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**Bullying Victimisation and Alcohol-Misuse in adolescence  
Investigating the Functional Relationship and New Prevention Strategies**

Topper, Lauren

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**Author:** Lauren Rachel Topper

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# **Bullying Victimisation and Alcohol-Misuse in Adolescence: Investigating the Functional Relationship and New Prevention Strategies**

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**PhD THESIS**

Submitted for the degree of Doctor of Philosophy in Social, Genetic and Developmental  
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## **ABSTRACT**

This thesis aimed to examine the functional relationship between adolescent bullying victimisation and alcohol-misuse using two comorbidity models: a causal model and a common underlying mechanism model. This research had 4 main aims: 1) to investigate the risk conferred by adolescent bullying victimisation on alcohol-misuse, focusing on the role of coping-drinking motives; 2) to understand the risk conferred for victimisation from neurotic personality traits previously implicated in alcohol-misuse, whilst focusing on the role of emotional symptoms; 3) to compare the behavioural and neurological emotional vigilance of adolescents who have either experienced bullying victimisation or a severe trauma to non-victimised participants; 4) to investigate the effect over 18-months of personality-targeted coping-skills interventions on reducing victimisation, coping-drinking motives and alcohol-related problems in victims with high levels of neurotic personality traits. These objectives were addressed using data from three independent studies: The Preventure and Adventure studies which administered personality-targeted interventions for adolescents (aged 13-16 years) and the IMAGEN study. Evidence was provided for both comorbidity models. A causal comorbidity model was supported with results showing that bullying victimisation predicted future alcohol-misuse, a relationship mediated by coping-drinking motives. Two neurotic personality domains, which have been previously implicated in alcohol-misuse, predicted risk for victimisation, mediated by the development of emotional symptoms, therefore supporting a common mechanism model of comorbidity. Victims displayed a hypervigilance for fearful face stimuli, which was similar to trauma-exposed adolescents. A combined-victim group with a high level of emotional impact showed increased brain activation for angry and ambiguous faces. Within this group, emotional symptoms were positively associated with increased neural response to angry and ambiguous faces in areas including the anterior cingulate cortex. Finally, results suggest that personality-targeted interventions can reduce victimisation and increase positive coping strategies, in addition to reducing coping-drinking motives and alcohol-related problems specifically for victims of bullying.

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## **DECLARATION**

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Data collection for the Preventure study was conducted by Dr. Patricia Conrod and the Preventure team. I derived the bullying variable from this data. I was involved in data collection for the Adventure study alongside Dr. Patricia Conrod and the Adventure research team. With regards to the IMAGEN project, I was partly responsible for recruitment of schools and families for both the pilot and the main study, in addition to all aspects of data collection for both the pilot and main studies. I was involved in the training of other staff members from the European IMAGEN research centres to ensure standardisation across sites. I was responsible for the inclusion of the bullying questionnaire within the IMAGEN study.

I was responsible for generating all hypotheses and research questions in this thesis, conducting all statistical analyses and writing up the research for publication.

All work in this thesis is original and is my own work. This thesis has not been submitted for any other degree at any other university.

## **GENERAL INTRODUCTION**

### **Thesis outline**

This thesis aims to investigate the functional relationship between victimisation from bullying and alcohol-misuse within adolescence. Two models of comorbidity are explored: a) the causal model, which posits that victimisation should cause and predict the development of alcohol-related problems; b) the common underlying mechanism model, which stipulates that the two outcomes of victimisation and alcohol-misuse are influenced by a common factor. Within the context of this model, the role of personality vulnerability and emotional symptoms are explored.

Chapter 1 includes 2 main sections that initially outlines the background literature and then introduces the different methodologies included within this thesis which are believed to be novel to this thesis. Chapter 2 describes the general methodology used for the six empirical studies (Chapters 3 to 8). Chapters 3 and 4 explore the functional relationship between victimisation and alcohol-misuse using data from 2 longitudinal studies. Chapters 5 and 6 investigate emotional vigilance for victims of bullying in comparison to non-victim groups, using data from a large pan-European neuroimaging study of normal adolescents (IMAGEN). Chapters 7 and 8 assess the effect of personality-targeted interventions on both victimisation and alcohol-related problems. Chapters 3 and 4 present analyses which investigate two models of comorbidity: the causal model and the common mechanism model. Chapter 3 tested a causal model of comorbidity between adolescent bullying victimisation and alcohol-related problems over a 12 month period. These analyses looked at both direct and indirect pathways to alcohol-related problems through the development of a risky style of coping-drinking. Chapter 4 explores a common mechanism model for comorbidity. Analyses investigated whether ‘anxiety-sensitivity’ and ‘hopelessness’ personality domains, which have been shown to confer risk for substance-use, also predict risk for victimisation over an 18-month period. Analyses also investigated an indirect risk for victimisation through the development of emotional symptoms. Finally, Chapter 4 presents results that directly assessed the role of ‘hopelessness’ and ‘anxiety-sensitivity’ in the functional relationship between bullying victimisation and alcohol-misuse.

Chapters 5 and 6 present analyses which explored victims' vigilance for emotional face stimuli, at both a cognitive-behavioural and neural level. Chapter 5 assessed the cognitive vigilance for emotional threat of victims of bullying, and compared this vigilance to two groups of adolescents: those adolescents who have been exposed to a lifetime trauma; and a second control group who have experienced neither bullying victimisation, nor an extreme lifetime trauma. Chapter 6 presents the results of analyses which investigated whether a combined victim group also showed a neural hypervigilance for threatening emotional face stimuli.

Chapters 7 and 8 present results from a personality-targeted intervention programme, to assess whether this programme can effectively reduce bullying victimisation and alcohol-misuse in a subgroup of victims. Chapter 7 assessed the effect of this programme on levels of self-reported victimisation as well as coping strategies over an 18-month period. The effect of this intervention on bullying victimisation is replicated within an independent yet similar longitudinal study. Chapter 8 presents results on the effect of the same personality-targeted intervention on alcohol-related problems and coping-drinking motives for a subgroup of victims of bullying.

Finally, Chapter 9 provides a general discussion of the clinical implications of the results obtained from these studies, an integrative model of comorbidity, in addition to the limitations of these studies and future directions for work in this area.

### **Novel contributions to research field**

The work generated from this thesis that is believed to be original and contributes towards understanding the functional relationship between victimisation and alcohol-misuse in adolescence can be summarised as follows:

- Two models of comorbidity have been used to investigate mechanisms underlying the relationship between bullying victimisation and alcohol-misuse. Evidence has been accumulated throughout this thesis to support different aspects of the causal and common-mechanism models, with an integrative model presented in Chapter 9.

- Examining the risk for alcohol-related problems from bullying victimisation, mediated by the development of coping-drinking motives (Chapter 3).
- Examining the risk for victimisation from 2 neurotic personality domains previously implicated in the risk for alcohol-misuse, and replicating these results using data from an independent study (Chapter 4).
- Investigating and comparing the cognitive and neural emotional vigilance for victims of bullying to a group of trauma-exposed adolescents (Chapters 5 and 6).
- Assessing the effect of a personality-targeted intervention in reducing both levels of bullying victimisation (and replicating these results using data from an independent trial) (Chapter 7), as well as risky alcohol drinking styles for victims of bullying (Chapter 8).

