that could be extracted; however, these reviews may have provided a greater depth of understanding about a complex concept such as resilience. Furthermore,

using a ‘snowballing’ technique (i.e. looking for more papers from the reviews we identified) may have led to the identification of more papers that met our inclusion criteria.

Grey literature was not accessed for this review and only reviews written in English were included thereby limiting the scope of our findings. However, the findings of our review provide a solid foundation for further reviews that capture a broader scope of literature.

In addition, we included studies which identified protective factors in the face of discrete adverse events as well as adverse social conditions. This made it difficult to determine which factors are protective in what may be very different circumstances (e.g. a natural disaster vs long-standing, entrenched social disadvantage).

Finally, the large diversity of statistics used and the diversity of instruments, adversities and outcome measures used in the included studies meant that we could only provide a descriptive review of the findings.

Recommendations

The following public health policy and research recommendations are based upon the findings of this review. For both the policy and research recommendations we have attempted to focus upon the VicHealth priority of “build[ing] the right foundation for mental wellbeing” (VicHealth, 2013, p. 35), where mental wellbeing is more than merely the absence of mental illness, but also the epitome of social and emotional wellbeing.

Policy recommendations – public health

- Enhancing children’s and young people’s resilience requires a systemic approach that incorporates changes to factors such as family relationships, service systems (e.g. timely support from services), school culture (e.g. promoting inclusion), socioeconomic factors (e.g. addressing risk factors such as poverty) and cultural norms (e.g. attitudes towards decision-making rights of children and young people). Policies that enable a cross-sector, multi-stakeholder response to child / adolescent resilience are likely to have the greatest impact.
- At the family level, interventions that support parents, parenting quality and positive parenting practices are important as these are clearly shown to have positive effects on resilience outcomes for children/young people. Intervening during the early years may

be more effective for some aspects of the parent–child relationship (e.g. attachment) than later intervention; however, support for parents across all stages of their children’s development is important.

- As parent- and family-related factors are clearly protective in the context of bullying victimisation *and* perpetration, school-based bullying interventions that incorporate parent and family involvement and participation would appear to be a wise policy investment. Parents and families need to understand why and how their support can assist children/young people if they encounter bullying behaviour.
- Policies relating to education should consider the protective role that school bonding and school commitment can play for children and adolescents at risk (e.g. those living in high-risk neighbourhoods) and in the aftermath of traumatic discrete events (e.g. natural disasters).
- Factors that discourage at-risk children and adolescents from bonding or participating in school and school activities (e.g. expensive extra-curricular activities, a non-welcoming school environment) also need to be considered when developing educational policies as these are likely to reduce the potential for school-related factors to enhance resilience amongst this sub-group.
- Developing resilience is important for all children and young people, therefore universal approaches to developing resilience are important. However, it could be argued that children and young people experiencing multiple and/or complex adversities (e.g. poverty, history of maltreatment, deprived community) require a greater level of resilience in order to succeed, therefore targeted approaches to developing resilience are also crucial. This review demonstrates that families, peers, schools and the community can all play a role in enhancing at-risk children’s/young people’s resilience.

Recommendations for further research

- Further investment is needed in research examining resilience factors in early childhood and early adulthood as there is a relative paucity of studies for this age group when compared to middle childhood and adolescence;
- Future research should examine whether the protective factors examined in this review are relevant to different types of adversities (e.g. discrete events vs. longstanding social

adversities). Are factors that are protective in context of discrete traumatic events also protective in the context of long-standing adverse social conditions? Future research designs should incorporate longer follow-up periods in order to determine the extent to which these factors may be protective in the longer term.

- Although resilience is recognised as an outcome determined by multiple factors including individual characteristics and intrapersonal, familial, extra-familial, social and contextual factors, research examining distal influences on individual's resilience (as compared to proximal influences) is less common. Further research is needed to examine the external influences on resilience which may be present in communities, schools and amongst peers. For example, are social cohesion and social capital protective factors in the context of certain adversities? Most research to date has focused on individual-level protective factors, and as resilience is an outcome that is influenced by multiple factors, looking systematically beyond the individual is imperative.
- Although bullying and community violence are important adversities to examine, a wealth of studies have been undertaken in this area. There is a comparative dearth of studies regarding other adversities especially relevant to the Australian context such as child maltreatment, family violence (either experiencing or witnessing), parental substance use, and the impact of parental joblessness (e.g. retrenchment, unemployment). Further research examining what factors are protective in the context of these relatively common – and potentially detrimental – adversities is also critical.

Conclusion

This review of the literature on protective factors that contribute to resilience among children, adolescents and young adults identified 45 studies in total. These studies were diverse, reporting upon protective factors across a range of physical, emotional, individual, family and societal domains. Despite these studies measuring resilience using different methods – and in relation to a large number of outcome measures of resilience – many factors were identified which preceded resilient outcomes. A broad spectrum of adversities were reported across studies, including bullying victimisation, experiencing an earthquake, exposure to violence including mass shootings, sexual assault, being a child soldier, coming from a low socioeconomic background, and having a parent with a history of mental health

problems. The duration of these adversities ranged from acute (such as experiencing an earthquake) to the long term (such as coming from a low socioeconomic background) and the duration of follow-up varied accordingly (from one month to more than 10 years). The outcomes measured were an equally heterogeneous list, including academic success, breaking cycles of violence, mental health outcomes, involvement with the criminal justice system and adopting physical health-promoting behaviours.

Notably, the ability to synthesise findings was impeded considerably by the lack of consistency in which key findings were reported statistically across studies; this rendered making direct comparisons between studies extremely difficult. It is imperative to establish an academic consensus regarding the definition and remit of resilience – including its function as a process, an outcome, or both – and future research should examine this issue as a matter of priority.

Whilst some studies examined the impact of peer-level, family-level, school-level or community-level protective factors, by far the largest number of protective factors identified were individual-level factors. These included factors relating to an individual's coping strategies, problem-solving skills and attitudes, all of which can be changed in response to external influences and/or interventions. At the family level, interventions that support parents, parenting quality and positive parenting practices may show promise as these are clearly shown to have positive effects on resilience outcomes for children/young people. At the school level, policies that are supportive of school-based bullying interventions that incorporate parent and family involvement would appear to be of considerable potential value. Future investment in mental health promotion – at the individual, family and school levels – is likely to enhance the skills highlighted in this review to be associated with resilience in young people.

The findings of this review demonstrated that families, peers, schools and the community can all play a role in enhancing the resilience of children and young people. As such, policies that enable a cross-sector, multi-stakeholder response to child / adolescent resilience are likely to have the greatest impact.

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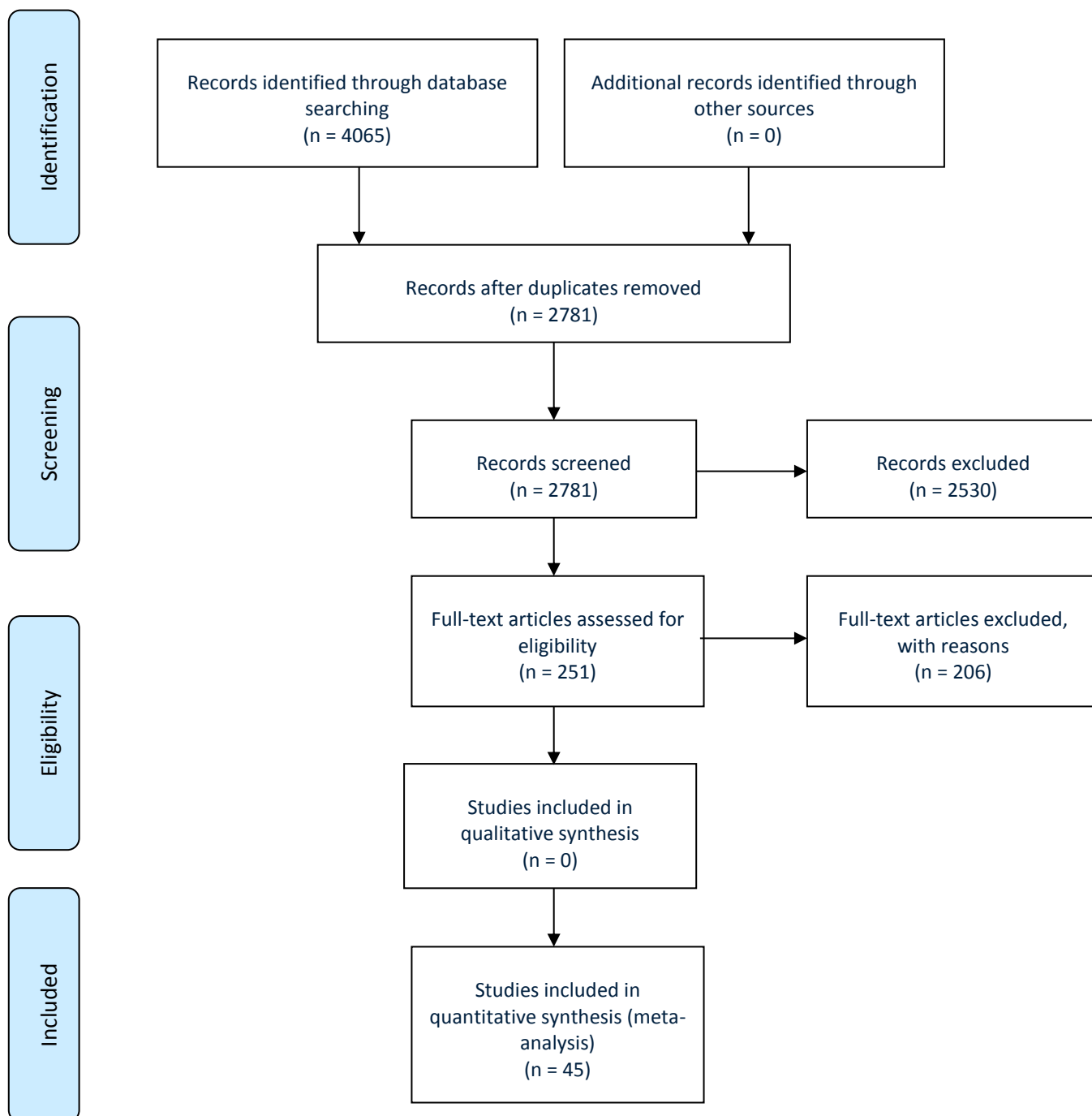
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Appendix 1: PRISMA flow diagram



Note: Source for Prisma flow diagram: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

Appendix 2: Study characteristics

This table provides information about the characteristics of each of the studies identified for inclusion in this report, organised alphabetically. Where direct quotes from publications are used, they are intended to provide clarification regarding the details pertaining to the study.

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Banks & Weems, 2014)	USA	N = 192 (Male: 55%)	Ages 8–15 years Median age = 11.5 years	Children and younger people who experienced hurricane Katrina. 97% African American sample. Baseline was 24 months post hurricane	Prospective cohort study	Level 2
(Betancourt et al., 2010)	Sierra Leone	N = 260 (Male: N= 231, 88%)	Time 1: age 15.1 years (SD 2.2) Time 2: age 17.4 years (SD 2.4) Time 3: age 21.8 years (SD 3.2)	Male and female former child soldiers. All were children who had been involved with the Revolutionary United Front (RUF) and who had then been referred to the IRC's. Disarmament, Demobilization, and Reintegration (DDR) program in Sierra Leone's Kono District	Prospective cohort study	Level 2
(Bowes et al., 2010)*	UK (England and Wales)	N = 1116	Baseline: age 7–10 yrs Time 2: age 10–12 yrs	Participants were members of the Environmental Risk Longitudinal Twin Study	Cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Brookmeyer et al., 2005)	USA	Time 1 N = 2268 Time 2 N = 1599 (Male: 49%; Female: 51%)	6 th –8 th grade adolescents (11–15 years)	Urban adolescents – predominantly minority and low-socioeconomic status	Prospective cohort study	Level 2
(Cabaj et al., 2014)	Calgary, Canada	Survey when children were aged 3 years N = 791 Survey when children were aged 5 years Survey when children were aged 8 years N = 450 Protective factor analysis based on subsample with high risk (N=111) Children with low degree of externalising problems N = 32 Children with high degree of externalising problems N = 43	Age was unclear	Part of the longitudinal community perinatal care cohort (CPC)	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Cappella and Weinstein, 2001)*	USA	N = 1362 (Male: N = 752, 55.2%); Female N = 610, 44.8%)	Time 1 – Grade 8	Subsample of at risk sample based on low 8 th grade reading proficiency	Prospective cohort study	Level 2
(Causadias et al., 2012)*	USA	N = 136 children (Male: N= 75; Female: N = 61)	Data on child cohort reported in paper were measured at: Preschool (ages 4, 5) Elementary school (2 nd /3 rd grade – ages 7–9) Ages 16, 19, 23, 26, 32	Sample drawn from longitudinal study exploring developmental outcomes of at-risk urban children Analysis based on 136 children born to first-time mothers with a mean age of 20 years. 62% White, 15% mixed ethnic background, 19% African-American, and 4% other/unknown	Prospective cohort study	Level 2
(Criss et al., 2002)	USA	At baseline N = 585 (families) Outcomes measured at Grade 2 N =517	Time 1 – measured prior to kindergarten Protective factors – measured at kinder, grade 1 Outcomes – measured at Grade 2	Predominantly middle class	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Crosnoe & Elder, 2004)	USA	N = 11,788	Age 16.1 (SD 1.5)	51% female, 56% White. Uses data from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative study of adolescents in Grades 7 through 12	Prospective cohort study	Level 2
(Daigneault et al., 2007)	Canada	T1 N = 160 T2 N = 86 (100% Female)	11–17 years (M = 14.6 years, SD = 1.4)	Adolescent girls who are the victims of sexual abuse and receiving child protection services – French speaking	Prospective cohort study	Level 2
(Derauf et al., 2011)	UK	2862	3–5 years Time 1 average age of 36 month Time 2 average age of 58 months	Data from study investigating quality of and structure of preschools. English speaking pre-school attendees. *Note: Use of risk is somewhat vague	Prospective cohort study	Level 2
(Dubow et al., 2001)	Not specified	Analysis based on N= 95 Completed time 1 and time 2 assessments	6 th , 7 th and 8 th grade students	This study drawn from larger study examining the effects of a pregnancy prevention program delivered to sixth-grade through	Prospective cohort study (conducted in the context of a prevention program)	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
				<p>eighth-grade students from five inner-city schools</p> <p>“The county in which the schools are located posted the second highest adolescent pregnancy rate in the state; the specific schools were chosen from neighbourhoods with the highest rates in the county. Across the five schools, two-thirds or more of the students qualified for Free and Reduced Lunch rates”</p> <p>“Students who participated in the program showed significant improvement in knowledge of the content of the program and in their ability to discuss sexual issues with others but did not show significant improvement on the variables examined in the present study”</p>		