## **Chapter 1a: THE FUNCTIONAL RELATIONSHIP BETWEEN BULLYING VICTIMISATION AND ALCOHOL-MISUSE – A REVIEW OF THE LITERATURE**

### **1.1 Victimisation from Bullying**

#### *1.1.1 Background to bullying*

Victimisation from bullying is recognised as a widespread, current problem for schools throughout Europe and North America (e.g. Nansel, Haynie, & Simons-Morton, 2003; Nansel, Craig, Overpeck, Saluja, & Ruan, 2004). However, recognition of bullying victimisation as a trauma experienced by many individuals within childhood and adolescence is relatively recent (see Olweus, 2009); research into the causes and consequences of victimisation from bullying began in the late 1960's and early 1970's in Sweden (Olweus, 1978).

Victimisation from bullying has been associated with sometimes severe and long term mental health consequences, which can persist beyond the experience of bullying (Arseneault, Bowes, & Shakoor, 2010). Subsequently, researchers, schools and policy makers have taken an interest in bullying as a risk factor for mental health problems within childhood and adolescence. For example, since 1999 all schools within the UK are required by law to implement an anti-bullying policy, which sets out the schools policies and active strategies for reactive (e.g. punishments and sanctions) as well as proactive (e.g. focus on bullying within the curriculum, development of an anti-bullying school ethos, etc) guidelines to combat bullying and it's often pervasive consequences (Hunter, Boyle, & Warden, 2006).

#### *1.1.2 Definition for bullying*

One of the main difficulties in researching the antecedents and consequences of bullying victimisation is the lack of consensus within the literature regarding a specific definition for bullying, or the frequency of victimisation required in order to categorise individuals as either victims or perpetrators of bullying. Many researchers and practitioners have accepted Olweus's (2000) guidelines for bullying, which outline three necessary criteria for actions to be perceived as bullying: intention, repetitiveness and an imbalance of power (see Smith & Brain, 2000). Olweus' definition for bullying is stated as: '*An individual is being bullied or victimised when he or she is exposed, repeatedly and over*



*time to negative actions, on the part of one or more other individuals. It is a negative action by which someone intentionally [causes] or attempts to [cause] harm or discomfort [to another person]'* in which there exists an imbalance of power between the victim and perpetrator (Olweus, 2000, pp. 487-489). These negative actions can be in the form of physical contact (hitting, kicking, spitting, etc), by words (calling names, teasing, embarrassing, etc) or through more indirect and less obvious ways (leaving someone out, spreading rumours about someone, etc). This definition of bullying emphasises the notion of an imbalance of power between the victim and the bully; in order for victimisation to be seen as bullying, the victims must find it hard to defend themselves (Olweus, 1999; 1993). This element is important as it distinguishes bullying from other forms of peer violence (Olweus, 2000; 2007). Additionally, this definition makes it clear that actions cannot be considered bullying if they are done in a friendly or playful way, or when two students of equal power or strength show aggression or violence towards one-another.

### *1.1.3 Measuring victimisation*

A further problem for consistency in bullying victimisation research are the various methods for measuring rates of victimisation, which can lead to inconsistencies between different studies (Wolke & Stanford, 1999). Three main methodologies have been identified within the literature: naturalistic observation of children in their daily interactions, which is perhaps more relevant for childhood rather than adolescent based bullying victimisation (Pepler & Craig, 1995); peer, parental or teacher nominations to identify students involved in bullying (e.g. Boivin & Hymel, 1997; Veenstra et al., 2007); and self report questionnaires in which students rate their own bullying experiences (e.g. Mynard & Joseph, 1997; Olweus, 2000; Olweus, 2007). The use of adult informants for bullying may be less appropriate for adolescent victimisation. Adolescence is a developmental period characterised by the transition away from family or adult-centred relationships towards peer-dominated social networks (Cairns, Leung, Buchanan, & Cairns, 1995); parents' knowledge about the private lives of their children may therefore decrease during adolescence. Teachers may be witness to overt forms of victimisation within the playground or classroom, however many acts of bullying will contain more subtle or secretive behaviours that may not be noticed by adults (e.g. Smith & Levan, 1995; Ladd & Kochenderfer-Ladd, 2002). Investigations into the use of different informants have shown an overall low level of agreement, suggesting that

different informants, whilst aware of specific aspects of bullying victimisation, are not exposed to a holistic view of the situation (Ronning et al., 2009; Wienke Totura, Green, Karver, & Gesten, 2009). Self reports are more straightforward to assess. However this method also has its limitations; some students may be reluctant to report painful or traumatic experiences, or they may be unable to recognise their own involvement in bullying (Ladd & Kochenderfer-Ladd, 2002; Salmivalli & Peets, 2009).

#### *1.1.4 Different forms of bullying*

Current understanding of bullying recognises many different forms, which include direct negative actions, such as physical and verbal actions, enacted within the context of face to face interactions (e.g. hitting, kicking or verbally threatening the victim) (Olweus, 1978; Smith, 2004). Indirect and relational actions are also recognised bullying behaviours (Crick, Casas, & Ku, 1999). Indirect bullying is thought to be aggression achieved via a third party, for which the perpetrator is not necessarily present or directly linked to the act. Relational bullying is any act which seeks to disrupt social relationships like exclusion or rumour mongering (Olweus, 1993; Crick et al., 1999).

Perpetrators of bullying are thought to value aggression as a suitable way to achieve power and control in social environments (Olweus, 1999; Salmon, James, Cassidy, & Javaloyes, 2000). The more traditional forms of direct and indirect bullying have been shown to take place at school, in locations and time periods for which there are clear social hierarchies in combination with low levels of adult supervision (e.g. in the school playground) (Salmon et al., 2000). Recent research into bullying has taken into account the growth of digital and internet based social networking. Accordingly, 'cyber-bullying' or digital bullying, acknowledges the role of technological advancements into bullying behaviour. This form of victimisation often involves devices such as mobile phones, the internet and internet-based social networking sites. Cyber-bullying allows for the pervasive targeting of victims beyond the physical or time constrained boundaries of school (e.g. Smith et al., 2008).

For many victims of bullying the school environment will remain important to their experience of victimisation, either due to it being the location within which the bullying occurs, or as the location through which the victimisation is initiated (i.e. amongst a peer group who belong to the same school). The school environment can therefore still

be seen as important even if the victimisation extends beyond school hours using technological ‘cyberbullying’ tactics. Further, with regards to the practicalities of research, schools are the setting in which most adolescents participate and into which researchers can gain easier access. Schools represent a microcosm of wider society, thereby creating a naturalistic setting for which to investigate the antecedents for victimisation as well as the associated consequences. Additionally, focus on the school environment allows investigations into the implementation and effectiveness of intervention programmes, which can reach the majority of those students involved in bullying. As such, due to the focus of this thesis to identify the antecedents and consequences of victimisation, as well as to evaluate the effectiveness of school-based intervention workshops, the following literature review will focus on school-based bullying victimisation, with research into cyber-bullying discussed as an important future direction within the discussion chapter of this thesis.