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(East et al., 2006)	USA	N = 172 Time 1: N= 172 Time 3: N=128 (100% female)	11–16 at intake Time 1: Mean age 13.7 SD = 1.7 Time 3: Mean age 18.6. SD = 1.7	Never been pregnant, living with mother and at least 1 older sister. 67% Latina, 33% African American	Prospective cohort study	Level 2
(Eshbaugh, 2006)	USA	N = 606 (100% female)	Time 1- Mean = 17.6 yrs. SD=1.49	278 African-American, 206 European American, 122 Hispanic teen mothers Low income sample	Prospective cohort study (conducted in the context of a program)	Level 2
(Flouri et al., 2014)	UK	Analytic sample N = 16,916 (Females: N = 8288, 49%)	Analysis was based on data collected at ages 3, 4, 7 years	Sample from The Millennium Cohort Study. “The sample is disproportionately stratified to ensure adequate numbers in the four UK countries and electoral wards with disadvantaged or ethnic minority populations”	Prospective cohort study	Level 2
(Haefel & Vargas, 2011)	USA	N= 128 (completed Time 1 and Time 2 assessments)	Mean age =19.32	Undergraduates from the volunteer psychology participant pool at Notre Dame University	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
		(Male: N=40; Female: N=88)				
(Hammack et al., 2004)	USA	N = 196 Time 1: N = 196 Time 2: N = 159	Time 1 – Grade 6 Time 2 – Grade 7	African-American young adolescents living in inner-city Chicago (6th grade) Schools selected based on high neighbourhood crime statistics for the year preceding data collection	Prospective cohort study	Level 2
(Hess et al., 2002)	USA	N = 181 (n = 148 with complete data) (100% female)	At baseline: Mean age 16.3 years SD = 1.0 Range: 13.5 – 17.9 years	First-time adolescent African American mothers. Sample drawn from mothers enrolled in a longitudinal RCT at home intervention	Prospective cohort study (participants were from a longitudinal randomised controlled trial)	Level 2
(Hyman et al., 2011)	Canada	At baseline N = 82 (Males: N = 45; Female: N = 37)	At baseline, range = 16–19 years	Homeless youth (“absolutely homeless” = “did not have their own place in which to live”) in Ottawa	Prospective cohort study	Level 2
(Jain et al., 2012)*	USA	At baseline N = 1166 (Male: N = 563, 47.5%;	Wave 1 Mean = age 13.5 (11-16) Wave 2 Mean = age 15.5 (12-20) Wave 3 Mean = age 18.1 (15-22)	Adolescents living in Chicago – some exposed to violence, some victims of violence, some neither exposed or victims (i.e.	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
		Female: N = 603, 52.5%)		'unexposed')		
(Jain & Cohen, 2013)	USA	N = 1114 (Male: N = 542, 49%; Female: N = 572, 51%)	Baseline – Mean age = 13.5 years (range 11–16 years) Time 2 – Mean age = 15.5 years (range 12–20 years) Time 3 – Mean age 18.1 years (range 15–22 years)	Random sample part of a multistage probability design. Blacks were over-represented in the witnessed and victim groups	Prospective cohort study	Level 2
(Leon et al., 2008)	USA	N = 142 (Female: 27%) N = 174 identified, N = 142 number for whom data was collected for time 1 & 2	Age 10.4 – 17.9 yrs (13.2 mean, SD 1.9)	Sample drawn from “highly vulnerable youth in the child welfare system” Youth in substitute care exhibiting sexual behavioural problems. 88% of sample African American youth Classified into 5 categories of sexual behaviour problems	Prospective cohort study	Level 2
(Martinez-Torteya et al., 2009)	USA	N = 190 (Mother–child dyads) (Of the 190 children, N = 95 were male)	Mothers at recruitment during pregnancy Mean age = 27.38 (SD = 4.99). Assessment occurred when children were aged 2, 3 and 4	47% Caucasian, 25% African American, 23% multiracial., 2% Hispanic, 2% Native American, 1% Asian	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Masten et al., 1999)	USA	N = 189 (Male: N= 82; Female: N = 107)	At baseline range = 8–12 years (3 rd to 6 th grade)	Urban community sample – diverse in socioeconomic status and family structure	Prospective cohort study	Level 2
(McVie, 2014)	UK, Scotland	N = 3861 (Female: 51%) Response rate: The original cohort was 4300 secondary school students. This cohort represented 92% of the total population of secondary school students who were enrolled to start secondary school in 1998	T1 = 12 (approximately) T2 = 13 T3 = 14 T4 = 15 T5 = 16 T6 = 17		Prospective cohort study	Level 2
(Mikami & Hinshaw, 2006)	USA	N = 209 (100% female)	6–13 yrs at baseline. 11–18 yrs at follow-up	All female. Group 1 = ADHD (140 time 1; 127 retained at time 2); Comparison Group - ethnically matched girls (88 time 1; 82 retained at time 2) 53% Caucasian, 27% African American, 11% Latina, 9% Asian	Cohort study longitudinal	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Mitchell et al., 2004)	USA	31 children and primary caregivers Time 1: N=31 Time 2: N=29 (Male: 50%; Female: 50%)	Child characteristics Time 1 – Mean 9.7 years (range 7.9 – 10.9 years) Time 2 – Mean 11 years (range 8.4 – 12.5)	8–11 year old children diagnosed with asthma by their physician Ethnic minority in urban settings	Prospective cohort study	Level 2
(Panter-Brick et al., 2014)	Pakistan and Afghanistan	N = 331 – Students N = 234 Kabul N = 97 Peshawar N = 234 - Caregivers N = 234 Kabul N = 97 Peshawar	Range: age 11–16 (13.1 mean) (1.59 SD) Follow-up 1 year later	Baseline recruitment of 11-16 year olds and primary caregivers (n=1362 respondents) Stratified school sample, gender balanced. Kabul, Afghanistan (180 boys, 184 girls, 364 caregivers) Peshawar, Pakistan (160 boys, 157 girls, 317 caregivers)	Prospective cohort study	Level 2
(Pargas et al., 2010)	Australia	N = 648 (Male: 48%)	Age 15 years	Predominantly youth at high risk for mother depression, and a low-risk control group	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Qouta et al., 2001)	Palestine	T1: N=108 T2: N=86 (Male: N=42; Female N=44)	Time 1 – age 10–12 years (mean age boys =11 SD =0.70; mean age girls =10.81 SD = 0.73) Time 2 - age 13–15 year (mean age boys =14 SD =0.70; mean age girls =13.81 SD = 0.73)	Palestinian children	Prospective cohort study	Level 2
(Rennie & Dolan, 2010)	UK	N = 135 (Male: 100%)	13-18 (M = 16.14 years; SD = 0.93)	Male adolescents in custody	Prospective cohort study	Level 2
(Rew et al., 2012)*	USA	N = 603 (Female: 55.1%)	Baseline: 10.4 (SD = 0.6) Follow-up: 15.0 (SD = 0.6)	53.6% Latino	Prospective cohort study	Level 2
(Reynolds, 1998)*	USA	N = 1170	Resilience outcomes at age 12 (6 th Grade)	Low-income black sample. 95% black, 5% Hispanic. 75% had participated in an early childhood intervention	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Rhule et al., 2006)*	USA	N = 100 (Mother/child dyads; mothers were recruited when child was age 1) (Children – 54% females)	Mean maternal age at birth was 17.3 years (SD =1.2), range 14.5 – 19.5 years. Assessments used in this analysis were conducted at: <ul style="list-style-type: none"> • Infancy – age 1 (predictors) • Preschool – approx. age 3.5 – 5.5 years (predictors) • Grade 3 (outcome) 	69% Caucasian, 9% African American, 5% Native American, 2% Latino, 14% mixed heritage, 1% Other	Prospective cohort study	Level 2
(Salzinger et al., 2011)	USA	At time 1 N = 667 (Male: N= 335; Female: N=332) Time 2: N = 617 Time 3: N = 590 Time 2 and time 3 surveys were conducted annually in consecutive years	At time 1: 6 th Graders (age 11–14 years)	65% Hispanic, 32% Black, 4% Other. 26% 2 Biological parents, 12% 1 biological parent and 1 partner, 45% single parent, 53% received public assistance, 52% high school education	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Sapouna & Wolke, 2013)*	UK	3136 (Male: 48.5%) No response rate reported	12 – 14 years of age 12 at wave 1 13 wave 2 14 wave 3	94.9% white ethnic background	Prospective cohort	Level 2
(Self-Brown et al., 2013)	USA	N = 426 (Analysis based on N = 417) (Female: 51%) Time 1 N = 388 Time 2 N = 426 Time 3 N = 426 Time 4 N = 426	Mean age = 11.63 years, SD = 2.26	Youths who experienced hurricane Katrina 75% minority sample. 75% were displaced from their home as a result of the Hurricane	Prospective cohort study	Level 2
(Shahar et al., 2009)	Dimona, Israel	N = 90 (Female: 60%) Time 1 (pre-bombing) N=141 Time 2 (post-bombing) N =90	7th – 9th grade	Grades 7–9 pre- and post-exposure to suicide bombings.	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Stanton et al., 1995)	New Zealand	T1 = 705 T2 = 682 T3 = 550 T4 = 546	T1 = 9 years old T2 = 11 years old T3 = 13 years old T4 = 15 years old	Participants are from a longitudinal study that began in infancy	Prospective cohort study	Level 2
(Stevens et al., 2011)	USA	At baseline N = 1297 (100% female)	At baseline = 12–13 years	The sample was most commonly White, non-Hispanic, and had graduated from high school by age 17 or 18 Sample categorised into 2 groups: high and low early adolescent delinquency	Prospective cohort study	Level 2
(Tiet et al., 2010)*	USA	N = 877 (Male: N = 464, 52.9%; Female: N = 413, 47.1%)	Baseline (wave 1) participants were aged 11, 13 and 15 (3 cohorts).	The Denver Youth Survey – study targeted socially disadvantaged neighbourhoods with high crime	Prospective cohort study	Level 2
(Vanderbilt-Adriance & Shaw, 2008)*	USA	N= 226 (100% male)	Assessments occurred when children were 1.5, 2, 3.5, 5, 5.5, 6, 8, 10, 11, and 12 years old	N = 226 – subsample from Pitt Mother and Child Project (PMCP). Urban, low SES ethnically diverse boys i.e. high risk	Prospective cohort study	Level 2

Author/Year	Country	Sample size	Age of participants	Other sample characteristics	Study design	NHMRC Level of Evidence
(Wolke et al., 2013)*	Germany	N = 652 (n=338 preterm/very low birth weight; N=314 control)	Protective factor – measured at age 6 Outcomes- measured at age 13		Prospective cohort study	Level 2
(Zhang et al., 2014)	China	N = 1420 (Males: N=604; Females: N=816)	At baseline Mean age 15.77. SD (1.149) Range 12–20 years		Observational longitudinal design	
(Zimmerman et al., 1999)	USA	N = 172 (Male: 100%) Response rate from T1 to T2 = 68%	Baseline mean age = 16.8 years (SD = 1.32)	African American couple	Prospective cohort study	Level 2

* Indicates a study which reported a positive (strengths-based) resilience outcome which is relevant to VicHealth priorities of improving mental wellbeing; had at least a moderate sample size; or was deemed relevant in the Australian context.

Appendix 3: Summary of common statistics used in included studies

Analysis	Description	Interpretation
Correlation	Linear relationship between two variables	<p>Pearson's product-moment r (when both independent and dependent variables are continuous):</p> <p>0 = no linear relationship .10 = small effect .30 = medium effect .50 = large effect 1 = perfect linear relationship</p> <p>A Pearson correlation coefficient can either be positive (+), negative (-) or equal to zero; the sign indicates the direction of the relationship</p> <p>(See Cohen, J. (1988). <i>Statistical power analysis for the behavioral sciences</i>. Hillsdale, NJ: Erlbaum)</p>
Logistic regression	Strength of association between exposure and a binary outcome. Presents the odds of an outcome in consideration of the presence vs absence of an exposure (as represented by an odds ratio).	<p>Odds ratio (OR)</p> <p>About 1.5 to 1 = 1.5; about 1 to 1.5 = .67 = weak association/small effect size</p> <p>About 2.5 to 1 = 2.5; about 1 to 2.5 = .40 = moderate association/medium effect size</p> <p>About 4 to 1 = 4; about 1 to 4 = .25 = strong association/large effect size</p> <p>About 10 to 1 = 10; about 1 to 10 = .100 or less = very strong association/very large effect size</p> <p>(See: Rosenthal, J. A. (1996). Qualitative descriptors of strength of association and effect size. <i>Journal of Social Service Research</i>, 21(4), 37–59.)</p>

Regression	Relationship between one or more predictor variables (can be either dichotomous or continuous) and a continuous dependent variable.	Standardised beta coefficients = how much dependent variable (standard deviations) will change per standard deviation change in the independent variable
	Multiple regression is used to predict the dependent variable based on more than one independent variable	In multiple regression, the beta coefficient can either be positive (+) or negative (-); the sign indicates the direction of the relationship. For instance a negative beta coefficient indicates that the relationship between the independent predictor variable and dependent variable is negative.
Chi square	Examines distribution of categorical variables between two groups	Larger chi square value = the more unequal the distribution
T- test	Compares means of continuous variables between two groups	The larger the t value the larger the difference between the two groups.

Appendix 4: Protective factors – Individual factors

This table provides details regarding the findings of each of the studies identified that reported upon protective factors relating to the individual level of the ecological framework including: (a) the adversity/risk facing the participants; (b) the protective factor that was examined (and the tool used to measure the protective factor); (c) the age at which the protective factor was measured (for some studies only the grade level, rather than exact age, is provided); (d) the resilience outcome (and the tool used to measure the resilience outcome); (e) the age at which the resilience outcome was measured; (f) the statistical methods used in the study; (g) the findings of the study; and (h) supplementary information.

Direct quotes from the studies are used in some cases to clarify the details of the findings as reported in the publication. The *Supplementary information* column provides information that may assist readers in the interpretation of the statistical information provided in the *Findings* column, as well as any important additional notes regarding the study.

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Mitchell et al., 2004)	Neighbourhood disadvantage	Adaptability (141 item "Behaviour Assessment System for Children" administered to primary caregivers)	Mean 9.7 yrs	Asthma Management Behaviours (Asthma Behavioural Assessment Questionnaire Primary Caregiver report)	Mean 11 years Approx. 1 yr – post baseline	Hierarchical multiple regression	<p>"adaptability at baseline accounted for a significant portion of the variance in asthma management behaviors at follow-up ($B = .36, p < .05, R^2 = .12$)"</p> <p>"the interaction between baseline neighborhood disadvantage and adaptability accounted for a significant portion of the variance in asthma management behaviors at follow-up ($B = -.37, p < .04, R^2 = .25$)."</p>	<p>"higher levels of adaptability at baseline functioned as a resource factor and were related to more optimal asthma management behaviors at follow-up, after both neighborhood disadvantage and asthma symptoms were held constant in separate regression equations"</p> <p>"higher levels of adaptability appeared to play a protective role in helping to enhance asthma management behaviors when children were faced with higher levels of neighbourhood disadvantage."</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Mitchell et al., 2004)	Asthma symptoms	Adaptability (141 item "Behaviour Assessment System for Children" administered to primary caregivers)	Mean 9.7 yrs	Asthma Management Behaviours (Asthma Behavioural Assessment Questionnaire Primary Caregiver report)	Mean 11 years Approx. 1 yr – post baseline	Hierarchical multiple regression	<p>"children's levels of adaptability accounted for a significant portion of the variance in follow-up asthma management behaviors ($B = .33, p < .05, R^2 = .13$)"</p> <p>"The interaction between baseline asthma symptoms and adaptability did not account for a significant portion of the variance in asthma management behaviors at follow-up."</p>	"higher levels of adaptability at baseline functioned as a resource factor and were related to more optimal asthma management behaviors at follow-up, after both neighborhood disadvantage and asthma symptoms were held constant in separate regression equations"
(Eshbaugh, 2006)	Being a teen mother	Hispanic ethnicity (Demographics)	Baseline (14 months post giving birth): Mean = 17.6 yrs	Depression symptoms (Centre for Epidemiological Studies Depression Scale. Short version)	36 months post giving birth	Hierarchical linear regression	<p>Step 1</p> <p>"While controlling for depression at 14 months, European-American teens were more likely than other teens to be depressed and Hispanic teens were less likely than other teens to be depressed. Because depression at 14 months was used as a covariate, this finding indicates that European-American teen mothers tend to become more depressed between 14 and 36</p>	*Note: study suggests that there are ethnic differences in depression.

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
							<p>months, while Hispanic teens become less depressed.”</p> <p>Result for Hispanics (also included in model = constant, program/control, age, European-American, depression at 14 month)</p> <p>B= -1.68 SE B=.66 B = -10 p<.01</p> <p>Step 2</p> <p>“Hispanic ethnicity remained significant predictors.”</p> <p>Result for Hispanics (also included in the model =constant, program/control, age, European-American, depression at 14 month, mastery, knowledge of CD and parental distress)</p> <p>B= -1.74 SE B=.65 B = -11 p <. 01</p>	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Zhang et al., 2014)	Undergoing an earthquake	Internal locus at control (Internalising scale by Levenson & Miller)	At baseline (3 month post trauma)- Mean age =15.77	Post-traumatic stress symptoms (reduced) (PTSD Check list civilian Chinese version (PCL-C))	14 months post baseline- (i.e. 17 months post trauma)	Multiple linear regression	Internality (b =-.124, Beta = -.080 p<0.01) “The results of the present study showed that locus of control explained a significant amount of variance in PTSD symptoms, above and beyond earthquake exposure” “Conversely, an internal locus of control was a strong protective factor against PTSD symptoms”	*Note: only reporting results for 17 months post trauma 12 independent variables were included in the regression analyses including: injured, classmates died, gender, property loss, parents died, buried, witnessed injury, chance, power others, internality, problem solving, imagining
(Zhang et al., 2014)	Undergoing an earthquake	Problem solving coping (A native 'coping styles scale')	At baseline (3 month post trauma)- Mean age =15.77	Post-traumatic stress symptoms (reduced) (PTSD Check list civilian Chinese version (PCL-C))	14 months post baseline- (i.e. 17 months post trauma)	Multiple linear regression	Problem-solving coping skill (b =-1.760 , Beta = -.097 p < 0.001) “The present study found that problem-solving skill was a negative predictor of PTSD symptoms at 17 months post-earthquake and helped mitigate the severity of PTSD symptoms”	*Note: only reporting results for 17 months post trauma 12 independent variables were included in the regression analyses including: injured, classmates died, gender, property loss, parents died, buried, witnessed injury, chance, power others, internality, problem solving, imagining

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(East et al., 2006)	high-risk environments	Childbearing attitudes	13.7 years	Pregnancy (Self report of pregnancy)	18.6 years	Logistic regression	$b = -1.17$, odds ratio [OR] = 0.31, $p < .05$	Analyses controlled for age and ethnicity "childbearing attitudes had a main effect on teenage pregnancy, such that low childbearing desires and intentions were associated with a reduced likelihood of pregnancy by age 19"
(Salzinger et al., 2011)	Community violence	Competence (Cairns' measure of self-reported competence)	7 th Grade (Time 2)	Internalising problems (Internalising scale of the YSR)	8 th Grade (Time 3)	Hierarchical linear regression	$B = -.13$ $p \leq .01$	"In the domain of individual characteristics, competence, a hypothesized protective factor, was independently and negatively associated with internalizing problems in year 3" *Note: Analyses controlled for gender and year/household dysfunction
(Hess et al., 2002)	Teenage/adol escent first-time mothers	Maternal maturity (Grade level) (Demographics)	Mean age 16.3 years (data collected 1–4 weeks after	Parent satisfaction (Parent sense of competence scale- Parent satisfaction subscale)	Approx 6 month after baseline (data collected 6 months	Multiple regression	Grade level $B = .17$, SE = .06 $B = .22$ $r^2 = .07$ $p < .01$	"Grade level was related to both parenting satisfaction and parental nurturance. Mothers who had completed more schooling were more likely to report higher levels of parenting satisfaction and were more nurturant caregivers in play interactions with their children"