#### *1.1.5 Student roles within bullying*

Despite negative views on bullying (Rigby & Slee, 1991), bullying remains prevalent within the make-up of many schools. The majority of students have been shown to hold a role in the maintenance of bullying, either as victims, perpetrators or active bystanders (students who positively reinforce victimisation) (Salmivalli, Lagerspetz, Bjorkqvist, Österman, & Kaukiainen, 1996). There are 3 main groups involved directly within bullying: ‘pure’ victims (who do not report bullying other students); bullying-victims (who are victimised but also report bullying their peers); and perpetrators (who report no victimisation) (Salmivalli et al., 1996). Victims of bullying are consistently categorised as those students who have experienced victimisation at least 2 or 3 times per month, within a given period of time (this is classed as a ‘few months’ within the Olweus definition: Olweus, 2000; 2007). In a similar vein, those students who have bullied other students at least 2 or 3 times per month within a given period of time can be categorised as perpetrators of bullying. Those students who fit into definitions for both the victim and perpetrator categories are classified as provocative victims, or bullying-victims (Mynard & Joseph, 1997; Solberg & Olweus, 2003; Ivarsson, Broberg, Arvidsson, & Gillberg, 2005). This thesis will focus only on the antecedents and consequences for victimisation, and will not explore the risks for either bullying perpetration or a combination of the two.

#### *1.1.6 Rates of victimisation*

An average of 11% of students report at least weekly victimisation (Nansel et al, 2004; Nansel et al., 2001). However, a higher proportion of students (approximately 20%) are thought to suffer from occasional victimisation (Boulton & Underwood, 1992; Whitney & Smith, 1993). Rates of victimisation have been shown to decrease gradually throughout adolescence (Rigby, 2002; Smith, Madsen, & Moody, 1999; Pellegrini & Long, 2002). Developmental trajectories which have analysed rates of victimisation have shown that bullying occurs at all ages, but peaks during the middle-school years (Hazler, 1996; Rios-Ellis, Bellamy, & Shoji, 2000). In addition to changing rates of victimisation, the nature of victimisation also changes during development.

However, victimisation experiences can remain stable from childhood to adolescence. In a study by Scholte and colleagues (2007), 43 percent of students who reported victimisation aged 11 years old also reported victimisation aged 14 years old. Fifty-one percent of victims were shown to no longer be involved in victimisation after a 4 year period. Only 7 percent of participants who were uninvolved in bullying aged 11 years old became victims of bullying during adolescence. This study also investigated reasons underlying the different victimisation trajectories. Results showed that in comparison to childhood-only victims, students who experienced persistent victimisation from childhood to adolescence were more disliked by their peers, were shyer and had fewer friends. In contrast, childhood-only victims did not significantly differ from those students who had never experienced victimisation (Scholte et al., 2007). The results from this study suggest that upon entering adolescence, those individuals who remain victims are arguably the more severe cases, who may be most at risk from suffering adverse consequences.

#### *1.1.7 Victimisation in adolescence*

Adolescence is a developmental period marked by an increasing awareness for social status issues and is therefore a critical time point in which to examine both the causes and consequences of victimisation (Espelage & Swearer, 2003). Within this period, peers become increasingly influential (Steinberg & Morris, 2001), youth become more conscious of negative self perceptions and show discernible changes to their levels of self-esteem (Zimmerman, Copeland, Shope, & Dielman, 1997). Consequently, bullying victimisation experienced during adolescence threatens the formation of a positive self

perception (Vernberg, 1990). Further, adolescence is marked by cognitive and physical changes that create greater discrepancies in maturation, size and strength between students (see Harter, 1990; Champion, Vernberg, & Shipman, 2003). These pubertal changes may lead to differential forms of bullying and potentially more severe consequences; for example, the risk for physical harm increases during adolescence (Cairns, Cairns, Neckerman, Ferguson, & Gariepy, 1989; Champion et al., 2003).

Social isolation within adolescence marginalises victims from mainstream social groups and limits the peer-orientated support available (Crick et al., 2001), thereby precluding victims from learning the coping strategies available within their peer groups (Uchino, Cacioppo, & KiecoltGlaser, 1996). For this reason, victimisation may also impede the development of social competence skills, for example, the ability to effectively manage confrontation and maintain friendships (Champion et al., 2003). Those individuals who remain stable in their role as victims throughout adolescence may be those who are unable to learn the necessary coping strategies (e.g. Smith, Shu, & Madsen, 2001), and consequently may be at heightened risk for adverse long term consequences.

#### *1.1.8 Antecedents of victimisation*

The differential involvement rates of bullying between childhood and adolescence (e.g. Scholte et al., 2007) indicate that there may be specific characteristics to distinguish between childhood only victims of bullying and those for whom victimisation persists into adolescence. Understanding these individual differences is important in order to develop effective prevention programmes, which can diminish levels of victimisation, as well as limit the adverse consequences of victimisation. Victims have been shown to be a heterogeneous group, differing both in their individual characteristics as well as in their response to victimisation (e.g. Salmivalli et al., 1996; Bollmer, Harris, & Milich, 2006). Three common reactions to victimisation have been described: nonchalance, reactive-aggression, and displays of helplessness (e.g. crying; avoidance behaviours; inability to defend themselves) (Salmivalli et al., 1996). In a sample of 573 students aged 12 to 13 years old, from 11 Finnish schools, peers were asked to identify victims of bullying and to rate these students' responses to victimisation. For females, displaying signs of helplessness predicted the continuation of victimisation, whilst a lack of helplessness predicted a decrease in victimisation. The absence of nonchalance

and reactive-aggression predicted a decrease in victimisation scores for boys (Salmivalli et al., 1996).

Individual differences in aggressiveness, social isolation, prosocial behaviours and academic abilities have been associated with the risk for victimisation in pre-adolescence (Veenstra et al., 2005). Longitudinal studies have consistently shown that pre-existing internalising problems such as social withdrawal, anxiety and depression, increase the risk for victimisation (Hodges & Perry, 1999; Arseneault et al., 2006). The mechanism underlying this increased risk is however unclear; it is possible that individuals with higher levels of internalising symptoms send 'vulnerability' signals to potential perpetrators, and are consequently seen as easy targets. In a genetically sensitive design, using monozygotic twin pairs, Ball and colleagues (2008) attributed two thirds of the individual differences in bullying victimisation to genetic factors, suggesting that part of the risk for victimisation is heritable. However, this study also highlights that a third of the risk variance is caused by the environment. Accordingly, examining environmental influences on victimisation is important both due to its significant and independent impact on the risk for victimisation, in addition to being an important precursor in ascertaining relevant phenotypes for genetic analyses.

In their review of bullying victimisation, Arseneault and colleagues (2010) cite risk factors including those presented by family and home circumstances; such as maltreatment, domestic violence, parental depression and low socio-economic status (Shields & Cicchetti, 2001; Wolke, Woods, Stanford, & Schulz, 2001; Baldry, 2003; Beran & Violato, 2004; Bowes et al., 2009), as well as school factors; including size of school, overcrowding and receiving free school meals (Barnes, Belsky, Broomfield, Melhuish, & the NESS Research Team, 2006). Veenstra and colleagues (2005) showed that children's characteristics were predictive of victimisation, over and above family factors such as parental warmth, rejection and level of protectiveness. Taken together, this research indicates that individual characteristics are important in conferring risk for victimisation. Examining the cause of these individual differences, may be the key to understanding mechanisms of risk for victimisation.

#### *1.1.9 Association between personality and bullying victimisation*

One major cause for individual differences is personality. Personality has been defined as being the '*internal, organised ...characteristic of an individual over time and situation ... [with] motivation and adaptive significance*' (Watson, Clark, & Harkness, 1994: p.18). Whilst an individual's personality is thought to remain stable over time (and across developmental periods) (see Caspi, Roberts, & Shiner, 2005), the relationship between personality and behaviour is dynamic and changes over time (Caspi & Bem, 1990). Accordingly, an individual's personality may determine how that person will both interpret and respond to social situations, which could then infer risks for the reoccurrence of the event in the future. Victimisation has consistently been associated with higher levels of neuroticism, a personality domain characterised by traits of anxiety, depression, and self-consciousness (e.g. Slee & Rigby, 1993; Mynard & Joseph, 1997).

In a small cross-sectional study with 99 American children aged 10 to 13 years old, Bollmer and colleagues (2006) showed that personality traits mediated the affective and cognitive response to victimisation. Results showed that those children who scored high for neuroticism and low for conscientiousness were more likely to experience negative affect during peer conflict situations (they were angrier, less forgiving and attributed more blame to the bully). These negative reactions were in turn associated with higher levels of victimisation. Whilst this was a cross-sectional study and therefore no direction for causality can be inferred, this result is suggestive of the functional role that neurotic personality may play in the risk for victimisation. High levels of neuroticism may increase risk for victimisation (Tani, Greenman, Schneider, & Fregoso, 2003), due to the association between victimisation and difficulties in regulating negative emotions (e.g. Shields & Cicchetti, 2001).

#### *Summary of antecedents for victimisation*

Empirical evidence suggests that individual differences can help to explain the risk for either the initiation or continuation of victimisation experiences. Whilst no firm functional relationship is yet apparent within the literature, personality is strongly implicated in the risk for bullying victimisation, mainly through high levels of neuroticism. Current understanding of the direct role played by personality in the risk for victimisation is dependent mainly on cross-sectional studies, which are focused on

children or pre-adolescents. However, these studies indicate that personality may be involved in mechanisms of risk for victimisation and are therefore worthy of further investigation, particularly within studies that utilise adolescent samples and longitudinal designs.

#### *1.1.10 Consequences of victimisation*

Victimisation in childhood or adolescence has been perceived as an unpleasant, yet normative situation (see Tolan, 2004). However, empirical research into the consequences of bullying victimisation has shown that the experience can lead to both social and psychological problems, which can persist over time and lead to adult-onset psychiatric disorders (Kumpulainen, Raesaenen, & Puura, 2001). Victims report wide-ranging problems, including sleep disturbances, headaches and stomach-aches (e.g. Smith & Sharp, 1994; Williams, Chambers, Logan, & Robinson, 1996; Rigby, 1999). Longer term consequences from victimisation include psychotic-like experiences (e.g. Mackie, Castellanos-Ryan, & Conrod, 2010; Campbell & Morrison, 2007); increased levels of anxiety and depression, as well as lowered self esteem (e.g. Hawker & Boulton, 2000; Ivarsson et al., 2005). The severity of the problem is recognised within official governmental policy documents in the United Kingdom (e.g. Oliver & Candappa, 2003).

Bullying victimisation has been consistently been shown to increase the risk for subsequent internalising problems, including depression and anxiety (Craig, 1998; Hawker & Boulton, 2000; Kaltiala-Heino, Rimpela, Rantanen, & Rimpela, 2000; Bond, Carlin, Thomas, Rubin, & Patton, 2001; Nansel et al., 2001; Prinstein, Boergers, & Vernberg, 2001; Wolke et al., 2001; Karatzias, Power, & Swanson, 2002; Veenstra et al., 2005; Arseneault et al., 2006). In a recent meta-analysis of 18 longitudinal studies (ranging in length from six months to two years), Reijntjes and colleagues (2010) examined the relationship between victimisation and internalising problems in a combined sample of 13,978 children. Results showed a bi-directional relationship between victimisation and internalising problems. This demonstrates a cyclical risk for the stability of victimisation within childhood, with internalising problems predicting maintenance of victimisation status over time, as well as being an adverse consequence of victimisation experiences.



Bullying victimisation has been associated with adverse outcomes that can persist beyond the victimisation experiences (Kochenderfer & Ladd, 1996; Kochenderfer-Ladd & Wardrop, 2001; Hunter, Mora-Merchàn, & Ortega, 2004). Experiencing victimisation from bullying has been robustly linked to decreased levels of self esteem (e.g. Karatzias et al., 2002; Solberg & Olweus, 2003) and increased levels of loneliness (Eslea et al., 2004). Additionally, victimisation has also been associated with more severe mental health consequences, such as suicidal ideation (Roland, 2002; Herba et al., 2008; Klomek, Sourander, & Gould, 2010) and the risk for future psychotic symptoms (Bebbington et al., 2004; Janssen et al., 2004; Kelleher et al., 2008; Schreier et al., 2009; Mackie et al., 2010).

In addition to internalising mental health consequences, bullying victimisation has also been associated with the development of externalising behaviours, such as aggression, delinquency and alcohol or substance-misuse (e.g. Khatri, Kupersmidt, & Patterson, 2000; Tharp-Taylor, Haviland, & D'Amico, 2009). The externalising consequences of bullying victimisation have been less researched for pure-victims of bullying (i.e. those victims who do not also engage in bullying other students), in contrast to the well-documented research into the internalising consequences. Subsequently, little is known about the functional relationship between bullying victimisation and possible externalising behaviours including alcohol-misuse. The risk for inappropriate drinking behaviours and patterns is important to investigate within adolescence due to the association between alcohol-misuse and the development of alcohol use disorders, which are associated with both psychological and behavioural problems, including sexual promiscuity, suicide attempts, academic failure, unemployment and social isolation (Cooper, 1994; Kaminer, 1999; Clark, 2004)

One explanation for the association between victimisation and externalising behaviours is the influence of 'deviant' peers. Victims of bullying who are marginalised from mainstream peer groups (Dishion, Patterson, Stoolmiller, & Skinner, 1991) are at an increased risk for affiliating with deviant peer groups, who may be engaged in socially unacceptable behaviours, including alcohol-misuse. However, Laird and colleagues (2001), followed-up 400 participants over a 9 year period (from the age of 5 years through to 14 years old). Results showed that whilst childhood peer rejection predicted increases in deviant peer affiliation, peer rejection was the stronger predictor for future

externalising problems, over and above association with deviant peers. This result suggests that the experience of victimisation, rather than affiliation with other marginalised students, increases victims' externalising behaviours.