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
			childbirth)		after childbirth)			*Note: Analysis controlled for intervention status
(Hess et al., 2002)	Teenage/adol escent first- time mothers	Maternal maturity (Grade level) (Demographics)	Mean age 16.3 years (data collected 1–4 weeks after childbirth)	Parental nurturance (Modified version of the Parent Child Early Relational Assessment, based on video-taped observations of mothers playing with child)	Approx 6 month after baseline (data collected 6 months after childbirth)	Multiple regression	Grade level $B = .13$, $SE = .05$ $B = .20$ $r^2 = .06$ $p < .01$	“Grade level was related to both parenting satisfaction and parental nurturance. Mothers who had completed more schooling were more likely to report higher levels of parenting satisfaction and were more nurturant caregivers in play interactions with their children” *Note: Analysis controlled for intervention status
(Hess et al., 2002)	Teenage/adol escent first- time mothers	Self-esteem (Rosenberg Self-Esteem scale)	Mean age 16.3 years (data collected 1–4 weeks after childbirth)	Parent satisfaction (Parent sense of competence scale- Parent satisfaction subscale)	Approx 6 month after baseline (data collected 6 months after childbirth)	Multiple regression	Maternal self-esteem $B = .46$, $SE = .15$ $B = .24$ $r^2 = .13$ $p < .01$	“Self-esteem was related only to parenting satisfaction, such that mothers with higher levels of self- esteem at baseline felt more satisfied as parents at 6 months.” *Note: Analysis controlled for intervention status

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Cabaj et al., 2014)	Mothers having either demographic or mental health risk	Child – high social competence (Maternal report)	Age 5	Externalising behaviour (National Longitudinal Survey of Children and Youth Child Behavioural Scale)	Age 6–8	Chi square	High social competence at age 5 was associated with child externalising behaviour at age 8 High child social competence and low degree externalising behaviours N = 8 (40%). High child social competence and high degree externalising behaviours N = 2 (6%). P-value = 0.004	*Note: this association was based on very small N's *Note: study reported other protective factors but was unable to determine the timing of measures.
Martinez-Torteya et al., 2009)	Domestic violence exposure	Child temperament (Carey Temperament Scales)	Average over age 2, 3 and 4	Positive adaptation (Internalising and Externalising in the Child Behaviour Checklist)	Average over age 2, 3 and 4	Logistic regression	Easy child temperament reduced odds of being non-resilient (i.e. exposed to domestic violence and had negative adaptation) as compared to be resilient (i.e. exposed to domestic violence and positive adaptation) (OR = .39, 95% CI = .26, .58, d = .52) Easy child temperament reduced	“Children who exhibited higher levels of easy temperament (OR = .39, 95% CI = .26, .58, d = .52) and whose mothers reported less depression (OR = 1.14, 95% CI = 1.03, 1.25, d = .07) were more likely to be classified resilient than nonresilient.” “Children in the vulnerable group experienced fewer stressful life events (OR = 1.26, 95% CI = 1.03, 1.55, d = .13), had more difficult

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
							<p>odds of being vulnerable (i.e. not exposed to domestic violence and had negative adaptation) as compared to be resilient (i.e. exposed to domestic violence and positive adaptation)</p> <p>(OR = .37, 95% CI = .21, .65, d = .55)</p> <p>Logistic regression conducted only with those exposed to domestic violence:</p> <p>“Maternal depression (OR = 1.14, 95% CI = 1.02, 1.28, d = .07) and easy temperament (OR = 0.46, 95% CI = 0.31, 0.68, d = .43) emerged again as significant predictors of resilience, with small to medium effect sizes”</p>	<p>temperaments (OR = .37, 95% CI = .21, .65, d = .55), and had mothers with higher levels of depression (OR = 1.26, 95% CI = 1.10, 1.44, d = .13). Importantly, this group of children was not exposed to DV, but did encounter other environmental risks or vulnerabilities, such as more depressed mothers and more difficult temperaments.”</p> <p>*Note: This study examined a protective factor (as an average score across age 2, 3 and 4) and resilience outcome (as an average score across age 2, 3 and 4)</p>
(Rhule et al., 2006)	Adolescent mother	Lower levels of externalising behaviour	Infancy/ preschool	Positive behavioural adjustment	Grade 3	Logistic regression	OR = 1.61 (1.16–2.22) p = .005	“Significant predictors of positive behavioral adjustment included lower levels of child externalizing and maternal depressive symptoms” ($\chi^2(2) = 17.18, p < .001$).”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
		(CBCL – mother reported)		(Child behaviour checklist – (mother rated) and TRF (teacher rated))				
(Rhule et al., 2006)	Adolescent mother	Greater language development (Test of Auditory Comprehension of Language-Revised)	Infancy/preschool	Positive Academic adjustment (Teacher report + test data)	Grade 3	Logistic regression	OR = 2.33 (1.50–3.63) $p = <.001$	“Greater language development and lower levels of maternal depressive symptoms significantly predicted positive academic adjustment ($\chi^2(2) = 23.30, p < .001$).”
(Rhule et al., 2006)	Adolescent mother	Lower levels of externalising behaviour (CBCL – mother reported)	Infancy/preschool	Positive adjustment at home	Grade 3	Logistic regression	OR = 1.71 (1.24–2.36) $p = .001$	“lower levels of child externalizing and maternal depressive symptoms were the two significant predictors of positive adjustment at home ($\chi^2(2) = 22.34, p < .001$)”
(Rhule et al., 2006)	Adolescent mother	Greater language development (Test of Auditory Comprehension of Language-Revised)	Infancy/preschool	Positive adjustment at school	Grade 3	Logistic regression	OR = 1.41 (1.04–1.92) $p = .031$	“Positive adjustment at school was significantly predicted by greater language development and higher levels of positive parenting ($\chi^2(2) = 10.04, p < .01$)”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Reynolds, 1998)	At risk due to poverty and associated factors	Gender	Grade 3	Social resilience (those who satisfied 2 out of 3 teacher rated classroom-related adjustment indicators were classified socially resilient)	Grade 6	Logistic (nonlinear regression)	Change in rate of resilience vis-à-vis non-resilience = 0.133 p<.01	“On average, the rate of resilience for girls was 13 percentage-points higher than boys”
(Reynolds, 1998)	At risk due to poverty and associated factors	Gender	Grade 3	Scholastic and Social resilience (Composite measure of reading comprehension, maths, ever repeated a year, special education placement, classroom related adjustment)	Grade 6	Logistic (nonlinear regression)	Change in rate of resilience vis-à-vis non-resilience = 0.098 p<.01	
(Reynolds, 1998)	At risk due to poverty and associated factors	Perceived social competence (10 item composite scale – student self-report on their social competence)	Grade 3	Scholastic and Social resilience (Composite measure of reading comprehension, maths, ever repeated a year, special education placement, classroom related adjustment)	Grade 6	Logistic (nonlinear regression)	Change in rate of resilience vis-à-vis non-resilience = 0.014 p<.01	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Leon et al., 2008)	Highly vulnerable youth in the child welfare system	Increased interpersonal and emotional competence	13.2 yrs	Lower non-sexual rumination (Non-sexual rumination scale)	Mean 1.5 yrs (SD 0.6 yrs post baseline) Range between T1 and T2 = 0.6 - 3.2 yrs	Stepwise regression	“Finally, increased interpersonal and emotional competence predicted lower time 2 non-sexual rumination, controlling for time 1 non-sexual rumination ($\beta = -.16, p < .05$).”	
(Leon et al., 2008)	Highly vulnerable youth in the child welfare system	Male sex	13.2 yrs	Decreased negative effect (Negative affect scale)	Mean 1.5 yrs (SD 0.6 yrs post baseline) Range between T1 and T2 = 0.6 – 3.2 yrs	Stepwise regression	“Controlling for sexual abuse, gender also predicted negative affect, with boys scoring lower than girls on average ($\beta = -.25, p < .01$)”	“A main effect for gender was found in the analysis of negative affect; females were associated with less improvement in negative affect across the two time points, with physical and sexual abuse history held constant.”
(Leon et al., 2008)	Highly vulnerable youth in the child welfare system	Male sex	13.2 yrs	lower non-sexual rumination (Non-sexual rumination scale)	Mean 1.5 yrs (SD 0.6 yrs post baseline) Range between T1 and T2 = 0.6 – 3.2 yrs	Stepwise regression	“Girls exhibited more non-sexual rumination than boys ($\beta = -.17, p < .05$). “	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Hyman et al., 2011)	Homelessness	Being female	16–19	Participating in school	2 years post-baseline	Logistic regression	<p>Step 1 (individual level variables) Beta = 1.41, $p < 0.05$ OR 4.09 (95% CI [1.40, 12.21])</p> <p>“Amongst individual level variables, sex...emerged as [a] significant predictor of educational resilience using Time 1 predictors”</p> <p>Step 2 (social level variables) Beta = 1.37, $p < 0.05$ OR 3.94 (95% CI [1.28, 12.15])</p> <p>Step 3 (full model) Beta = 1.46, $p < 0.05$ OR = 4.32 (95% CI [1.34, 13.98])</p> <p>“The odds ratio for sex in the full model indicates that female youth are more likely to be participating in school at follow up compared to male youth”</p>	<p>Examined whether homeless male youth are at greater risk of high school completion than homeless female youth</p> <p>Duration of housing at Time 2 was the only other significant variable, but as this data was collected at T2, not T1, it is invalid</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Masten et al., 1999)	Psychosocial stressors (based upon a range of life events and experiences during childhood and adolescence)	IQ	8–12 years	Conduct (parent & child responses to interview questions and teacher ratings of Devereux teacher ratings)	10 years post-baseline	Hierarchical multiple regression	IQ x adversity: $r^2 = 0.02$ ($p < 0.05$) “The interaction of childhood adversity and IQ...added to the prediction of adolescent conduct...Over time, the conduct gap widened between low- and high-IQ adolescents experiencing high adversity.”	Examined the link between conduct at adolescence (10 years post-baseline) and a set of predictors including adversity and two potential compensatory or protective variables: IQ and parenting quality
(Brookmeyer et al., 2005)	Witnessed community violence	Social cognitions	11–15 years	Committing acts of violence* (Adolescents who witness violence but do not perpetrate violence are viewed as resilient in this study because “despite exposure to a high-risk environment, they have achieved adaptive success”)	1 year post baseline	Hierarchical regression analysis	Social cognitions x gender = Beta = 0.08, $p < 0.05$ “For females, the Witnessing x social cognitions interaction was statistically significant...but not significant for males”	Investigating how resilience factors of social cognitions (protective factor) may protect adolescents exposed to violence (adversity) from committing violence (measure of resiliency) The witness x social cognitions did not reach significance – only when gender is added that it reaches significance

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Daigneault et al., 2007)	Childhood sexual abuse	Empowerment (23-item scale evaluating sense of empowerment – five subscales: optimism, self-efficacy, power/powerlessness and justified anger)	11–17 years	Global resilience (a composite resilience scale score combining a clinician-scored measure (Multidimensional Trauma, Recovery and Resiliency Scale), and a youth self-report and profile scale)	5 months post baseline (average, range = 49 days – 343 days)	Multivariate regression	Compares those who were resilient at T1 <i>and</i> T2 to the 3 other groups: not resilient at T1 or T2 or both: Standardised B = 6.3 OR = 1.1 (1.0-1.2), p < 0.05 “When comparing adolescents whose profile was considered resilient at T1 and T2 and those whose profile was not resilient, results reveal that adolescents with resilient profiles throughout the study were those exhibiting more interpersonal trust and a greater sense of empowerment”	
(Daigneault et al., 2007)	Childhood sexual abuse	Mistrust	11–17 years	Global resilience (a composite resilience scale score combining a clinician-scored measure (Multidimensional Trauma, Recovery and Resiliency Scale), and a	5 months post baseline (average, range = 49 days – 343 days)	Multivariate regression	Standardized B = 5.9 OR = 0.8 (95% CI [0.6-0.9]) “When comparing adolescents whose profile was considered resilient at T1 and T2 and those whose profile was not resilient, results reveal that adolescents	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				youth self-report and profile scale)			with resilient profiles throughout the study were those exhibiting more interpersonal trust and a greater sense of empowerment”	
(Pargas et al., 2010)	Offspring of mothers who had histories of depression during offspring’s early childhood (first five years)	IQ	15 years	All of the following: no current Axis 1 diagnosis* (excluding specific phobia), no clinically significant internalising problems, no current academic or work difficulties, no current romantic relationship functioning difficulties, and no history of early onset/recurrent depression or dysthymia	20 years	Logistic regression analysis	OR = 1.11 (95% CI [1.03-1.19]), p < 0.01 “IQ...acted as a protective factor for children of depressed mothers”	
(Rennie & Dolan, 2010)	Incarceration	Resilient personality traits	16.14 (mean)	No re-offending (no new record on the police database)	12 months post-baseline	Logistic regression	Exponent of B = 2.86, p = 0.05 (95%CI [1.00, 8.26]) “Of the individual factors, only having a positive and resilient personality is predictive [of not re-offending]”	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Qouta et al., 2001)	Palestinian Intifada	Mental flexibility (Measured by 2 tasks developed by Hofni (1980) and based on the cat-dog test by Brunswik (1949))	10–12 years	Psychological adjustment – Emotional disorders (Ontario Child Health Scale (Child Mother and Teacher report))	13–15 yrs 3 yrs post baseline	Multiple regression	Mental flexibility X Trauma Multi-informant, $Beta = .24, t = 2.21, p < .05$ Child-reported, $Beta = .24, t = 2.11, p < .04$	Mental flexibility moderated the negative effect of traumatic events on emotional disorders “Results in Table 2 show that the significant Trauma X Flexibility interaction effect was found only on emotional disorders at follow-up. Traumatic experiences were associated with increased emotional disorders only among children with rigid mental set (interaction for multi-informant score, $Beta = .24, t = 2.21, p < .05$; and for child-reported score, $Beta = .24, t = 2.11, p < .04$). Flexibility thus served resiliency dynamics once military violence was over by attenuating the impact of trauma on emotional disorders...” “The main effect hypothesis that children with a Flexible mental set would enjoy better psychological adjustment was rejected.” “Mental Flexibility moderated the negative impact of traumatic

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								events on psychological wellbeing only when hostilities had calmed down, but not in the midst of violence.”
(Vanderbilt-Adriance and Shaw, 2008)	Low SES	Child IQ (4 sub-test short form of the WPPSI-R)	Age 5.5 years	Positive social adjustment as measured by: Both low levels of anti-social behaviour and high levels of social skills (Combined scores using an adopted version of the self-report anti-social behaviour questionnaire and social skills rating system completed by mothers and teachers)	11 and 12 yrs	Point biserial correlations	Child IQ ($r=0.17, p<0.05$),	child IQ associated with later positive social adjustment *Note: Child IQ did not remain significant for the multiple regression
(Haefffel & Vargas, 2011)	Negative cognitive style & high proportion of stressful life events	Enhancing cognitive style (Cognitive Style Questionnaire)	Mean age = 19.32 years	Depressive symptoms reduced – display depressive symptoms similar to those without a negative cognitive style	4 weeks post baseline	Hierarchical multiple regression analysis	$b = 1.60, t = 2.34, p = 0.02$	“As predicted, the three-way interaction among negative cognitive style, stressful life events, and enhancing cognitive style was significant, $b = 1.60, t = 2.34, p = 0.02$.” “Moreover, there was a significant three-way interaction among negative cognitive style, enhancing

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				(Beck Depression Inventory)				<p>cognitive style, and positive life events, $b = 0.57$, $t = 2.46$, $p = 0.02$"</p> <p>"Individuals with a negative cognitive style who experienced a high proportion of stressful events typically experienced the greatest level of depressive symptoms. However, if these individuals also had an enhancing cognitive style (Fig. 1) or a high level of positive events (Fig. 2), then they were buffered from depressive symptoms and displayed levels of depressive symptoms similar to those without a negative cognitive style"</p> <p>"Finally, none of the interaction patterns supported our hypothesis that those with low levels of both cognitive styles would exhibit the lowest level of depressive symptoms. Rather, participants with a low negative cognitive style combined with a high enhancing cognitive style and/or high levels of positive life events were the most resilient to depression."</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								<p>ethnicity, gender, locus of control, future expectations, and academic curriculum – were entered together into one simultaneous regression. (None of the behavioral factors were entered here because none were found to significantly predict academic resilience.)</p> <p>Among the demographic factors, ethnicity and gender but not SES were shown to predict academic resilience above and beyond all the significant psychological and school environmental variables”</p> <p>“The predictive relationship between SES and academic resilience was partially explained by having a high internal locus of control in 8th grade, $t = 18.145$, $p < .001$, high academic aspirations in 8th grade, $t = 8.207$, $p < .001$, and 12th grade transcripts indicating completion of an academic curriculum, $t = 10.340$, $p < .001$”</p>
(Cappella & Weinstein, 2001)	Academic risk= low reading proficiency on entry to high school	Ethnicity: Caucasian (Demographics collected from student or parent surveys)	N/A	Academic resilience (Above or average proficiency level reading achievement test scores by Grade 12)	12 th Grade	Simultaneous multiple regression	<p>SE = .014 B = -0.087 t = -2.919 p <.01</p> <p>SE = .016 B = 0.098 t = 2.989 p <.01</p>	“Students from higher income backgrounds were more likely to be resilient, as were students from the majority ethnic group (Caucasian) and those who were