#### *1.1.11 Victimisation and coping strategies*

Externalising consequences may also be caused by the adoption of less adaptive coping strategies, such as avoidance coping strategies. The adoption of maladaptive coping strategies has been shown to increase the risk for repeated victimisation as well as other adverse consequences (Kochenderfer-Ladd & Skinner, 2002; Kochenderfer-Ladd, 2004; Kuntsche, Knibbe, Engels, & Gmel, 2007). Avoidant coping has been associated with internalising disorders such as depression and anxiety (e.g. Blalock & Joiner, 2000; Connor-Smith & Compas, 2002). One specific form of avoidant coping is engagement with alcohol or other substances (e.g. Camatta & Nagoshi, 1995). Due and colleagues (2007) investigated the association between adolescent victimisation and medicine use. Results showed that victims of bullying were significantly more likely to use pain medicine for headaches and sleep problems, in comparison to their uninvolved peers. Victims of bullying were between 40 to 70 percent more likely to consume headache pills than uninvolved adolescents. Medicine use amongst adolescents has been shown to co-occur with smoking and alcohol-use, emphasising that this coping mechanism for victimisation could be associated with the same behavioural pattern of misuse as substance and alcohol-misuse (Andersen, Holstein, & Hansen, 2006).

#### *1.1.12 Bullying Victimisation and alcohol-misuse*

Few studies however have investigated the influence that victimisation from bullying may have on the risk for problematic relationships with alcohol. There are many different terms in which to describe such relationships. This thesis will utilise the term 'alcohol-misuse' in order to infer a risky drinking style, which may not fulfil diagnostic criteria for alcohol abuse or alcohol-use disorders, but which could potentially augur risk for future drinking problems and dependency. The following section outlines a review of the literature, which sought to include the main articles published within the past ten years, which have directly examined this association (see Table 1.1 for an overview of the included studies). The six identified studies showed an interesting array of outcomes with respect to the relationship between bullying victimisation and alcohol-use. Four out of the six studies reported a significant and positive association

between bullying victimisation and an increase in alcohol-use (Kuntsche & Gmel, 2004; Sullivan, Farrell, & Klierer, 2006; Tharp-Taylor et al., 2009; Luk, Wang, & Simons-Morton, 2010).

Sullivan and colleagues (2006) recruited African American students, with a mean age of 14.5 years. Results showed that within the whole sample, relational victimisation (i.e. social exclusion and rumour mongering) modestly increased the frequency of both alcohol-use as well as being drunk' from alcohol-use. Additionally, male victims of physical bullying reported an increase in alcohol consumption and drinking to get drunk. No gender specific effects were shown for relational victimisation.

Tharp-Taylor and colleagues (2009) also show that physical and relational victimisation is associated with increased alcohol-use, this time in an ethnically diverse sample. However, in contrast to the findings of Sullivan and colleagues (2006), gender specific effects were shown only for girls (Tharp-Taylor study, 2009). These contrasting effects of gender between the 2 studies reflect the sensitivity of this relationship to study design, with methodological differences between these two studies seen in the average age, sample size, demographic constitution, and the sampling time-frame (see Table 1.1 for more information).

A third study conducted by Luk and colleagues (2010) examined gender differences in a sample of 1495 adolescents. Victimised boys reported an increased frequency 'substance-use', which included frequency of alcohol-use, drinking to get drunk, tobacco and marijuana use. For girls, heightened depression levels were shown to partially explain the relationship between victimisation and 'substance-use'. This result supports a previous study which showed that bullying victimisation was associated with solitary episodic drinking in girls, and that this association co-occurred with depression, lower general life satisfaction and lower self-esteem (Kuntsche & Gmel, 2004).

Two studies (which used the same dataset) demonstrated no significant relationship between bullying victimisation and an increase in frequency of alcohol-use (Nansel et al., 2001; Nansel et al., 2004). The results from these two cross-sectional studies, which benefited from large sample sizes (15,686 and 113,200, respectively) must be taken into

account when interpreting any risk posed by bullying victimisation upon the development of alcohol-use disorders.

### *Conclusions*

The few studies that have investigated the relationship between bullying victimisation and alcohol-use differed with regards to the type of bullying under investigation, the definition utilised for bullying, as well as in terms of the sample sizes, ages and ethnicity of participants recruited, further, only one study used a longitudinal design (Tharp-Taylor et al., 2009). Conclusions regarding the relationship between adolescent bullying victimisation and alcohol-use are therefore hindered by methodological differences between studies, which restrict the comparison of results. Bullying victimisation is a developmental phenomenon that changes during adolescence (see Smith et al., 1999). The lack of studies spanning a greater proportion of the adolescent period allows for only a snap-shot of knowledge into the association between adolescent bullying victimisation and alcohol-misuse. The state of the literature is therefore severely limited when trying to understand the externalising consequences of bullying victimisation with regards to an association with alcohol-misuse.

Most of these studies show a relationship between bullying victimisation and alcohol-use, therefore justifying the call for more research in this area. However, it is important to note that an increase in alcohol-use does not automatically imply a risk for alcohol-misuse. Therefore, research is needed to investigate the mechanisms underlying a functional relationship to understand why some victims of bullying engage in increased alcohol consumption and whether they are also at heightened risk for alcohol-misuse.

### **1.2 Trauma and alcohol-misuse**

Whilst the relationship between bullying victimisation and alcohol-misuse is not well investigated, there is little to no focus on understanding the mechanisms underlying this relationship. Examining models for comorbidity will allow some insight into why victims of bullying may engage with alcohol and therefore highlight potential mechanisms for intervention. Due to the paucity of studies which have focused on bullying victimisation and alcohol-misuse, this section will utilise evidence accumulated within the Post Traumatic Stress Disorder (PTSD) literature, which has established a strong functional association between exposure to trauma and alcohol-

misuse through the use of varying models of comorbidity (see Stewart, 1996; Stewart, Pihl, Conrod, & Dongier, 1998; Stewart & Conrod, 2003). This literature on PTSD will be used as a model for developing ideas regarding a the potential link between bullying victimisation and alcohol-use or misuse.

**Table 1.1 Studies associating bullying victimisation and alcohol-use**

<b>Authors</b>	<b>N</b>	<b>Mean Age</b>	<b>Country</b>	<b>Study Design</b>	<b>Findings</b>
Sullivan et al., 2006	276	14.50	United States	Cross-Sectional measuring outcomes retrospectively from past 30 days. Sample made up of African American students from 2 American public secondary schools	Physical bullying victimisation related to increased alcohol-use for boys, but not for girls
Tharp-Taylor et al., 2009	926	12.45	United States	Longitudinal: 2 time points over 10 months measuring victimisation retrospectively from the past 12-months and substance-use from the past 30 days	School-based bullying victimisation at time 1 (both mental and physical) predicted alcohol-use at 10 months (after controlling for previous alcohol-use). Gender differences shown for physical bullying victimisation rather than mental victimisation, with significant associations for girls rather than boys.
Nansel et al., 2001	15,686	(US grades: 6-10)	Data taken from the US 1998 HBSC survey	Cross-Sectional	Bullying victimisation (at school or away from school) was negatively associated with frequency of alcohol-use.
Nansel et al., 2004	113,200	(aged 11-15 years)	Sample recruited from public and private schools in 25 different countries	Cross-sectional	Bullying victimisation was not associated with frequency of alcohol-use.
Kuntsche and Gmel, 2004	3861	15.3	Switzerland	Cross-sectional	Bullying victimisation associated with solitary 'risky single occasion drinking' for females, co-occurring with increased depression, lower general life satisfaction and lower self-esteem.
Luk et al., 2010	1495	16.1	United States	Cross-sectional asking retrospectively for the past 'couple of months' and past 30 days for information on victimisation and substance-use, respectively.	Frequency of victimisation positively associated with substance-use (a latent variable including frequency of alcohol-use and drinking to get drunk as well as tobacco and marijuana for males). Indirect relationship between victimisation and SU through levels of depression for females.

### *1.2.1 Traumatic events and alcohol-misuse*

Exposure to traumatic events has been associated with increases in alcohol-use and related problems for both adults and adolescents. For example in a sample of 439 adults (aged 18 to 85 years old), exposure to the recent Katrina and Rita hurricanes in America was shown to influence a 2.5 fold increase in past year binge drinking, as well as an increased quantity of alcohol consumption on drinking occasions. The number of trauma related stressors experienced was positively related to past year alcohol consumption and binge drinking (Cerdeira, Tracy, & Galea, 2011). In a further example, the effects of exposure to the attacks on the World Trade Centre in New York in 2001 was investigated in a sample of 1618 adults over a two year period. Results showed that increased exposure to the disaster predicted greater alcohol consumption and dependence symptoms, after controlling for demographic information, exposure to other stressful events, and previous history of anti-social behaviour. Severity of trauma exposure increased binge drinking one year following the event; this effect disappeared two years later (Boscarino, Adams, & Galea, 2006).

Childhood and adolescent exposure to trauma and victimisation, including sexual and physical abuse and violent one-off peer victimisation, has also been associated with an increased risk for the development of alcohol-use disorders (e.g. Bensley, Spieker, Van Eenwyk, & Schoder, 1999; Kilpatrick et al., 2000; Kendler, Karkowski, Neale, & Prescott, 2000), problematic behaviours associated with alcohol-use (e.g. Cohen & Senger, 1982; Duncan, Saunders, Kilpatrick, Hanson, & Resnick, 1996) and an earlier initiation of alcohol-use (e.g. Swett, Cohen, Surrey, Compaine, & Chavez, 1991). Childhood trauma has been shown to precede alcohol-misuse (Clark, Lesnick, & Hegedus, 1997), a finding which suggests that the trauma may be a causal factor in the alcohol-misuse; temporal assumptions are necessary for determining causality (see Stewart & Conrod, 2003). Current and lifetime alcohol dependence were investigated across 13 years in an American sample who were five years old at baseline. Results showed that participants who had been exposed to a trauma were over 2 times more likely to report both lifetime and current alcohol dependence symptoms in comparison to non-exposed participants (Giaconia et al., 1995).

Swett and colleagues (1991) investigated the relationship between alcohol-use disorders and the experience of abuse in an adult sample of female clinical outpatients. Results

showed that between 24% and 85% of the women had been subject to some form of childhood abuse. Women who reported a history of sexual or physical abuse had higher levels of alcohol problems in comparison to non-abused women. Abuse experienced before the age of 18 (with no subsequent victimisation) was associated with higher levels of alcohol-misuse. These results suggest that the adverse effects of childhood abuse in relation to alcohol-misuse can persist into adulthood (Swett et al., 1991).

### *1.2.2 Exposure to trauma and age of alcohol-use initiation*

Victimisation and exposure to trauma have also been shown to lower the age of alcohol-use initiation (Rothman, Edwards, Heeren, & Hingson, 2008; Hamburger, Leeb, & Swahn, 2008). Earlier initiation of alcohol-use has been associated with an increased risk for alcohol-misuse (e.g. Treutlein et al., 2006). In a study which assessed 593 pre-adolescents (with an average age of 11.8 years), results showed that directly experiencing lower levels of violence were associated with a younger age of alcohol-use initiation. These results suggest that some forms of victimisation may deter children from engaging with alcohol, potentially as a protective factor against future violence or victimisation (Mrug & Windle, 2009).

In contrast to this study, a recent study by Waldrop and colleagues (2007) examined predictors for age of initiation of both alcohol-use and heaviest drinking episode. The sample consisted of adults who had experienced trauma either during their childhood, before the age of 18 (n=25) or during adulthood (n=33). The childhood group were shown to initiate alcohol-use almost two years earlier than the adulthood group. The age of heaviest drinking episode was shown to be seven years earlier for the childhood group in comparison to the adulthood group. Whilst this study utilised small sample sizes, and therefore requires replication before any firm conclusions can be drawn, these results highlight the specific risk of childhood trauma on alcohol-misuse.

Acts of victimisation by peers, which do not meet the criteria for bullying, have also been associated with earlier initiation of alcohol-use as well as the use of other substances. A cross-sectional study of seventh-grade students (n=856) in the United States, showed a significant association between pre-adolescent alcohol-use and dating violence. This result remained significant over and above other indicators of alcohol-



use such as the effects of peer delinquency, depression, impulsivity, binge drinking and other substance-use (Berenson, Wiemann, & McCombs, 2001).

#### *Summary of association between trauma and alcohol-misuse*

The literature above provides strong evidence to associate various forms of trauma with an increased risk for alcohol-misuse or problems. Some indication has been provided for a causal relationship, with exposure to trauma in childhood implicated in the earlier initiation of alcohol-use (e.g. Waldrop et al., 2010) and adulthood alcohol problems (e.g. Swett et al., 1991). The risk for the development of alcohol-misuse or dependence symptoms as a consequence of trauma may be moderated by individual differences, such as the way in which someone experiences extreme anxiety or distress. For example, Douglas and colleagues (2010) showed that in a sample of 2061 adults, childhood abuse or exposure to violent crime was significantly related to substance abuse. This relationship was partially explained by the diagnosis of either mood or anxiety disorders, which were present approximately three years prior to substance abuse diagnoses. Subsequently, it is necessary to examine the role that susceptibility to extreme distress plays within the relationship between trauma and alcohol-misuse (see Stewart, 1996).

#### *Definition for Post Traumatic Stress Disorder*

Post traumatic stress disorder (PTSD) can be thought of as a form of extreme anxiety or emotional distress (Stewart, 1996). It has been defined within the Diagnostic Statistical Manual (DSM-IV: APA, 1994) as a set of symptoms that may develop as a consequence of experiencing or witnessing an event which included actual or threatened serious injury, death, to the self or other people. Symptoms include: the re-experiencing of trauma (including intrusive thoughts, flashbacks and nightmares); avoidance of traumatic reminders; emotional numbing; and increased physiological arousal (including hypervigilance for threat, exaggerated startle response, diminished concentration, and sleep disturbance) (APA, 1994).

#### *1.2.3 The association between PTSD and alcohol-misuse*

The development of PTSD has been shown to interact with exposure to trauma to increase the risk for alcohol-misuse. For example, in response to criminal victimisation, adult women with symptoms of post-traumatic stress were 3.2 times more likely to

report alcohol-misuse in comparison to victims without PTSD symptoms. Further, victims with PTSD symptoms were 13.7 times more likely to report alcohol-misuse than non victims (Kilpatrick & Resnick, 1993). Accordingly, the development of emotional distress in response to a traumatic experience, rather than the trauma itself, increases the risk for alcohol-misuse.