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
	age grade 8							females” “The significant predictors from across all domains of analysis – SES, ethnicity, gender, locus of control, future expectations, and academic curriculum – were entered together into one simultaneous regression. (None of the behavioral factors were entered here because none were found to significantly predict academic resilience.) Among the demographic factors, ethnicity and gender but not SES were shown to predict academic resilience above and beyond all the significant psychological and school environmental variables”
(Cappella & Weinstein, 2001)	Academic risk= low reading proficiency on entry to high school age grade 8	Gender: Female (Demographics collected from student or parent surveys)	N/A	Academic resilience (Above or average proficiency level reading achievement test scores by Grade 12)	12 th Grade	Simultaneous multiple regression	SE = .020 B = 0.074 t = 2.648 p <.01 SE = .023 B = 0.084 t = 2.776 p <.01	“Students from higher income backgrounds were more likely to be resilient, as were students from the majority ethnic group (Caucasian) and those who were females” “The significant predictors from across all domains of analysis— SES, ethnicity, gender, locus of

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								control, future expectations, and academic curriculum—were entered together into one simultaneous regression. (None of the behavioral factors were entered here because none were found to significantly predict academic resilience.) Among the demographic factors, ethnicity and gender but not SES were shown to predict academic resilience above and beyond all the significant psychological and school environmental variables”
(Hammack et al., 2004)	Exposure to community violence – witnessing community violence	Perceived social support (adaptation of the Survey of Children’s Social Support (Dubow & Ullman, 1989)	Grade 6	Anxiety symptoms (The trait subscale of the State–Trait Anxiety Inventory for Children (Spielberger, Edwards, Montuori, & Lushene, 1973))	Grade 7	Hierarchical multiple regression	Note: for girls Three-way interaction: Sex × Witnessing × Social Support $F(10, 149) = 9.52, p < .001, R^2 = .39$	“A significant Sex × Witnessing × Social Support interaction revealed social support as a promotive–reactive factor over time for girls.” “Girls who reported high social support and low witnessing at Time 1 reported less change in anxiety at Time 2, but girls with high social support who witnessed more violence at Time 1 reported greater increases in anxiety at Time 2, $F(10, 149) = 9.52, p < .001, R^2 = .39.$ ”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								<p>“The longitudinal data from boys demonstrated no significant interaction for anxiety.”</p> <p>*Note: have just reported longitudinal association</p>
(Hammack et al., 2004)	Exposure to community violence – victims of community violence	Perceived social support (adaptation of the Survey of Children’s Social Support (Dubow & Ullman, 1989))	Grade 6	Anxiety symptoms (The trait subscale of the State–Trait Anxiety Inventory for Children (Spielberger, Edwards, Montuori, & Lushene, 1973))	Grade 7	Hierarchical multiple regression	<p>Note: for girls</p> <p>Sex × Victimization × Social Support</p> <p>$F(10, 149) = 9.28$, $p < .001$, $R^2 = .38$</p>	<p>“The same relation emerged for victimization, $F(10, 149) = 9.28$, $p < .001$, $R^2 = .38$, revealing that social support represented a promotive–reactive factor for girls in terms of both primary and secondary violence exposure.”</p> <p>“The longitudinal data from boys demonstrated no significant interaction for anxiety.”</p> <p>*Note: have just reported longitudinal association</p>
(Causadias et al., 2012)	At-risk sample – low income, single	Elementary ego-resiliency	Elementary school	Adaptive functioning – Global adjustment	At age 19 and at age 26	Multiple regression	<p>Age 19 =</p> <p>$B = 1.77$ [95% CI 1.19, 2.35], $p < .0001$</p>	<p>“...elementary ego resiliency predicted more adaptive functioning at age 19 and 26”</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
	parenthood, low maternal education	(California Child Q-Set; (CCQ; Block & Block, 1969/1980))		(Based on audiotaped interviews about work, social and romantic relationship)			Age 26 = B = 1.66 [95% CI 1.40, 1.91], p<.001	
(Causadias et al., 2012)	At risk sample – low income, single parenthood, low maternal education	Preschool ego-resiliency (California Child Q-Set; (CCQ; Block & Block, 1969/1980))	Preschool school	Fewer internalising problems (Youth Self-Report (YSR; Achenbach, 1991))	Age 16	Linear mixed modelling	B = -2.73, SE B = 1.16 [95% CI 5.00, -0.46] p<.005	“The results from the preschool model indicated that higher preschool ego-resiliency predicted fewer internalizing symptoms at age 16” *Note: Need to interpret the findings in light of the following: “Perhaps the most significant contributions of this study are the evidence that ego-resiliency in childhood is a promotive factor for the development of global adjustment in late adolescence and adulthood, as well as risk factors for the development of behavior problems from adolescence into adulthood”
(Causadias et al., 2012)	At-risk sample – low income, single	Elementary ego-resiliency	Elementary school	Lower externalising problems	Age 16	Linear mixed modelling	B = -2.72, SE B = 1.32 [95% CI -5.31, -0.14] p<.005	“The results from the elementary model indicated a negative effect for ego-resiliency on age 16 externalizing symptoms. As shown

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
	parenthood, low maternal education	(California Child Q-Set; (CCQ; Block & Block, 1969/1980))		(Youth Self-Report (YSR; Achenbach, 1991))				<p>in Figure 2, higher ego-resiliency predicted lower externalizing symptoms”</p> <p>*Note: Need to interpret the findings in light of the following: “Perhaps the most significant contributions of this study are the evidence that ego-resiliency in childhood is a promotive factor for the development of global adjustment in late adolescence and adulthood, as well as risk factors for the development of behavior problems from adolescence into adulthood”</p>
(Flouri et al., 2014)	Family socio- economic disadvantage (SED)	Self-regulation ((Child Social Behaviour Questionnaire (CSBQ), based on the Adaptive Social Behavior Inventory (Hogan et al. 1992))	Data collected at ages 3, 5, 7, but difficult to determine which wave (age) was used in the analysis	Internalising problem trajectories (Strengths and Difficulties Questionnaire (SDQ; Goodman 1997).	Trajectori es modelled based on data at age 3, 5, and 7 years	Multivariate response growth curve modelling	Self-regulation x SE: Coeff = -0.332 SE = 0.172 [95 % CI= -0.67,0.01], N/S	<p>“The interactions included in Model 4 (Table 5) indicated that self-regulation moderated the effect of SED on linear change in both problems.”</p> <p>“The association of poverty and both emotional and behavioural adjustment was dampened for children with high self-regulation.”</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
							<p>Self-regulation x SED x age: Coeff = -0.248, SE = 0.070 [95 % CI = -0.39,-0.11], P<.05</p>	<p>“For internalising problems (Fig. 1), the highest scores, as expected, were for the poor child (high SED throughout) with low-self regulation, although her fitted scores were within the normal range of difficulties (under 4 out of 20)”</p> <p>“The gap between the high-SED child with and without self-regulation widened over time, going from a difference of about three-fourths to two points. The line for the poor child with high self-regulation dropped over time to meet the line for a child with high self-regulation not in poverty, around age 6. On the other hand, the advantaged child (no SED) with high self-regulation had a trajectory not so far below that of an advantaged child with low self-regulation, at a roughly constant gap of around one point across time. Therefore, self-regulation appears to differentiate poor children’s internalising problems more than those of non-poor children.”</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Flouri et al., 2014)	Family socio-economic disadvantage (SED)	Self-regulation (Child Social Behaviour Questionnaire (CSBQ), based on the Adaptive Social Behavior Inventory (Hogan et al. 1992))	Data collected at ages 3, 5, 7, however difficult to determine which wave (age) was used in the analysis	Externalising problem trajectories (Strengths and Difficulties Questionnaire (SDQ; Goodman 1997).	Trajectories modelled based on data at age 3, 5, and 7 years	Multivariate response growth curve modelling	<p>Self-regulation x SE: Coeff = -0.395 SE = 0.212 [95 % CI = -0.81, 0.02] N/S</p> <p>Self-regulation x SED x age: Coeff = -0.254 SE = 0.089 [95 % CI = -0.43, -0.08] P < .05</p>	<p>“The interactions included in Model 4 (Table 5) indicated that self-regulation moderated the effect of SED on linear change in both problems.”</p> <p>“The association of poverty and both emotional and behavioural adjustment was dampened for children with high self-regulation.”</p> <p>“As for externalising problems (Fig. 2), the high-risk group (high SED/low self-regulation) had a level of problems nearing a score of 9 (out of 20) at age 3, a cutoff¹ for identifying borderline abnormality based on recommended practice (Goodman 1997). The average difference between the two high SED groups also widened, as with internalising problems, but even more substantially to over three points around ages 6 and 7, narrowing the gap between poor and non-poor children with high self-regulation.”</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Flouri et al., 2014)	Family socio-economic disadvantage (SED)	Verbal cognitive ability (measures from the second edition of the British Ability Scales (BASII; Elliott et al. 1996))	Data collected at ages 3, 5, 7, however difficult to determine which wave (age) was used in the analysis	Internalising problem trajectories (Strengths and Difficulties Questionnaire (SDQ; Goodman 1997).	Trajectories modelled based on data at age 3, 5, and 7 years	Multivariate response growth curve modelling	Verbal ability x SED Coeff = -0.200 SE = (0.066) [95 % CI = -0.33,-0.07] P<.05	“Verbal cognitive ability moderated the effect of SED on the level of internalising problems.” “The significant interaction of SED and verbal cognitive ability (not plotted) showed that children in poverty who have high ability have fewer internalising problems at a given point in the trajectory than children in poverty with low ability. Among the non-poor, ability seemed to differentiate children much less.”
(Dubow et al., 2001)	*Difficult to extract data Schools were located in county with second highest adolescent pregnancy rate in the state, and 2/3+ of students	Problem-solving efficacy (measure of perceived problem-solving efficacy (Schmidt & Dubow, 1998))	Unclear (data collected from Grade 6, Grade 7 and Grade 8 students). Time 1 – September	Positive future expectations (Revised version of the Wyman et al. (1993) future expectations scale)	Unclear (data collected from Grade 6, Grade 7 and Grade 8 students). Time 2 – June	Hierarchical regression	Beta = .31, p <.01	“students with initially higher levels of perceived problem-solving efficacy showed increases over time in positive expectations for the Future”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
	qualified for free and reduced lunch rates							
(Betancourt et al., 2010)	Being a child soldier; being raped, killing or injuring people during war	Social support	15.1 – 21.8	Adaptive/prosocial behaviours (Oxford Measure of Psychological Adjustment)	21.8	Multilevel linear growth modelling	“Social support ($b=0.93$, $p=0.006$) was associated with increased prosocial/adaptive behaviors over time.”	
(Rew et al., 2012)	Being Hispanic / low SES / high levels of stress	Temperament (coping) (measured by School-Age Temperament Inventory (SATI))	10.4	Scholastic competence	15.0	Multiple regression	$B=0.163$ $SE(B)=0.037$ $B = 0.147$ $p=0.000$	
(Rew et al., 2012)	Being Hispanic / low SES / high levels of stress	Temperament (coping) (measured by School-Age Coping Inventory)	10.4	Social acceptance	15.0	Multiple regression	$B=-0.126$ $SE(B)=0.055$ $B = -0.093$ $p=0.022$	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Rew et al., 2012)	Being Hispanic / low SES / high levels of stress	Temperament (persistence at tasks) – (measured by School-Age Temperament Inventory (SATI))	10.4	Scholastic competence	15.0	Multiple regression	B=0.163 SE(B)=0.037 B =0.147 p=0.000	
(Rew et al., 2012)	Being Hispanic / low SES / high levels of stress	Temperament (persistence at tasks) – (measured by School-Age Temperament Inventory (SATI))	10.4	Behavioural conduct	15.0	Multiple regression	B=0.135 SE(B)=0.035 B =0.157 p=0.000	
(Rew et al., 2012)	Being Hispanic / low SES / high levels of stress	Temperament (persistence at tasks) – (measured by School-Age Temperament Inventory (SATI))	10.4	Social acceptance	15.0	Multiple regression	B=0.062 SE(B)=0.028 B =0.090 p=0.027	
(Rew et al., 2012)	Being Hispanic / low SES / high	Temperament (persistence at tasks) –	10.4	Global self-worth	15.0	Multiple regression	B=0.085 SE(B)=0.031	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
	levels of stress	(measured by School-Age Temperament Inventory (SATI))					$B = 0.109$ $p = 0.007$	
(McVie, 2014)	Bullying perpetration (risk factor)	Being female	12	Participation in violence (self-reported – participants asked whether they had committed any of five acts of violence)* * Not participating in violence is the resilient outcome – but the results are presented in the table according to predictability of participation in violence at age 17 – hence the negative effect sizes	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on violence at age 17, controlling for being female: $B = -0.81, SE = 0.13, p < 0.001$ “The results...indicated that being female increased resilience to violence at age 17”	
(McVie, 2014)	Bullying perpetration (risk factor)	Positive / prosocial attitudes (teacher rated – shortened version of the Strengths and Difficulties Questionnaire)	13	Participation in violence (self-reported – participants asked whether they had committed any of five acts of violence)*	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on violence at age 17, controlling for positive/prosocial attitudes:	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				* Not participating in violence is the resilient outcome – but the results are presented in the table according to predictability of participation in violence at age 17 – hence the negative effect sizes			B = -0.41, SE = 0.14, p < 0.01 “Those who reported by teachers to have positive attitudes and prosocial attitudes at age 13 were also more resilient to later violence”	
(McVie, 2014)	Bullying perpetration (risk factor)	Low impulsivity (modified version of the Eysenck Impulsivity Scale)	Unclear, but measured at one or multiple times points when participants were aged 13–16	Participation in violence (self-reported – participants asked whether they had committed any of five acts of violence)* * Not participating in violence is the resilient outcome – but the results are presented in the table according to predictability of participation in violence at age 17 – hence the negative effect sizes	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on violence at age 17, controlling for low impulsivity: B = -0.63, SE = 0.17, p < 0.001 “The results...indicated that...having a low score on the measures of impulsivity and social alienation [increased resilience to violence at age 17]”	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(McVie, 2014)	Bullying perpetration (risk factor)	Low social alienation (modified version of the Multidimensional Personality Questionnaire)	Unclear, but measured at one or multiple times points when participant s were aged 13– 16	Participation in violence (self-reported – participants asked whether they had committed any of five acts of violence)* * Not participating in violence is the resilient outcome – but the results are presented in the table according to predictability of participation in violence at age 17 – hence the negative effect sizes	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on violence at age 17, controlling for low social alienation: B = -0.49, SE = 0.17, p < 0.01 “The results...indicated that...having a low score on the measures of impulsivity and social alienation [increased resilience to violence at age 17]”	
(McVie, 2014)	High-level bullying perpetration (participants involved in the most extreme levels of bullying) (risk factor)	Low social alienation (modified version of the Multidimensional Personality Questionnaire)	Unclear, but measured at one or multiple times points when participant s were aged 13– 16	Participation in violence (self-reported – participants asked whether they had committed any of five acts of violence)* * Not participating in violence is the resilient outcome – but the results are presented in the table according to	17	Logistic regression	Interaction between being a high level bully and social alienation: B = -0.91, SE = 0.41, p < 0.05 “A negative interaction was found between being a high bully at age 13–16 and low social alienation. The moderate effect size of this interaction indicates that the impact of being a bully in	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				predictability of participation in violence at age 17 – hence the negative effect sizes			early life on later violence is moderated among those who have low social alienation, which means that strong social engagement and friendship networks could be a protective factor against later violence”	
(McVie, 2014)	Bullying victimisation (a bully victim at age 13–16)	Being male	12	Psychological distress (reduced version of the Hospital Anxiety and Depression Scale (HADS))	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on psychological distress at age 17, controlling for being female: B = 0.55, SE =0.11, p < 0.001 “Being male was predictive against psychological distress in late adolescence”	
(McVie, 2014)	Bullying victimisation (a bully victim at age 13–16)	Low social alienation (modified version of the Multidimensional Personality Questionnaire)	12	Psychological distress (reduced version of the Hospital Anxiety and Depression Scale (HADS))*	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on psychological distress at age 17, controlling for social alienation: B = -0.78, SE =0.13, p < 0.001	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				* Low levels of psychological distress is the resilient outcome – but the results are presented in the table according to predictability of psychological distress at age 17 – hence the negative effect sizes			“Those with high self-esteem and low social alienation were... significantly less likely to experience later anxiety and depression”	
(McVie, 2014)	Bullying victimisation (a bully victim at age 13–16)	High self-esteem (modified version of the Rosenberg Self-Esteem Scale)	12	Psychological distress (reduced version of the Hospital Anxiety and Depression Scale (HADS))* * Low levels of psychological distress is the resilient outcome – but the results are presented in the table according to predictability of psychological distress at age 17 – hence the negative effect sizes	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on psychological distress at age 17, controlling for high self-esteem: B = -0.77, SE = 0.13, p < 0.001 “Those with high self-esteem and low social alienation were... significantly less likely to experience later anxiety and depression”	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from (Olweus 1993)	Self-esteem (Modified Rosenberg Self-esteem scale)	12 yrs	Emotional resilience (Bowes et al (2010) Regression depression scores at age 14 yrs on levels of bullying victim)	14 yrs	Hierarchical regression	Beta = 0.17 p<0.001	
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from (Olweus 1993)	Male sex (Dichotomous)	12 yrs	Emotional resilience (Bowes et al (2010) Regression depression scores at age 14 yrs on levels of bullying victim)	14 yrs	Hierarchical regression	Beta = 0.21 p< 0.001	
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from (Olweus 1993)	Female (Dichotomous) *Note: But reported as being negatively correlated with being Male	12 yrs	Behavioural resilience (Similar methodology to emotional resilience regressing delinquency scores at age 14 yrs on levels of bullying victimisation)	14 yrs	Hierarchical regression	Result for being Male # Beta – 0.14 p<0.001	“Being female ($B = -.14$, $p < .001$) and having high self-esteem ($B = .08$, $p < .001$) significantly predicted behavioral resilience to bullying victimization.”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from (Olweus 1993)	Self-esteem (Modified Rosenberg Self-esteem scale)	12 years	Behavioural resilience (Similar methodology to emotional resilience regressing delinquency scores at age 14 yrs on levels of bullying victimisation)	14 yrs	Hierarchical regression	Beta 0.08 p<0.001	

Appendix 5: Protective factors – Family factors

See Appendix 4 for a description of the information presented in the table below.