This relationship has been shown in other trauma-exposed groups, including combat veterans (e.g. Streimer, Cosstick, & Tennant, 1985; Warshaw et al., 1993). McFall, Mackay, and Donovan (1992) showed no differences in alcohol abuse rates between combat exposed and non-exposed veterans. Within the combat exposed group, those with PTSD reported significantly higher levels of alcohol abuse than veterans without PTSD. Further, whilst alcohol abuse was significantly correlated with PTSD symptoms, no association was shown with severity of combat experience. Accordingly, the relationship between exposure to trauma and alcohol problems may be due to levels of emotional distress (i.e. PTSD), rather than the type or severity of trauma. However, contrasting results have been also been shown. Over a 10 year period, Breslau and colleagues (2003) found no direct relationship between exposure to an unspecified trauma and alcohol dependence either in the presence or absence of PTSD in a sample of young adults.

In other studies, PTSD symptoms in response to childhood trauma have been shown to play a mediating role in the development of adult-onset alcohol problems. Epstein and colleagues (1998) recruited a random non-clinical sample of adult women. Exposure to sexual abuse during childhood was related to a two-fold increase in adulthood alcohol dependence problems. Results showed that the relationship between childhood sexual abuse and alcohol problems was strongest for those women who developed comorbid PTSD; PTSD symptoms were shown to explain the relationship between childhood abuse and adult onset alcohol dependence. Similarly to the previous studies with combat veterans, these results highlight the importance of post-traumatic emotional distress in auguring risk for alcohol dependence (Epstein, Saunders, Kilpatrick, & Resnick, 1998).

Models of comorbidity can be used to understand the functional relationship between PTSD and alcohol-misuse. Three dominant and validated models for comorbidity will

be presented: causality, a common mechanism and mutual exacerbation. Due to the aforementioned paucity of research investigating the relationship between bullying victimisation and alcohol-misuse, these functional models for PTSD and alcohol-misuse will be used as a model for a potential functional relationship between bullying victimisation and alcohol-misuse, which will be the focus of this thesis.

### **1.3 A causal model for comorbidity**

The causal comorbidity model stipulates that one disorder causes a second disorder. Two assumptions for this model need to be adhered to when investigating the relationship between PTSD and alcohol-misuse. The ‘gradient of effect’ and temporality of association (see Stewart & Conrod, 2003). The gradient of effect assumption (see review by Chilcoat & Breslau, 1998) states that if PTSD and alcohol-misuse are causally related, then when the severity of PTSD symptoms increase, so should the severity of alcohol-misuse. Temporality indicates the direction of the association between the two comorbid disorders; the predicting problem should temporally precede the outcome disorder, i.e. PTSD symptoms should be experienced before the onset of alcohol-misuse problems.

#### *1.3.1 The Self Medication Hypothesis*

Causal comorbidity models for PTSD postulate that alcohol-misuse represents a ‘self medication’ process, which alleviates aversive physiological or psychological reactions to trauma (Khantzian, 1985). The self-medication hypothesis postulates that stressful events can alter cognitive, emotional and social processes that are fundamental to behaviour (Khantzian, 1985; Sinha, 2001). The experience of stress involves the perception and interpretation of a stimulus, followed by behavioural adaptation in response to harmful or threatening cues (Lazarus & Folkman, 1984). Situations which lead to experiences of fear or anxiety can result in aversive hyperarousal sensations (Cappell & Herman, 1972; Cappell & Greeley, 1987). In this respect, alcohol may be used to induce a physiological or psychological response, which can ‘self medicate’ or repress negative emotions and aversive hyperarousal symptoms.

Accordingly, the ‘self medication hypothesis’ suggests that alcohol consumption in response to stress reflects a need to alleviate post-traumatic emotional states (Stewart, 1996; Pfefferbaum & Doughty, 2001; Ullman, Filipas, Townsend, & Starzynski, 2005;

Boscarino et al; 2006; McFarlane & Van, 2009). Chutuape and de Wit (1995) outlined three assumptions for understanding the self medication hypothesis. Firstly, the emotional distress should precede the increase in alcohol consumption (thereby fitting into the causal model for comorbidity); secondly, the use of alcohol should alleviate the emotional symptoms; and finally, that the symptom relief will cause continued or excessive use of alcohol in response to future stressors.

However, investigations into causality, which have used either human or animal models, have shown inconsistent results (see Sinha, 2001). Exposure to stress has been shown to influence either increases in alcohol-use (Volpicelli & Ulm, 1990; Mastropaolo, Novitzki, & Deutsch, 1992; Pelham et al., 1997), decreases in alcohol-use (van Erp & Miczek, 2001); or the maintenance of pre-stress consumption levels (Higley, Hasert, Suomi, & Linnoila, 1991; Fidler & LoLordo, 1996).

In the short term, alcohol-use may alleviate any trauma related emotional distress due to its sedative effect on hyperarousal symptoms (Wills & Shiffman, 1985; Soderpalm & de Wit, 2002). The use of alcohol as an avoidance coping strategy may reflect difficulties adopting other more adaptive coping strategies (e.g. Moos, Brennan, Fondacaro, & Moos, 1990; Abrams & Niaura, 1987). Additionally, alcohol consumption has been shown to prime an increased use of future alcohol-use and alcohol related behaviours (Rose & Duka, 2006). Consequently, in the longer term, the adoption of self-medicating alcohol-use may increase the risk for this behaviour to become an automatic response to future trauma or dysphoric mood (Carey & Carey, 1995; Stewart, 1996; Stewart et al., 1998; Stewart, Conrod, Pihl, & Dongier, 1999). Accordingly, the use of alcohol in order to self-medicate has been associated with longer term poorer health outcomes, as well as problematic levels of alcohol-use and dependence symptoms (Cooper, Russell, Skinner, Frone, & Mudar, 1992; Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001).

PTSD hyperarousal symptoms have been implicated in functional relationship between trauma and alcohol-misuse. In a sample of 295 women substance-users, PTSD hyperarousal symptoms were related to an increase in the severity of alcohol problems (Stewart et al., 1999). This replicates findings from a previous study by McFall and colleagues (1992), which also showed that alcohol problems were unrelated to

emotional numbing symptoms. Consequently, the relationship between stress and levels of alcohol-misuse may be explained specifically by the development of hyperarousal symptoms. Whilst no causal direction can be inferred from these cross-sectional studies, this association between the symptoms of arousal and alcohol-misuse provides support for the self medication hypothesis, which stipulates that alcohol is utilised in order to dampen these stress related symptoms.

#### *Summary of the Self Medication Hypothesis*

The self medication hypothesis stipulates that exposure to stressful or traumatic situations may result in aversive symptoms of hyperarousal which will ultimately increase the risk for alcohol-misuse. However, the review of the self medication literature showed an inconsistency in results. This inconsistency may reflect the involvement of other moderating factors, such as levels of pre-stress alcohol consumption and differences in experimental stress paradigms (e.g. van Erp & Miczek, 2001). Alternatively, individual differences in available coping resources may make certain individuals more susceptible to the behavioural adaptations described by the self-medication hypothesis, and therefore at increased risk for the development of alcohol-misuse (Kushner, Abrams, Thuras, Thuras, & Hanson, 2000).