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(East et al., 2006)	Family risk	Protective parenting	13.7 years	Pregnancy (Self-report of pregnancy)	18.6 years	Logistic regression	$b = -1.16$, $OR = 0.33$, $p < .05$	Analyses controlled for age and ethnicity “Protective parenting buffered the relation between family risks and teenage pregnancy” “80% of girls who had low protective parenting and many cumulative family risks became pregnant, whereas 42% of girls who received protective parenting in the context of multiple family risks became pregnant. Protective parenting appears to enact little benefit under conditions of low family risk, with 20% of girls who had protective parenting and 18% of girls who had low protective parenting experiencing a pregnancy when exposed to few family risks.”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(East et al., 2006)	Peer risk	Protective parenting	13.7 years	Pregnancy (Self-report of pregnancy)	18.6 years	Logistic regression	$b = -1.72$, $OR = 0.18$, $p < .01$	Analyses controlled for age and ethnicity “protective parenting buffered the relation between peer risks and teenage pregnancy” “protective parenting helped maintain pregnancy rates even in the presence of high peer risk, with 32% of girls who had high peer risks and 32% of girls who had low peer risks becoming pregnant. In contrast, 77% of girls who received low protective parenting and who were exposed to multiple peer risks experienced a pregnancy. Twenty-three percent of girls who received low protective parenting and who had low peer risks had pregnancy.”
(Salzinger et al., 2011)	Exposure to violence	Attachment to parents (Armsden and Greenberg’s (1987) Inventory of parent and peer attachment)	12–15 years*	Externalising problems (Externalizing scale of the YSR)	13–16 (third year of middle school)	Hierarchical linear regression	$B = -.12$ $p \leq .01$	“Attachment to parents decreased risk for externalizing problems” “No moderation of the relationship between year 2 community violence exposure and year 3 externalizing behavior was found

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								<p>for any of the hypothesized risk/protective factors”</p> <p>Analyses controlled for gender and year/household dysfunction</p> <p>* Data was first collected when participants were 11–14 years old but exposure to violence was only measured at the 2nd time point (i.e. 1 year after the first data collection)</p>
(Salzinger et al., 2011)	Exposure to violence	Attachment to parents (Armsden and Greenberg’s (1987) Inventory of parent peer attachment)	12–15 years*	Internalising problems (Internalising scale of the YSR)	13–16 (third year of middle school)	Hierarchical linear regression	<p>$B = -.13 \ p \leq .01$</p> <p>Community violence × Parent attachment, $B = -.11 \ p \leq .01$</p>	<p>* Data was first collected when participants were 11–14 years old but exposure to violence was only measured at the 2nd time point (i.e. 1 year after the first data collection)</p> <p>“Moderating effects of attachment to parents and attachment to friends were found on the relation between community violence in year 2 and internalizing problems in year 3.”</p> <p>“attachment to parents was <i>less</i> protective against internalizing</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								<p>problem outcome under conditions of high than under conditions of low community violence exposure”</p> <p>Analyses controlled for gender and year/household dysfunction</p>
(Hess et al., 2002)	Teenage/adol escent first- time mothers	<p>Mother–grandmother relationship – individuation</p> <p>(Observation using The Scale of Intergenerational Relationship Quality)</p>	<p>Mean age 16.3 years</p> <p>(data collected 1–4 weeks after childbirth)</p>	<p>Parental Nurturance</p> <p>(Modified version of the Parent Child Early Relational Assessment, based on video-taped observations of mothers playing with child)</p>	<p>Approx. 6 months after baseline</p> <p>(data collected 6 months after childbirth)</p>	Multiple regression	<p>Mother–grandmother relationship- individuation</p> <p>$B = .09, SE = .02 B = .29 r^2 = .16$ $p < .001$</p>	<p>“Two aspects of the mother-grandmother relationship measured with the SIRQ – namely, individuation and positive affect – were related to parental nurturance.”</p> <p>“Mothers who displayed a more balanced, autonomous relationship and were positive and animated in interactions with their mothers during the baseline videotaped observation were more nurturant with their infants during a play observation at six months”</p> <p>Analysis controlled for intervention status</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Hess et al., 2002)	Teenage/adol escent first- time mothers	Mother–grandmother relationship – Positive affect (Observation using The Scale of Intergenerational Relationship Quality)	Mean age 16.3 years (data collected 1–4 weeks after childbirth)	Parental Nurturance (Modified version of the Parent Child Early Relational Assessment, based on video-taped observations of mothers playing with child)	Approx. 6 months after baseline (data collected 6 months after childbirth)	Multiple regression	Mother-grandmother relationship- positive affect $B = .05, SE = .02 B = .18 r^2 = .19$ $p < .05$	“Two aspects of the mother- grandmother relationship measured with the SIRQ – namely, individuation and positive affect – were related to parental nurturance.” “Mothers who displayed a more balanced, autonomous relationship and were positive and animated in interactions with their mothers during the baseline videotaped observation were more nurturant with their infants during a play observation at six months” *Note: Analysis controlled for intervention status
(Rhule et al., 2006)	Adolescent mother	Lower levels of maternal depressive symptoms (Beck Depression Inventory)	Infancy/ preschool	Positive behavioural adjustment (Child behaviour checklist – (mother rated) and TRF (teacher rated)	Grade 3	Logistic regression	OR = 1.32 (1.04–1.69) $p = .025$	“Significant predictors of positive behavioral adjustment included lower levels of child externalizing and maternal depressive symptoms” ($\chi^2(2) = 17.18, p <$.001).

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Rhule et al., 2006)	Adolescent mother	Secure attachment (The Strange Situation observational measures)	Infancy	Positive social adjustment (Social Competence Scale – parent report; Walker-McConnell Scale of Social Competence and School Adjustment – teacher report)	Grade 3	Logistic regression	OR = 2.27 (.99–5.18), $p = .052$	“For positive social adjustment, secure attachment at infancy was a marginally significant predictor; although the model including attachment was statistically significant ($\chi^2(1) = 3.87, p < .05$), the odds ratio for attachment was marginally significant ($p = .052$)”
(Rhule et al., 2006)	Adolescent mother	Lower levels of maternal depressive symptoms (Beck Depression Inventory)	Infancy /preschool	Positive academic adjustment (Teacher report on TFR and academic test data using the Woodcock-Johnson Test of Achievement – Revised)	Grade 3	Logistic regression	OR = 1.28 (1.01–1.63) $p = .041$	“Greater language development and lower levels of maternal depressive symptoms significantly predicted positive academic adjustment ($\chi^2(2) = 23.30, p < .001$).”
(Rhule et al., 2006)	Adolescent mother	Lower levels of maternal depressive symptoms (Beck Depression Inventory)	Infancy/ preschool	Positive adjustment at home	Grade 3	Logistic regression	OR = 1.38 (1.07–1.78) $p = .014$	“lower levels of child externalizing and maternal depressive symptoms were the two significant predictors of positive adjustment at home ($\chi^2(2) = 22.34, p < .001$)”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Rhule et al., 2006)	Adolescent mother	Positive parenting (composite derived from several measures)	Infancy/ preschool	Positive adjustment at school	Grade 3	Logistic regression	OR = 1.70 (1.04–2.80) p = 0.035	“Positive adjustment at school was significantly predicted by greater language development and higher levels of positive parenting ($\chi^2(2) = 10.04, p < .01$)”
(Tiet et al., 2010)	High-risk neighbourhood	Bonding to family (11-item measure derived from Lagrange and White (1985))	T1. 11, 13 and 15 year olds	Adjustment (academic performance, self-esteem, psychosocial functioning) (Academic performance (self-report of grades in school), self-esteem, (self-esteem scale by Rosenberg 1965), psychosocial functioning (parent/guardian's response to 6 subscales at Child Behaviour Checklist)	T2. 12 months post baseline	Path analysis	Analysis on full sample: Bivariate correlations- Unstandardized coefficients = .08, p<.01 Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). Higher bonding to family Unstandardized coefficients = .07, p<.05	
(Tiet et al., 2010)	High-risk neighbourhood	Parental monitoring (Measure developed by Patterson and	T1. 11, 13 and 15 year olds	Adjustment (academic performance, self-esteem, psychosocial functioning)	T2. 12 months post baseline	Path analysis	Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). Higher levels of parental	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
		colleagues (Patterson et al. 1982)		(Academic performance (self-report of grades in school), self esteem, (self-esteem scale by Rosenberg 1965), psychosocial functioning (parent/guardian's response to 6 sub-scales at Child Behaviour Checklist))			monitoring Unstandardised coefficients = .11, p<.001 Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). When resilience at time 1 was included in the model More parental monitoring: Unstandardised coefficients = .08, p<.05	
(Tiet et al., 2010)	High-risk neighbourhood	Parental monitoring (Measure developed by Patterson and colleagues (Patterson et al. 1982))	T1. 11, 13 and 15 year olds	Low levels of antisocial behaviour (Absence of or low levels of gang involvement – self-report; Delinquency-Self Report Delinquency (SRD) measure); Drug use – Self Drug Use Inventory)	T2. 12 months post baseline	Path analysis	Analysis on full sample: Bivariate correlations- Unstandardised coefficients = .06 p<.05 When resilience at time 1 was included in the model, lower levels of parental monitoring: Unstandardised coefficients = .04, p<.05	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Tiet et al., 2010)	High-risk neighbourhood	Lower levels of parental discord (Conflict Tactics Scale)	T1. 11, 13 and 15 year olds	Adjustment (academic performance, self-esteem, psychosocial functioning) (Academic performance (self-report of grades in school), self esteem, (self-esteem scale by Rosenberg 1965), psychosocial functioning (parent/guardian's response to 6 sub-scales at Child Behaviour Checklist))	T2. 12 months post baseline	Path analysis	Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). Lower level of parental discord Unstandardised coefficients = -.08, p<.001 Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). When resilience at time 1 was included in the model Lower levels of parent discord: Unstandardised coefficients = -.07, p<.001	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Tiet et al., 2010)	High-risk neighbourhood	Lower levels of parental discord (Conflict Tactics Scale)	T1. 11, 13 and 15 year olds	Low levels of antisocial behaviour (Absence of or low levels of gang involvement – self-report; Delinquency – Self-Report Delinquency (SRD) measure); Drug use – Self Drug Use Inventory)	T2. 12 months post baseline	Path analysis	Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). Lower level of parental discord Unstandardised coefficients = .04, $p < .05$	
(Reynolds, 1998)	At risk due to poverty and associated factors	Parent expectations (Parent report of expectations for children’s educational attainment)	Grade 2 and 4 (exact age unclear)	Social resilience (those who satisfied 2 out of 3 teacher rated classroom-related adjustment indicators were classified socially resilient)	12	Logistic (nonlinear regression)	Change in rate of resilience vis-à-vis non-resilience = 0.023 $p < .01$	“moreover, a four-year change in parent expectations (i.e., from high school graduation to college graduation) was associated with a nice percentage-point change in resilience”
(Reynolds, 1998)	At risk due to poverty and associated factors	Parental expectations (Parent report of expectations for children’s educational attainment)	Grade 2 and 4 (exact age unclear)	Scholastic and Social resilience (Composite measure of reading comprehension, maths,	12	Logistic (nonlinear regression)	Change in rate of resilience vis-à-vis non-resilience = 0.014 $p < .05$	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				grade retention, special education placement, classroom related adjustment)				
(Leon et al., 2008)	Highly vulnerable youth in the child welfare system	Positive parenting practices (Parenting practices measure – 26 items)	13.2 yrs	Decreased negative effect (Negative affect scale)	Mean 1.5 yrs (SD 0.6 yrs post baseline) Range between T1 and T2 = 0.6 – 3.2 yrs	Stepwise regression	“In terms of hypothesized protective factors, only the parenting practices scale emerged as a significant predictor of time 2 negative affect ($\beta = -.15, p < .01$).”	
(Panter-Brick et al., 2014)	Violence & displacement	Better family Unity (Self-report checklist of past year stressors (15 items) and protective factors (12 Items))	11-16	Less Interference on domains of social life (Strengths & Difficulties questionnaire – Impact scores)	12 months post baseline	Multiple regression analyses	Adjusted regression coefficients, with 95% confidence Intervals -0.44 [-0.93, 0.06] significance 0.05<p<=0.01	*Note: Significant attrition bias due to displacement of families
(Panter-Brick et al., 2014)	Violence & displacement	Better family Unity (Self-report checklist of past year stressors (15 items) and protective factors (12 Items))	11–16	Higher prosocial strength (Strengths & Difficulties questionnaire – prosocial scores)	12 months post baseline	Multiple regression analyses	Adjusted regression coefficients, with 95% confidence Intervals 0.53 [0.31, 0.75] significance p<=0.01	*Note: Significant attrition bias due to displacement of families

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Panter-Brick et al., 2014)	Violence & displacement	Better family life at home (Self-report checklist of past year stressors (15 items) and protective factors (12 Items))	11–16	Lower Psychiatric difficulties (Strengths & Difficulties questionnaire – total difficulties scores)	12 months post baseline	Multiple regression analyses	Adjusted regression coefficients, with 95% confidence Intervals -0.73 [-1.41, -0.05] significance 0.01 < p <= 0.05	*Note: Significant attrition bias due to displacement of families
(Panter-Brick et al., 2014)	Violence & displacement	Better family life at home (Self-report checklist of past year stressors (15 items) and protective factors (12 Items))	11-16	Less Interference on domains of social life (Strengths & Difficulties questionnaire – Impact scores)	12 months post baseline	Multiple regression analyses	Adjusted regression coefficients, with 95% confidence intervals -0.34 [-0.70, 0.02] Significance 0.05 < p <= 0.1	*Note: Significant attrition bias due to displacement of families
(Bowes et al., 2010)	Bullying victimisation	Maternal warmth (5 minute speech sample method)	7 & 10 yrs	Emotional resilience to bullying victimisation (Derived measure using scores at ages 10 and 12)	10 and 12 years	Linear regression model	0.17 (0.11-0.22)	*Note: Adjusted for covariates, IQ, low SES & gender
(Bowes et al., 2010)	Bullying victimisation	Sibling warmth (Mother reported)	7 & 10 yrs	Emotional resilience to bullying victimisation	10 and 12 years	Linear regression model	0.21 (0.15-0.26)	*Note: Adjusted for covariates, IQ, low SES & gender

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				(Derived measure using scores at ages 10 and 12)				
(Bowes et al., 2010)	Bullying victimisation	Positive Atmosphere at home (Coder's Impression Inventory)	7 & 10 yrs	Emotional resilience to bullying victimisation (Derived measure using scores at ages 10 and 12)	10 and 12 years	Linear regression model	0.23 (0.16-0.29)	*Note: Adjusted for covariates, IQ, low SES & gender
(Bowes et al., 2010)	Bullying victimisation	Maternal warmth (5 minute speech sample method)	7 & 10 yrs	Behavioural resilience to bullying victimisation (Derived measure using scores at ages 10 and 12)	10 and 12 years	Linear regression model	Boys 0.29 (0.21-0.37) Girls 0.18 (0.12-0.24)	*Note: Adjusted for covariates, IQ, low SES & gender
(Bowes et al., 2010)	Bullying victimisation Self-report & mother's report	Sibling warmth (Mother reported)	7 & 10 yrs	Behavioural resilience to bullying victimisation (Derived measure using scores at ages 10 and 12)	10 and 12 years	Linear regression model	0.29 (0.23-0.34)	*Note: Adjusted for covariates, IQ, low SES & gender

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Bowes et al., 2010)	Bullying victimisation Self-report & mother's report	Positive atmosphere at home (Coder's Impression Inventory)	7 & 10 yrs	Behavioural Resilience to bullying victimisation (Derived measure using scores at ages 10 and 12)	10 and 12 years	Linear regression model	Boys 0.44 (0.35-0.54) Girls 0.28 (0.19-0.37)	*Note: Adjusted for covariates, IQ, low SES & gender
(Jain et al., 2012)	Witness of community violence	Family support (Provision of Social Relations Instrument)	13.5 (mean)	Emotional resilience (Youth Self Report and Young Adult Self Report scales)	15.5 (mean)	Generalised estimating equations	OR = 1.39 (95% CI [1.18, 1.64]) (p < 0.001) "Four developmental assets [including family support] had positive main effects on odds of emotional resilience...for all youth regardless of violence exposure [i.e. including witnesses of community violence]"	*Note: examined whether family support increased the odds of resilience for witnesses of community violence
(Jain et al., 2012)	Victim of community violence	Family support (Provision of Social Relations Instrument)	13.5 (mean)	Emotional resilience (Youth Self Report and Young Adult Self Report scales)	15.5 (mean)	Generalised estimating equations	OR = 1.27 (95% CI [1.09, 1.48]) p < 0.01 "Four developmental assets [including family support] had positive main effects on odds of emotional resilience...for all youth regardless of violence exposure [i.e. including victims of community violence]"	*Note: examined whether family support increased the odds of resilience for witnesses of community violence

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Stevens et al., 2011)	High level of early adolescent delinquency*	Parental monitoring (Participant report – a composite score based on factors such as how much their parents knew about their friends, school life and leisure time)	12–13 years	Number of offences (i.e. late-adolescent delinquency) (Self-report of illegal behaviours during a year at age 17 or 18)	17–18 years	Multivariate analysis	Analysis run on female youth who had a high level of early delinquency (i.e. aged 12–13) b = -0.830 (p < 0.001) (100[0.436-1]) “For girls in the top 9% of early delinquency [i.e. at age 12–13 years]...a one-unit increase in the Parental Monitoring Scale decreased the expected number of offenses committed during the end of the teenage period by 56%”	Examined which factors promote or discourage delinquency by girls aged 17 and 18 – compared the effects of risk and protective factors for girls who were at high-risk for late adolescent delinquency (displayed high level of early adolescent delinquency) to those who were at low risk for late adolescent delinquency * Re: adversity – early adolescent delinquency was “related to more emotional and behavioural problems, running away from home by age 12 or 13, bullying victimisation, more years as a gang member and living in communities with a gang presence”
(Brookmeyer et al., 2005)	Witnessed community violence	Parent support (Composite measure of six parent involvement items)	11–15 years	Committing acts of violence (adolescents who witness violence but do not perpetrate violence are viewed as resilient in this study because “despite exposure to a high-risk environment,	1 year post baseline	Hierarchical regression analysis	Parent support = Beta = -0.06 (p<0.01) “The witness x parent support buffering interaction did reach significance, however it was nested in a three-way interaction described next [witness x parent support x gender]”	*Note: investigating how resilience factors of parent support (protective factor) may protect adolescents exposed to violence (adversity) from committing violence (measure of resiliency)

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				they have achieved adaptive success")			Parent support x gender = Beta = -0.08, p<0.05 "For males, the Witnessing x parent support interaction was statistically significant, but it was not significant for females"	
(Pargas et al., 2010)	Offspring of mothers who had histories of depression during offspring's early childhood (first five years)	Low perceived maternal psychological control (Adolescent participant report of Parental Behaviour Inquiry – includes participants' perceptions of their mothers and fathers psychological control)	15 years	All of the following: no current Axis 1 diagnosis* (excluding specific phobia), no clinically significant internalising problems, no current academic or work difficulties, no current romantic relationship functioning difficulties, and no history of early onset/recurrent depression or dysthymia	20 years	Logistic regression analysis	OR = 1.11 (95% CI [0.83-0.98]), p 0.02 "Only one parent-child relationship factor at age 15 acted as a protective factor at age 20: low perceived maternal psychological control"	*Note: study differentiates between protective factors and resource factors; protective factors = interacts with a risk factor such that it has an effect on those at high risk but little or no effect on those at low risk; resource factors = positive effect on both groups. Have only include PFs here (those at high risk for depression, not the whole sample) * Axis 1 diagnosis = all psychological diagnostic categories except mental retardation and personality disorder

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Stanton et al., 1995)	Seeing a friend smoke (risk factor)	Mother became a parent after age 19*	Infancy*	Seeing a friend smoke, but not smoking (i.e. resistant to social pressures to smoke) (Self-reported by participants – had they smoked during the past 2 years)	11 years	Hierarchical regression analysis	For girls only – those whose friends smoked at age 9, but they had not smoked during the past 2 years (at age 11): Correlation with smoking = 0.31 Increase in variance explained = 0.12 F for increase = 5.9, p , 0.05** “Significance...is a function of the extent to which [the] variable contributed to an increase in the variance explained in smoking status at each age” “Girls who saw a friend smoke resisted smoking if their mothers hadn’t been a teenage parent”	* Perinatal histories were collected from parents of participants soon after birth ** No further details given about what these terms (e.g. ‘F for increase’) mean
(Stanton et al., 1995)	Seeing a friend smoke (risk factor)	Younger mother*	Infancy**	Seeing a friend smoke, but not smoking (i.e. resistant to social pressures to smoke)	11 years	Hierarchical regression analysis	For girls only – those whose friends smoked at age 9, but they had not smoked during the past 2 years (at age 11):	* Exact age range of ‘younger mother’ not specified, but ‘younger’ was relative to the age of the mothers of other participants in the cohort

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				(Self-reported by participants – had they smoked during the past 2 years)			<p>Correlation with smoking = 0.15</p> <p>Increase in variance explained = 0.18</p> <p>F for increase = 21.1, $p < 0.01^{***}$</p> <p>“Significance...is a function of the extent to which [the] variable contributed to an increase in the variance explained in smoking status at each age”</p> <p>“Girls who saw a friend smoke resisted smoking if their mothers...were relatively young...A mother who has matured more before parenthood but is still relatively young, may have a greater positive influence on her child’s health behaviours and possibly demonstrate the need for social assertive skills</p>	<p>** Perinatal histories were collected from parents of participants soon after birth</p> <p>*** No further details given about what these terms (e.g. ‘F for increase’) mean</p>
(Wolke et al., 2013)	Very preterm and very low birth weight babies	Cognitively stimulating parenting (Structured interview)	6 yrs	School success	13 yrs	Stepwise hierarchical regression	<p>Unstandardised B= .066 (Standard error = .023</p> <p>Standardised B= .104 $p = .005$</p>	<p>“...each SD increase in cognitive stimulation improved school success by .10 SD ($b, p = .005$).” note: this is above and beyond the impact of VP/VLBW</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
		using the Home Observation for Measurement of the Environment Inventory)		(Based on school type, whether the child had ever repeated a class, performance within each track in the core subjects of mathematics and German)			<p>When interaction included in the model:</p> <p>Cognitively stimulating parenting to 6 years</p> <p>Unstandardised B= .063 (Standard error = .032</p> <p>Standardised B= .099 p = .030</p> <p>Interaction 1 (VP/VLBW birth Cognitive stimulation) = N/S</p>	<p>birth, child disability, and SES.</p> <p>“No significant interaction of VP/VLBW birth with cognitive stimulation was found. However, in this last step, the main effect of cognitively stimulating parenting remained significant, whereas the previously significant main effect of sensitivity did not.”</p>
(Wolke et al., 2013)	Very preterm and very low birth weight babies	Sensitive parenting behaviour (Standardised dyadic play situation)	6 yrs	School success (Based on school type, whether the child had ever repeated a class, performance within each track in the core subjects of mathematics and German)	13 yrs	Stepwise hierarchical regression	<p>Unstandardised B= .141 (Standard error = .029)</p> <p>Standardised B= .160 p < .001</p> <p>When interaction included in the model:</p> <p>Sensitive parenting at 6 years = N/S</p>	<p>“Each SD increase in parental sensitivity improved school success by an average of .16 SD (<i>b</i>, <i>p</i> < .001)” note: this is above and beyond the impact of VP/VLBW birth, child disability, and SES.”</p> <p>“...the interaction of parental sensitivity with VP/ VLBW birth significantly predicted school success (<i>p</i> < .001)”</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
							Interaction 2 (VP/VLBW birth _ Sensitivity): Unstandardised B= .377 (Standard error = .118) Standardised B= .184 p < .001	“VP/VLBW children who were raised by parents with high observed sensitivity at age 6 years had school success scores that were similar to term control children. Thus, the adverse effect of VP/VLBW birth was buffered by highly sensitive parenting in middle childhood, whereas VP/VLBW children with low sensitive parenting did particularly poorly.”
(Vanderbilt- Adriance & Shaw, 2008)	Low SES	Parent–child relationship quality (Adult–child Relationship scale)	Age 5&6 years	Positive social adjustment as measured by: Both low levels of anti-social behaviour and high levels of social skills (Combined scores using an adopted version of the self-report anti- social behaviour questionnaire and social skills rating system completed by mothers and teachers)	11 and 12 yrs	Point biserial correlation; multiple regression	parent–child relationship quality ($r=0.25, p<0.001$) parent–child relationship quality ($B=0.45, p<0.05$)	*Note: parent–child relationship quality associated with later positive social adjustment “Similar results were found using multiple logistic regression, with maternal nurturance ($B=0.18, p<$ 0.05), and parent–child relationship quality ($B=0.45, p<$ 0.05) remaining significant.”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Vanderbilt-Adriance & Shaw, 2008)	Low SES	Maternal nurturant parenting (Observation using the Home Observation for Measurement of the Environment)	Age 2 years	Positive social adjustment as measured by: Both low levels of anti-social behaviour and high levels of social skills (Combined scores using an adopted version of the self-report anti-social behaviour questionnaire and social skills rating system completed by mothers and teachers)	11 and 12 yrs	Point biserial correlation; multiple regression	Maternal nurturance ($r=0.25$, $p<0.001$) maternal nurturance: ($B=0.18$, $p<0.05$),	Maternal nurturance significantly associated with later positive social adjustment “Similar results were found using multiple logistic regression, with maternal nurturance ($B=0.18$, $p<0.05$), and parent-child relationship quality ($B=0.45$, $p<0.05$) remaining significant.”
(Hammack et al., 2004)	Exposure to community violence – witnessing community violence	Time spent with family (Based on ESM reports)	Grade 6*	Anxiety symptoms (The trait subscale of the State-Trait Anxiety Inventory for Children (Spielberger, Edwards, Montuori, & Lushene, 1973))	Grade 7*	Hierarchical multiple regression	Note: for girls Sex × witnessing × Time spent with family $F(10, 136) = 8.83$, $p < .001$, $R^2 = .39$	“For girls, time spent with family emerged as a protective-stabilizing factor over time for anxiety symptoms. A Sex × Witnessing × TimeWith Family interaction revealed that girls who reported less time with family in the context of high witnessing at Time 1 reported a greater increase in anxiety at Time 2, $F(10, 136) = 8.83$, $p < .001$, $R^2 = .39$ (see Figure 2). In contrast, girls who spent more time with family reported no significant increase in anxiety as a

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								<p>function of witnessing violence. The longitudinal data from boys demonstrated no significant interaction for anxiety.”</p> <p>**** Note: have just reported longitudinal association</p> <p>* The exact age of participants is not specified but the study states that participants are adolescents</p>
(Hammack et al., 2004)	Exposure to community violence – victims of community violence	Maternal closeness (brief questionnaire based on measures created by Blyth and Foster-Clark (1987))	Grade 6*	Depressive symptoms (Children’s Depression Inventory (Kovacs, 1985))	Grade 7*	Hierarchical multiple regression	<p>Note: for girls</p> <p>Sex × Victim × Maternal closeness</p> <p>$F(10, 143) = 4.43, p < .001, R^2 = .24$</p>	<p>“The single significant longitudinal interaction predicting depressive symptoms at Time 2 revealed maternal closeness as a promotive–reactive for boys over time. Probing of the Sex Victimization × Maternal Closeness interaction indicated that, for boys reporting high maternal closeness at Time 1, low victimization predicted fewer depressive symptoms, $F(10, 143) = 4.43, p < .001, R^2 = .24$. High victimization predicted increased depressive symptoms over time for boys reporting high maternal closeness at Time 1. This finding suggests</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								<p>that at high levels of risk, maternal closeness fails to reduce vulnerability for depression.”</p> <p>* The exact age of participants is not specified but the study states that participants are adolescents</p> <p>**** Note: have just reported longitudinal association</p>
(Dubow et al., 2001)	<p>** Difficult to extract</p> <p>Schools were located in county with second highest adolescent pregnancy rate in the state, and 2/3+ of students qualified for free and reduced lunch rates</p>	<p>Family support</p> <p>(abbreviated version of the family and peer support subscales from the Social Support Appraisals Scale of the Survey of Children’s Social Support (Dubow et al., 1997); for the original version, see Dubow & Ullman, (1989).)</p>	<p>Unclear (data collected from Grade 6, Grade 7 and Grade 8 students).</p> <p>Time 1 – September</p>	<p>Positive future expectations</p> <p>(Revised version of the Wyman et al. (1993) future expectations scale)</p>	<p>Unclear (data collected from Grade 6, Grade 7 and Grade 8 students).</p> <p>Time 2 – June</p>	Hierarchical regression	Beta = .49, p<.01	<p>“Students who reported initially higher levels of family support showed increases in positive expectations for the future”</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(McVie, 2014)	Bullying perpetration (risk factor)	Parental supervision (child self-reports and a survey of family – three items taken from the Supervision/Involvement Scale of the Pittsburgh Youth Study)	15	Participation in violence (self-reported – participants asked whether they had committed any of five acts of violence)* * Not participating in violence is the resilient outcome – but the results are presented in the table according to predictability of participation in violence at age 17 – hence the negative effect sizes	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on violence at age 17, controlling for parental supervision: B = -0.69, SE = 0.17, p < 0.001 “At the family level, living in a stable family environment with both birth parents, being in the highest quartile for level of parental supervision and monitoring and the lowest quartile for parent-child conflict... significantly reduced the probability of being violent at age 17”	
(McVie, 2014)	Bullying perpetration (risk factor)	Stable family structure (as measured by the child living consistently with both birth parents – binary measure = either living with both birth parents or living with only one or no	15	Participation in violence (self-reported – participants asked whether they had committed any of five acts of violence)*	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on violence at age 17, controlling for stable family structure: B = -0.35, SE = 0.12, p < 0.01 “At the family level, living in a	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
		birth parents)		* Not participating in violence is the resilient outcome – but the results are presented in the table according to predictability of participation in violence at age 17 – hence the negative effect sizes			stable family environment with both birth parents, being in the highest quartile for level of parental supervision and monitoring and the lowest quartile for parent-child conflict... significantly reduced the probability of being violent at age 17”	
(McVie, 2014)	Bullying perpetration (risk factor)	Infrequent parent–child conflict (as measured by how often the child reports arguing with parents)	15	Participation in violence (self-reported – participants asked whether they had committed any of five acts of violence)* * Not participating in violence is the resilient outcome – but the results are presented in the table according to predictability of participation in violence at age 17 – hence the negative effect sizes	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on violence at age 17, controlling for infrequency parent-child conflict: B = -0.41, SE = 0.15, p < 0.01 “At the family level, living in a stable family environment with both birth parents, being in the highest quartile for level of parental supervision and monitoring and the lowest quartile for parent-child conflict... significantly reduced the probability of being violent at age 17”	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(McVie, 2014)	Bullying victimisation (a bully victim at age 13–16)	Parental interest in education (Child reported series of questions e.g. how often do your parents help with problems at school)	12	Psychological distress (reduced version of the Hospital Anxiety and Depression Scale (HADS)* * Low levels of psychological distress is the resilient outcome – but the results are presented in the table according to predictability of psychological distress at age 17 – hence the negative effect sizes	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on psychological distress at age 17, controlling for parental interest in education: B = -0.64, SE = 0.12, p < 0.001 “The only significant family level variable was parental interest in education, which indicated that those youths whose parents had demonstrated greater engagement with the school system (perhaps as a result of the bullying victimisation) were more resilient to later distress”	
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from Olweus, 1993	Low parental conflict (conflict with parents) Author developed	12 & 13 yrs	Emotional resilience Bowes et al. (2010) Regression depression scores at age 14 yrs on levels of bullying victim	14 yrs	Hierarchical Regression	Beta = 0.13 p < 0.001	“Only low levels of family discord (B= .13, p < .001) and sibling victimization (B = .06, p < .01) were statistically significant predictors of emotional resilience to bullying. The full model accounted for 12% of the variance in emotional resilience to bullying victimization.”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from Olweus, 1993	Low sibling victimisation Author developed	13 yrs	Emotional resilience Bowes et al. (2010) Regression depression scores at age 14 yrs on levels of bullying victim	14 yrs	Hierarchical Regression	Beta = 0.06 p<0.01	
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from Olweus, 1993	Low parental conflict (conflict with parents) Author developed	12 & 13 yrs	Behavioural resilience Similar methodology to emotional regressing delinquency scores at age 14 yrs on levels of bullying victimisation	14 yrs	Hierarchical Regression	Beta = 0.28 p<0.001	
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from Olweus, 1993	Low sibling victimisation Author developed	13 yrs	Behavioural resilience Similar methodology to emotional regressing delinquency scores at age 14 yrs on levels of bullying victimisation	14 yrs	Hierarchical Regression	Beta = 0.05 p<0.05	

Appendix 6: Protective factors – Peer factors

See Appendix 4 for a description of the information presented in the table below.

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Salzinger et al., 2011)	Exposure to violence (time 2)	Friend attachment (Armsden and Greenberg's (1987) Inventory of parent peer attachment)	7th Grade (Time 2)	Internalising problems (Internalising scale of the YSR)	8th Grade (Time 3)	Hierarchical linear regression	B = -.13 p < .01 Community violence × Friend attachment, B = -.11 p < .01	“Moderating effects of attachment to parents and attachment to friends were found on the relation between community violence in year 2 and internalizing problems in year 3.” “attachment to friends was more protective under conditions of high exposure” *Note: Analyses controlled for gender and year/household dysfunction
(Shahar et al., 2009)	Exposure to suicide bombing (Bombing-related perceived)	High friend social support (Abbreviated form of the Perceived Social Support Scale)	7th – 9th grade	Depressive symptoms (Children's version of the Center for Epidemiologic studies Child Depression scale)	1 month after bombing; approx. 8 months after baseline assessment	Multiple linear regression analyses	Interaction between bombing-related perceived stress and friends' social support (B = -.29; P = .010) was significant predictor of post bombing depression	Examined buffering effects of social support. Social support (prior to bombing) buffered the effect of bombing related perceived stress and continuous depression “bombing-related perceived stress was strongly associated with

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
	stress)							<p>increased postbombing depression (controlling for prebombing depression) when prebombing friends' social support was low (1 SD below average, $B = .61$; $P < .001$) but not when friends' social support was high (1 SD above average, $B = .00$; $P = .98$)." <p>"...under low bombing-related perceived stress, social support from friends predicted an increase in adolescent depression over time ($B = .34$; $P = .026$)." </p> </p>
(Tiet et al., 2010)	High-risk neighbourhood	<p>Less involvement with delinquent peers</p> <p>(Adapted from the National Youth Survey, Involvement with Delinquent peers)</p>	T1. 11, 13 and 15 year olds	<p>Adjustment (academic performance, self-esteem, psychosocial functioning)</p> <p>(Academic performance (self-report of grades in school), self esteem, (self-esteem scale by Rosenberg 1965), psychosocial functioning (parent/guardian's response to 6 sub-</p>	T2. 12 months post baseline	Path analysis	<p>Analysis on full sample: Bivariate correlations: Unstandardised coefficients = $-.18$ $p < .001$</p> <p>When resilience at time 1 was included in the model, Less involvement with delinquent peers: Unstandardised coefficients = $-.10$, $p < .001$</p> <p>Analysis run on subsample of youths living in two-parent guardian household (included</p>	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				scales of the Child Behaviour Checklist)			parent discord in analysis). Less involvement with delinquent peers: Unstandardised coefficients = $-.19$, $p < .001$ Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). When resilience at time 1 was included in the model Less involvement with delinquent peers: Unstandardised coefficients = $-.16$, $p < .001$	
(Tiet et al., 2010)	High-risk neighbourhood	Less involvement with delinquent peers (Adapted from the National Youth Survey, Involvement with Delinquent peers)	T1. 11, 13 and 15 year olds	Low levels of antisocial behaviour (Absence of or low levels of gang involvement – self report; Delinquency– Self Report Delinquency (SRD) measure); Drug use – Self Drug Use Inventory)	T2. 12 months post baseline	Path analysis	Analysis on full sample: Bivariate correlations- Unstandardised coefficients = $.21$ $p < .001$ Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). Less involvement with delinquent peers: Unstandardised coefficients = $.13$, $p < .001$	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Criss et al., 2002)	Family adversity-ecological disadvantage	Peer acceptance (Children asked to nominate 3 peers they liked and 3 they disliked, peer acceptance = standardised difference between the liking and disliking nomination scores)	Grade 1 and kinder were averaged	Externalising behaviours (Child Behaviour Checklist – teacher report form)	Grade 2	Hierarchical regression	Peer acceptance: Standardised B = -.37, p <.001 Peer acceptance X Ecological disadvantage: Standardised B = -.12, p <.01	Examined whether peer acceptance moderated link between family adversity and externalising problems “family adversity variable was significantly associated with child externalizing behavior at low or medium levels of peer acceptance”
(Criss et al., 2002)	Family adversity-violent marital conflict	Peer acceptance (Children asked to nominate 3 peers they liked and 3 they disliked, peer acceptance = standardised difference between the liking and disliking nomination scores)	Grade 1 and kinder were averaged	Externalising behaviours (Child Behaviour Checklist – teacher report form)	Grade 2	Hierarchical regression	Peer acceptance: Standardised B = -.36, p <.001 Peer acceptance X violent marital conflict: Standardised B = -.17, p <.001	Examined whether peer acceptance moderated link between family adversity and externalising problems “Family adversity variable was significantly associated with child externalizing behavior at low levels of peer acceptance.”
(Criss et al., 2002)	Family adversity – harsh discipline	Peer acceptance	Grade 1 and kinder were averaged	Externalising behaviours	Grade 2	Hierarchical regression	Peer acceptance: Standardised B = -.40, p <.001	Examined whether peer acceptance moderated link between family adversity and externalising problems

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
		(Children asked to nominate 3 peers they liked and 3 they disliked, peer acceptance = standardised difference between the liking and disliking nomination scores)		(Child Behaviour Checklist – teacher report form)			Peer acceptance X harsh discipline : Standardised B = -.08, p <.05	“family adversity variable was significantly associated with child externalizing behavior at low or medium levels of peer acceptance”
(Criss et al., 2002)	Family adversity – ecological disadvantage	Friendships (Reciprocal ratings of likeness = friendship)	Grade 1 and kinder were averaged	Externalising behaviours (Child Behaviour Checklist – teacher report form)	Grade 2	Hierarchical regression	Friendships: Standardised B = -.19, p <.001 Friendships X ecological disadvantage : Not significant	Examined whether friendships moderated link between family adversity and externalizing problems
(Criss et al., 2002)	Family adversity – violent marital conflict	Friendships (Reciprocal ratings of likeness = friendship)	Grade 1 and kinder were averaged	Externalising behaviours (Child Behaviour Checklist – teacher report form)	Grade 2	Hierarchical regression	Friendships: Standardised B = -.19, p <.001 Friendships X violent marital conflict: Not significant	Examined whether friendships moderated link between family adversity and externalizing problems

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Criss et al., 2002)	Family adversity – harsh discipline	Friendships (Reciprocal ratings of likeness = friendship)	Grade 1 and kinder were averaged	Externalising behaviours (Child Behaviour Checklist – teacher report form)	Grade 2	Hierarchical regression	Friendships: Standardised B = -.21, p <.001 Friendships X harsh discipline: Standardised B = -.09, p <.05	Examined whether friendships moderated link between family adversity and externalising problems “harsh discipline was significantly related to child externalizing behavior for children with average or below average number of friends, but harsh discipline was unrelated to later externalizing for children with relatively many friends”
(Jain et al., 2012)	Witness of community violence	Friend support (Provision of Social Relations Instrument)	13.5 (mean)	Emotional resilience (Based on Youth Self Report and Young Adult Self Report scales (Achenbach, 1991))	15.5 (mean)	Generalised estimating equations	OR = 1.31 (95% CI [1.08, 1.12]) (p < 0.001) “Four developmental assets [including friend support] had positive main effects on odds of emotional resilience...for all youth regardless of violence exposure [i.e. including witnesses of community violence]”	Examined whether friend support increased the odds of resilience for witnesses of community violence

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Jain et al., 2012)	Witness of community violence	Positive peer influence (10 items from Deviance of Peers instrument; “captures whether friends model responsible behaviour”)	13.5 (mean)	Emotional resilience (Based on Youth Self Report and Young Adult Self Report scales (Achenbach, 1991))	15.5 (mean)	Generalised estimating equations	OR = 1.21 (95% CI [1.02, 1.43]) p < 0.05 “Each unit increase in positive peers...significantly increased the odds of resilience” [for witnesses of violence]	Examined whether positive peer influence increased the odds of resilience for witnesses of community violence
(Jain et al., 2012)	Victim of community violence	Friend support (Provision of Social Relations Instrument)	13.5 (mean)	Emotional resilience (Based on Youth Self Report and Young Adult Self Report scales (Achenbach, 1991))	15.5 (mean)	Generalised estimating equations	OR = 1.30 (95% CI [1.10, 1.55]) p < 0.01 “Four developmental assets [including friend support] had positive main effects on odds of emotional resilience...for all youth regardless of violence exposure [i.e. including victims of community violence]”	Examined whether friend support increased the odds of resilience for victims of community violence
(Jain & Cohen, 2013)	Exposure to community violence	Positive peers (10 items Deviance of Peers survey developed and validated by Huizinga et al. (1991))	Mean = 13.5 years	Behavioural adaptation (externalising problem score) (Achenbach's Youth or Young Adult Self Report)	15.5 yrs, and 18.1 years	Multilevel generalised estimating equations	Predicts rate of change in outcome: Unexposed group: odds ratio=1.42 (95 % CI 1.17, 1.72), p < 0.01	“Having positive peers at baseline (under the domain of boundaries and expectations) increased the odds of behavioral adaptation 7 years later, for the unexposed by 42%, witnesses by 13 %, and victims by 9% by wave 3 (Table 3,

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				scale)			<p>Victim group: odds ratio= .76 (95 % CI 0.62,0.95), p <0.05</p> <p>Witness group: odds ratio= .80 (95 % CI 0.63, 1.13), p<0.10 (n/s)</p>	p00.05) (Table 4)."
(Banks & Weems, 2014)	Exposure to hurricane Katrina	Peer-social support (Short form of the Survey of Children's Social Support)	Median age 11.5 yrs Time 1 = 24 months post Hurricane	Depressive symptoms (Modified version of the Revised Child Anxiety and Depression scale)	Time 2 = approx. 6 months after time 1 and 30 months post Hurricane	Correlation Regression	<p>Correlations between peer social support (time 1) and depressive symptoms (time 2)</p> <p>Correlation = -.37 p <.01</p> <p>B = -1.19, SE B = .51 B = -.18 t = -2.36 p <.05</p>	<p>"Social support from peers was significantly negatively related to both Time 1 and Time 2 symptoms of PTSD, anxiety, and depression."</p> <p>"Regression analyses were then conducted to examine whether lower levels of social support were associated with higher Time 2 psychological distress while controlling for hurricane exposure, major life events, Time 1 psychological distress, age, and gender (see Table 4). Results showed that peer social support was significantly predictive of lower depression at Time 2..."</p> <p>"Longitudinally, higher peer social support was also associated with lower levels of PTSD, anxiety, and depression symptoms, and</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								remained uniquely associated with lower depression even while controlling for additional factors such as major life events and distress reported at the initial assessment"
(Banks & Weems, 2014)	Exposure to hurricane Katrina	Peer-social support (Short form of the Survey of Children's Social Support)	Median age 11.5 yrs Time 1 = 24 months post Hurricane	Post traumatic stress disorder (Modified version of the Posttraumatic Stress Reaction Index for Children)	Time 2 = approx. 6 months after time 1 and 30 months post Hurricane	Correlation	Correlations between peer social support (time 1) and PTSD (time 2) Correlation = -.31 p <.01	"Social support from peers was significantly negatively related to both Time 1 and Time 2 symptoms of PTSD, anxiety, and depression." *Note: This protective factor was not significant in regression controlling for additional factors
(Banks & Weems, 2014)	Exposure to hurricane Katrina	Peer-social support (Short form of the Survey of Children's Social Support)	Median age 11.5 yrs Time 1 = 24 months post Hurricane	Anxiety (Modified version of the Revised Child Anxiety and Depression scale)	Time 2 = approx. 6 months after time 1 and 30 months post Hurricane	Correlation	Correlations between peer social support (time 1) and anxiety (time 2) Correlation = -.37 p <.01	"Social support from peers was significantly negatively related to both Time 1 and Time 2 symptoms of PTSD, anxiety, and depression." *Note: This protective factor was not significant in regression controlling for additional factors

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Self-Brown et al., 2013)	Hurricane Katrina affected youth	Peer social support (The social support scale for children(SSSC),(Harter, 1985) – only parent and peer scales used))	*Note: Difficult to determine which wave (age) was used in the analysis	Resilient (based on PTSD symptom severity) (The UCLAPTS Reaction Index – Revision 1 (Pynoos et al., 1998))	*Note: difficult to determine age at which resilience was measured. Appears that Growth curves based on data collected from 3–22 months post baseline	Growth curve models. Odds ratios presented	OR = .16, [CI = .04–.63].	The growth curve models identified 3 groups: Resilient, chronic and recovering. “For every additional unit of social support, children were .84 times less likely to fall in the Chronic versus the resilient group” “Peer social support emerged as a critically important protective factor for youth participants in this project. This protective factor distinguished between the resilient and chronic classes, as well as the chronic and recovering classes.” * Note: It was difficult to determine which wave (age) was used in the analysis
(Crosnoe & Elder, 2004)	Parent- and family-related problems at home	Friend support – (measured by author-designed questionnaire)	Wave 1 (1994–1995) mean age: 16.0	Academic resilience – (measured by author-designed questionnaire)	Wave 2 (1995)	Structural modelling equations	High school (n=8,532) “b = .15* (.17); B= .02” p<.05 Middle school (n=3,045) “b = .08 (.11); B= .01” (n/s)	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Betancourt et al., 2010)	Being a child soldier; being raped, killing or injuring people during war	Social support	15.1 – 21.8	Adaptive/prosocial behaviours (Oxford Measure of Psychological Adjustment)	21.8	Multilevel linear growth modelling	“social support (b=0.93, p=0.006) was associated with increased prosocial/adaptive behaviours over time.”	
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from Olweus, 1993	Less social alienation (Composite index of 6 self-report items. Alienation scale of the MPQ (Tellegen, 1981)	12 yrs	Emotional resilience (Bowes et al. (2010) Regression depression scores at age 14 yrs on levels of bullying victim)	14 yrs	Hierarchical Regression	Beta = -0.08 p<0.001	“individual variables alone accounted for 10% of the total variance of emotional resilience to bullying. Being male ($B = .21$, $p < .001$), having high self-esteem ($B = .17$, $p < .001$) and feeling less socially alienated ($B = -.08$, $p < .001$) significantly predicted emotional resilience to bullying victimization.”
(Sapouna & Wolke, 2013)	Bullying victimisation Composite score based on 4 items from Olweus, 1993	Less close friends (Single question asked at age 12)	12 yrs	Behavioural resilience (Similar methodology to emotional resilience – regressing delinquency scores at age 14 yrs on levels of bullying victimisation)	14 yrs	Hierarchical Regression	Beta = - 0.11 p<0.001	“The inclusion of environmental variables in step 2 of the model further increased its predictive power ($\Delta R^2 = .09$, $p < .001$). Low levels of family discord ($B = .28$, $p < .001$), low levels of sibling victimization ($B = .05$, $p < .05$) and less close friends ($B = -.11$, $p < .001$) were statistically significant predictors of emotional resilience to bullying.”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								“The full model accounted for 12% of the variance in behavioral resilience to bullying victimization”

Appendix 7: Protective factors – School factors

See Appendix 4 for a description of the information presented in the table below.

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Tiet et al., 2010)	High-risk neighbourhood	Bonding to teachers (2 items asking how many teachers youths liked and how much youths want to be like teachers they like)	T1. 11, 13 and 15 year olds	Low levels of antisocial behaviour (Absence of or low levels of gang involvement – self report; Delinquency – self Report Delinquency (SRD) measure); Drug use – self Drug Use Inventory)	T2. 12 months post baseline		Analysis on full sample: Bivariate correlations – Unstandardised coefficients = $-.08$ $p < .001$ When resilience at time 1 was included in the model, higher levels of bonding to teachers : Unstandardised coefficients = $-.05$, $p < .01$	
(Tiet et al., 2010)	High-risk neighbourhood	School commitment (Based on measure by Johnson 1979)	T1. 11, 13 and 15 year olds	Adjustment (academic performance, self-esteem, psychosocial functioning) (Academic performance (self-report of grades in	T2. 12 months post baseline	Path analysis	Analysis on full sample: Bivariate correlations – Unstandardised coefficients = $.07$ $p < .01$	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
				school), self esteem, (self-esteem scale by Rosenberg, 1965), psychosocial functioning (parent/guardian's response to 6 sub-scales at Child Behaviour Checklist))				
(Tiet et al., 2010)	High-risk neighbourhood	Involvement in extracurricular activities (8 items about involvement in different types of extramural activities in school and community activities)	T1. 11, 13 and 15 year olds	Adjustment (academic performance, self-esteem, psychosocial functioning) (Academic performance (self-report of grades in school), self-esteem, (self-esteem scale by Rosenberg, 1965), psychosocial functioning (parent/guardian's response to 6 sub-scales at Child Behaviour Checklist))	T2. 12 months post baseline	Path analysis	Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). More involvement in extracurricular activities Unstandardised coefficients = .07, p<.05 Analysis run on subsample of youths living in two-parent guardian household (included parent discord in analysis). When resilience at time 1 was included in the model : More involvement in extracurricular activities: Unstandardised coefficients = .06, p<.05	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Reynolds, 1998)	At risk due to poverty and associated factors	Academic achievement (Reading comprehension and maths total)	Grade 3	Scholastic resilience (Those who satisfied 3 out of 4 indicators were classified scholastically resilient: – At or above 6th grade national average in reading comprehension on the ITBS; – At or above 6th grade national average in mathematics total achievement on the ITBS – had never repeated a grade – never been placed in Special Ed during 5th or 6th grade)	Grade 6	Logistic (nonlinear regression). Multiple (linear) regression coefficients for the model provided)	Change in rate of resilience vis-à- vis nonresilience = 0.014 $p < .01$	“Scholastic resilience. Of the three significant predictors of scholastic resilience, third-grade academic achievement was predominant, indicating that better school performance at the end of early childhood substantially increases the likelihood of scholastic resilience in early adolescence. The regression coefficient indicates that a one-point increase in achievement is associated with a 1.4 percentage-point higher rate of resilience. Holding other factors constant, a five-point increase in achievement (about five months of performance) is associated with a seven percentage-point increase in scholastic resilience (a 33% increase over a sample baseline rate of 21%”
(Reynolds, 1998)	At risk due to poverty and associated factors	Academic achievement (Reading comprehension and maths total)	Grade 3	Social resilience (those who satisfied 2 out of 3 teacher rated classroom-related adjustment indicators were classified socially resilient)	Grade 6	Logistic (nonlinear regression)	Change in rate of resilience vis-à- vis non-resilience = 0.003 $p < .01$	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Reynolds, 1998)	At risk due to poverty and associated factors	Academic achievement (Reading comprehension and maths total)	Grade 3	Scholastic and social resilience (Composite measure of reading comprehension, maths, ever repeated a year, special education placement, classroom related adjustment)	Grade 6	Logistic (nonlinear regression)	Change in rate of resilience vis-à- vis non-resilience = 0.010 p<.01	
(Reynolds, 1998)	At risk due to poverty and associated factors	Classroom adjustment (Teacher rating of child's socio-emotional adjustment to classroom)	Grade 3	Social resilience (those who satisfied 2 out of 3 teacher rated classroom-related adjustment indicators were classified socially resilient)	Grade 6	Logistic (nonlinear regression)	Change in rate of resilience vis-à- vis non-resilience = 0.016 p<.01	"On average, the rate of resilience for girls was 13 percentage-points higher than boys. A three-point change in classroom adjustment (SD = .6) was associated with a five percentage-point increase in social resilience"
(Reynolds, 1998)	At risk due to poverty and associated factors	Classroom adjustment (Teacher rating of child's socio-emotional adjustment to classroom)	Grade 3	Scholastic and social resilience (Composite measure of reading comprehension, maths, ever repeated a year, special education placement, classroom related adjustment)	Grade 6	Logistic (nonlinear regression)	Change in rate of resilience vis-à- vis non-resilience = 0.014 p<.01	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Mikami & Hinshaw, 2006)	Childhood ADHD – diagnosis and peer rejection	Self-perceived scholastic competence (Harter self-perception profile for children)	11-18 yrs	Lower adolescent internalising behaviour. (CBCL – parent and teacher report)	4.5 yrs post baseline	Hierarchical regression. R2 change	“self-perceived scholastic competence in childhood negatively predicted adolescent internalizing problems (R2 change =.02; p<.05).”	“Effect sizes for both the risk factors (ADHD and peer rejection) and the protective factors (self-perceived scholastic competence and low goal-directed play) on adolescent adjustment were small to medium.” “findings held after control of peer rejection, ADHD, and childhood academic achievement.” – for internalising behaviour
(Mikami & Hinshaw, 2006)	Childhood ADHD – diagnosis and peer rejection	Self-perceived scholastic competence (Harter self-perception profile for children)	11-18 yrs	Lower Adolescent substance use (Substance Abuse Questionnaire (see Marshal et al., 2003; Molina, 1995))	4.5 yrs post baseline	Hierarchical regression. R2 change	“Self-perceived scholastic competence also negatively predicted adolescent substance use (R2 change =.04; p<.01)”	“findings held after control of peer rejection, ADHD, and childhood academic achievement.” – and for adolescent substance use
(Mikami & Hinshaw, 2006)	Childhood ADHD – diagnosis and peer rejection	Self-perceived scholastic competence (Harter self-perception profile for children)	11-18 yrs	Lower Adolescent externalising behaviour (CBCL – parent and teacher report)	4.5 yrs post baseline	Hierarchical regression. R2 change	“self-perceived scholastic competence negatively predicted externalizing behaviors (R2 change =.02; p<.05), after control of childhood externalizing problems, peer rejection, ADHD, and academic achievement”	“By contrast, predictions between baseline and follow-up measures of adjustment were large: R2= .31 for externalizing symptoms, R2= .29 for internalizing symptoms, and R2= .67 for academic achievement.”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Jain & Cohen, 2013)	Exposure to community violence	Meaningful participation in school or after-school activities (Youth Interview Scale)	Mean = 13.5 years	behavioural adaptation (externalising problem score) (Achenbach's Youth or Young Adult Self Report Scale)	15.5 yrs	Multilevel generalised estimating equations	Unexposed group: Odds ratio=2.66 (95 % CI 1.23, 5.75), p < 0.05 Victim group: Odds ratio= .40 (95 % CI 0.18,0.83), p <0.05 Witness group: Odds ratio= .37 (95 % CI 0.17,0.83), n/s	“Meaningful participation in structured opportunities at baseline significantly modified the association between exposure to violence and behavioral adaptation at wave 2 (Wald test for interaction χ^2 statistic = 5.44, p=0.07) (Table 3). Each unit increase in hours spent in opportunities at baseline was associated with an increased odds of adaptation for the unexposed group by 2.7 times (odds ratio=2.66 (95 % CI 1.23, 5.75)) (Table 4). Participation in meaningful opportunities was most beneficial for the unexposed group though victims (by 7%) and witnesses (by 0.5%) also had slightly higher odds of behavioral adaptation at wave 2 with each unit increase in hours spent in structured activities.”
(Cappella & Weinstein , 2001)	Academic risk = low reading proficiency on entry to high school	Future educational expectations	8th Grade	Academic resilience	12th Grade	Simultaneous multiple regression	SE = .013 B = 0.056 t = 1.991 p <.05	“We found that locus of control and future expectations predicted academic resilience in 12th grade after controlling for the other psychological variables.”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
	age grade 8	(1 item measuring students highest level of education expected to attain)		(Above or average proficiency level reading achievement test scores by Grade 12)				<p>“Within the psychological domain, locus of control predicted academic resilience beyond the demographic and school environmental characteristics, but future expectations did not.”</p> <p>“Finally, the link between 8th grade educational aspirations and 12th grade academic resilience was fully mediated by high school academic coursework”</p>
(Cappella & Weinstein , 2001)	Academic risk= low reading proficiency on entry to high school age grade 8	Academic curriculum (Based on 12th grade transcripts – Did student complete a new basic curriculum)	12th grade	Academic resilience (Above or average proficiency level reading achievement test scores by Grade 12)	12th Grade	Simultaneous multiple regression	<p>SE = .028 B = 0.218 t = 6.031 p <.001</p> <p>SE = .024 B = 0.150 t = 4.764 p <.001</p>	<p>“The school environmental factor of academic curriculum retained significance after controlling for the demographic and psychological protective factors.”</p> <p>*Note: There is some question as to whether this association is based on a cross-sectional analysis.</p>

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Crosnoe & Elder, 2004)	Parent- and family-related problems at home	Teacher bonding – (measured by author-designed questionnaire)	16.0	Academic resilience – (measured by author-designed questionnaire)	Wave 2 (1995)	Structural modelling equations	High school (n=8,532) “b = -.38*** (.05); B= -.11” p <.001 Middle school (n=3,045) “b = -.37*** (.06); B= -.11”	
(Derauf et al., 2011)	Child-level risk factors 7 risks measured and combined	Positive relationships (between childcare worker and children) (Field worker assessment using early childhood environmental rating scale-revised edition, early childhood environmental rating scale – extension, The caregiver interaction scale)	36 mths	General cognitive ability British ability scales	58 months	Interaction effect	Unstandardised B = 0.04 p<0.05	“differentiation in the size of risk contributions suggests that (for child development) it was what parents did, rather than who parents were, that was of greatest importance”
(Derauf et al., 2011)	Child-level risk factors	Positive relationships and duration of preschool attendance	36 mths	Self-regulation	58 months	Interaction effect, 3-way interaction.	Unstandardised B = 0.04 p<0.01	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
	7 risks measured and combined	(Field worker assessment using early childhood environmental rating scale-revised edition, early childhood environmental rating scale – extension, The caregiver interaction scale)		(Child social behavior questionnaire)				
(Derauf et al., 2011)	Child-level risk factors 7 risks measured and combined	Positive relationships and duration of pre- school attendance (Field worker assessment using early childhood environmental rating scale-revised edition, early childhood environmental rating scale – extension, The caregiver interaction scale)	36 mths	Antisocial/worried behavior (Child social behavior questionnaire)	58 months	Interaction effect, 3- way interaction.	Unstandardised B = -0.06 p<0.001	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Derauf et al., 2011)	Child-level risk factors 7 risks measured and combined	Preschool educational quality (Field worker assessment using early childhood environmental rating scale-revised edition, early childhood environmental rating scale – extension, The caregiver interaction scale)	36 mths	General cognitive ability (British ability scales)	58 months	Interaction effect	Unstandardised B = 0.02 p<0.05	
(Derauf et al., 2011)	Child-level risk factors 7 risks measured and combined	Preschool educational quality and duration of preschool attendance (Field worker assessment using early childhood environmental rating scale-revised edition, early childhood environmental rating scale – extension, The caregiver interaction scale)	36 mths	Antisocial/worried behavior (Child social behavior questionnaire)	58 months	Interaction effect, 3-way interaction.	Unstandardised B = -0.05 p<0.05	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Derauf et al., 2011)	Family-level risk factors 14 risks measured and combined	Global quality of preschool (Field worker assessment using early childhood environmental rating scale-revised edition, early childhood environmental rating scale – extension, The caregiver interaction scale)	36 mths	General cognitive ability (British ability scales)	58 months	Interaction effect	Unstandardised B = 0.03 p<0.001	
(Derauf et al., 2011)	Family-level risk factors 14 risks measured and combined	Preschool educational quality (Field worker assessment using early childhood environmental rating scale-revised edition, early childhood environmental rating scale – extension, The caregiver interaction scale)	36 mths	General cognitive ability (British ability scales)	58 months	Interaction effect	Unstandardised B = 0.02 p<0.01	

Appendix 8: Protective factors – Community factors

See Appendix 4 for a description of the information presented in the table below.

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Zimmerman et al., 1999)	Personal helplessness	Sociopolitical control (Sociopolitical Control scale – Zimmerman & Zahniser, 1991)	Mean age 16.8 yrs	Mental health – Psychological symptoms (Anxiety and depression subscales of the Brief Symptom Inventory)	6 months follow up	Regression and interaction effects	Socio-political control, $b = -.13$ (standardised $B = .17$), $t = -2.4$ $r^2 = .03$ $p < .05$ Helplessness X socio-political control, $b = -.03$ (standardised $B = -.19$), $t = -2.85$, $r^2 = .03$ $p < .05$	** Examined the “effect socio-political control may have on the relationship between personal helplessness and mental health outcomes” “The interaction effect indicates that the negative effects of personal helplessness on the change in mental health over time vary according to the levels of socio-political control” Further analysis on interaction terms: “the nature of the interactions is that the magnitude of the relationship between personal helplessness and psychological symptoms and self-esteem are reduced at high levels of socio-political control”

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								“... results indicate that at average or below average levels of socio-political control, personal helplessness covaries with psychological symptoms, but the relationship between personal helplessness and mental health disappears at above average scores of sociopolitical control”
(Zimmerman et al., 1999)	Personal helplessness	Socio-political control (Socio-political Control scale – Zimmerman & Zahniser, 1991)	Mean age 16.8 years	Mental health – Self esteem (Rosenberg’s Self-esteem scale)	6 months follow up	Regression and interaction effects	Helplessness X socio-political control, $b = -.01$ (standardised $B = .14$), $t = -2.12$, $r^2 = .02$ $p < .05$	Examined the “effect socio-political control may have on the relationship between personal helplessness and mental health outcomes” “... the negative effects of personal helplessness on the change in self-esteem over time are modified by changes in socio-political control” Further analysis on interaction terms: “the nature of the interactions is that the magnitude of the relationship between personal helplessness and psychological

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
								<p>symptoms and self-esteem are reduced at high levels of socio-political control”</p> <p>“... results indicate that at average or below average levels of socio-political control, personal helplessness covaries with psychological symptoms, but the relationship between personal helplessness and mental health disappears at above average scores of socio-political control”</p> <p>“the association between personal helplessness and self-esteem diminishes at high levels of socio-political control”.</p>
(Leon et al., 2008)	Sexual abuse – measured by self-report scale developed by “the research team at CAUSES”	Greater perceived caseworker agency support (Foster parent rated 9-item author developed scale)	13.2 yrs	Lower or stable sexually ruminative thoughts (Sexually ruminative thoughts scale)	Mean 1.5 yrs (SD 0.6 yrs post baseline) Range between T1 and T2 = 0.6 - 3.2 yrs	Stepwise regression	“However, the interaction of caseworker agency support and sexual abuse was significant ($\beta=.24, p<.01$)”	“Examining Figure 1, it becomes apparent that youth with sexual abuse histories whose foster parents do not believe they are supported by their DCFS caseworkers have the highest levels of sexually ruminative thoughts. The slope of the low-support agency line is significantly greater than zero while the high-

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
	Only 23% of the sample reported sexual abuse							support agency line is not significantly different from zero. According to Luthar et al.'s (2000) typology, this suggests that caseworker support is a protective-stabilizing variable. Luthar et al. (2000) describe this as occurring when the characteristic provides stability in competence despite increasing risk. This finding underscores the need to pay increased attention to the types of caseworker efforts that result in increased perceived support among foster parents, particularly among youth with significant sexual abuse histories."
(Leon et al., 2008)	Sexual abuse – measured by self report scale developed by "the research team at CAUSES" Only 23% of the sample reported sexual abuse	Involved in clubs (Dichotomous yes /no. Foster parents asked "Is your youth involved in Clubs?")	13.2 yrs	Lower or stable sexually ruminative thoughts (Sexually ruminative thoughts scale)	Mean 1.5 yrs (SD 0.6 yrs post baseline) Range between T1 and T2 = 0.6 - 3.2 yrs	Stepwise regression	"The interaction of clubs and sexual abuse ($\beta=.19$, $p < .05$)"	"Youth with low levels of reported sexual abuse have a negligible mean level of sexually ruminative thoughts if they are involved in clubs. However, as sexual abuse history increases, sexual rumination increases significantly. This finding suggests that the greatest benefits of club involvement may be realized for youth without significant sexual abuse histories."

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Betancourt et al., 2010)	Being a child soldier; being raped, killing or injuring people during war	Community acceptance (Scale of community acceptance – six items)	15.1 – 21.8	Internalising problems (Oxford Measure of Psychological Adjustment)	21.8	Multilevel linear growth modelling	“levels of community acceptance were significantly and inversely associated with lower baseline levels of internalizing problems (b=1.21, p=0.003).”	
(Betancourt et al., 2010)	Being a child soldier; being raped, killing or injuring people during war	Community acceptance (Scale of community acceptance – six items)	15.1 – 21.8	Externalising problems (Oxford Measure of Psychological Adjustment)	21.8	Multilevel linear growth modelling	“increased community acceptance was associated with decreased externalizing problems (b= -1.09, p<0.001)”	
(Betancourt et al., 2010)	Being a child soldier; being raped, killing or injuring people during war	Community acceptance (Scale of community acceptance – six items)	15.1 – 21.8	Adaptive/prosocial behaviours (Oxford Measure of Psychological Adjustment)	21.8	Multilevel linear growth modelling	“increasing community acceptance (b= 1.93, p<0.001) was associated with increased prosocial/adaptive behaviors over time”	
(McVie, 2014)	Bullying perpetration (risk factor)	Low economic deprivation (using data from the 2001 census based on rates of unemployment, overcrowding, renting a home from the local	Unclear	Participation in violence (self-reported – participants asked whether they had committed any of five acts of violence)*	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on violence at age 17, controlling for low economic deprivation:	

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
		authority and single parent households)		* Not participating in violence is the resilient outcome – but the results are presented in the table according to predictability of participation in violence at age 17 – hence the negative effect sizes			B = -0.29, SE = 0.16, p < 0.05* * These are the stats reported in the table however the author states that “none of the resilience variables measuring affluence proved to be significant in the model”	
(McVie, 2014)	Bullying victimisation (a bully victim at age 13–16)	Low economic deprivation (using data from the 2001 census based on rates of unemployment, overcrowding, renting a home from the local authority and single parent households)	12	Psychological distress (reduced version of the Hospital Anxiety and Depression Scale (HADS))* * Low levels of psychological distress is the resilient outcome – but the results are presented in the table according to predictability of psychological distress at age 17 – hence the negative effect sizes	17	Logistic regression	The effect of early bullying perpetration at age 13–16 on psychological distress at age 17, controlling for low levels of economic deprivation: B = -0.26, SE = 0.13, p < 0.05 “Young people living in the least economically deprived areas of Edinburgh demonstrates a strong degree of resilience to later mental health problems”	

Appendix 9: Protective factors – Other factors

See Appendix 4 for a description of the information presented in the table below.

Author	Adversity/ Risk	Protective factor (measured by)	Age PF	Resilience outcome (measured by)	Age resilience	Statistical methods used	Findings:	Supplementary information
(Rennie & Dolan, 2010)	Incarceration	Total protective factor (Structured Assessment of Violence Risk in Youth (SAVRY) OTHER	16.14 (mean)	No re-offending (no new record on the police database)	12 months post- baseline	Logistic regression	Exponent of B = 0.01, p = 0.01 (95%CI [0.41, 0.88]) “The protective total factor score was a significant predictor of desistance [from offending]”	
(Rennie & Dolan, 2010)	Incarceration	Total protective factor (Structured Assessment of Violence Risk in Youth (SAVRY) OTHER	16.14 (mean)	No violent re-offending (no new record of violent offence on the police database)	12 months post- baseline	Logistic regression	Exponent of B = 0.72, p = 0.05 (95%CI [0.51, 1.00]) “Although none of the individual protective factors were predictive of [no violent reoffending], the total protective factor was a significant factor, but only just”	



Victorian Health Promotion Foundation
PO Box 154 Carlton South
Victoria 3053 Australia
T +61 3 9667 1333 F +61 3 9667 1375

vichealth@vichealth.vic.gov.au
vichealth.vic.gov.au
twitter.com/vichealth
facebook.com/vichealth

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