#### *1.3.2 Temporal association between PTSD and alcohol-misuse*

Support for a causal comorbidity model between trauma and alcohol-misuse is provided in a critical review of the literature, which emphasises the temporal nature of this relationship (Stewart, 1996). This review concludes that the experience of emotional distress (i.e. PTSD) from trauma precedes the development of alcohol-misuse. In an attempt to understand the temporal relationship between trauma and alcohol-misuse, North and colleagues (2011) combined descriptive data collected from 697 survivors of 10 separate disasters, with an average age of 46 years at the time of trauma exposure. Nineteen percent of survivors reported alcohol-use disorders, however, only 0.3 percent of these cases were developed post trauma. In comparison to survivors without alcohol problems, those survivors who reported post-traumatic alcohol problems were four times more likely to consume alcohol to cope with negative emotions. As shown by previous studies (e.g. McFall et al., 1992), this result shows that exposure to trauma does not always predict alcohol-misuse. However, alcohol problems which result from trauma are associated with avoidance coping strategies (North et al., 2011).

Retrospective studies with combat veterans have shown that PTSD symptoms precede alcohol problems (e.g. Mellman, Randolph, Brawman-Mintzer, Flores, & Milanes, 1992). Bremner and colleagues (1996) investigated the association between PTSD and substance-use dependence symptoms in a sample of 61 male combat veterans. PTSD symptoms were shown to develop near to the time of combat exposure. Substance-use dependence symptoms emerged around the same time as PTSD arousal symptoms, with evidence of a gradient of effect: the increase in severity of PTSD symptoms paralleled the severity of substance-use (Bremner et al, 1996). This study provides further support for self medicating alcohol-use to alleviate arousal symptoms (Stewart et al., 1998).

Chilcoat and Breslau (1998) conducted a longitudinal study over the course of 3 to 5 years on a randomly selected sample of 21 to 30 year olds (n=955 at follow-up). Baseline PTSD symptoms predicted the development of a substance-use disorder at the follow-up. Contrastingly, the existence of a substance-use disorder at baseline did not predict risk for either future victimisation or the development of PTSD symptoms at follow-up. These results support a causal relationship, with PTSD symptoms influencing the development for substance-use problems, without evidence for the inverse.

Much of the literature above focuses on the effect of PTSD in the relationship between trauma and alcohol-misuse for adult populations. Exposure to trauma during adolescence has also been associated with the development of PTSD and alcohol-misuse. For example, Clark and colleagues (2003) showed that PTSD diagnoses were more common in adolescents who presented with an alcohol-use disorder (AUD) in addition to a history of childhood abuse. Childhood abuse was shown to precede alcohol problems and was associated with an earlier age of AUD onset. In contrast, structured clinical interviews conducted with American adolescents showed that exposure to various forms of trauma (including physical or sexual assault and witnessing violence) were associated with an increased risk for alcohol abuse, over and above familial substance-use problems and demographic factors. However, PTSD symptoms were not implicated in this relationship (Kilpatrick et al., 2000).

Blumenthal and colleagues (2008) conducted a critical review of the literature to examine the relationship between adolescent trauma, post traumatic stress and alcohol-misuse. Fifteen studies were identified. All but two studies showed that trauma exposure predicted increased alcohol consumption. Evidence for a gradient effect was shown with exposure to multiple traumas predicting higher levels of future alcohol-use. In contrast to these conclusions, McFarlane and Van Hooff (2009) examined the 20-year outcome effects of experiencing an Australian bushfire in a sample of 1011 adults (mean age at the time of the fire was 8.44 years old). Exposed adults were compared to a matched non-exposed control group. Results showed that a higher proportion of bushfire survivors met diagnostic criteria for 'an anxiety disorder' (without meeting criteria for PTSD). However, no differences in levels of alcohol misuse were found between those participants who had experienced the fire and the non-exposed control group (McFarlane and Van Hooff, 2009).

#### *Summary of the temporal association between PTSD and alcohol-misuse*

This section provided evidence to suggest that not everyone exposed to trauma will adopt maladaptive avoidance coping strategies; however, those who do are at risk for poorer health outcomes in addition to alcohol-misuse problems. In examining the temporal association between PTSD and alcohol problems, evidence suggests that trauma alone does not necessarily predict alcohol problems: the experience of extreme distress (i.e. PTSD) as a consequence of the trauma may mediate this relationship. The role of emotional distress (or PTSD) supports the notion that individual differences and coping strategies may be an important factor in the functional relationship between trauma and alcohol-misuse.

#### *1.3.3 Cognitive-behavioural models of self-medication*

The self medication hypothesis postulates that alcohol is used as a coping strategy to alleviate a hyperarousal response to stress. In order to understand the implications of using alcohol in this manner, it is important to understand how this maladaptive form of coping fits within the wider coping model. Coping has been defined as the combination of cognitive and behavioural processes that are utilised in order to contend with external and internal demands (Lazarus and Folkman, 1984). Coping is goal directed and flexible according to the demands of the stressor; it includes situational and volitional attempts to regulate the environment or individual response to the environment

(Compas et al., 2001). Importantly, in order for coping strategies to be implemented by an individual, situational stressors should be perceived to be challenging, or to exceed an individual's personal resources (Lazarus & Folkman, 1984).

Whilst there are different opinions regarding specific coping strategies, Gross (1998) identified three main approaches: a) problem focused coping: the use of cognitive and behavioural resources to solve the problem. Strategies include cognitive restructuring (viewing the problem in a different light), focusing on alternative methods to achieve a goal and direct action to prevent the source of the stress; b) emotion focused coping: controlling any stressor related emotional distress. This strategy does not attempt to change the source of the stress; c) avoidance coping strategies: the use of cognitive and behavioural strategies to avoid acknowledgement of the stressful event, including denial, or increased alcohol-use. This coping strategy does not attempt to resolve either the associated negative emotions or the source of the stress.

With respect to a causal comorbidity model between trauma and alcohol-misuse, evidence described previously has implicated PTSD arousal symptoms in the development and maintenance of alcohol-misuse through an avoidant, self medicating engagement with alcohol. Inconsistencies within the literature suggest that other factors may also be important in the relationship between PTSD and alcohol-misuse. As such, the following section will briefly overview relevant literature on genetic association studies, neural stress pathways, as well as the role of emotion regulation and cognition upon exposure to stress or trauma, in order to better understand the causal model of comorbidity between trauma and alcohol problems.

#### *1.3.4 Neurological response to trauma or stress*

Biological stress responses which result from trauma can be used to understand better the causal comorbidity model between trauma and alcohol-misuse. The experience of extreme stress can lead to behavioural changes, by influencing a dysregulation of biological stress response systems, such as the Hypothalamic-Pituitary-Adrenal (HPA) axis (Tsigos & Chrousos, 2002; Tarullo & Gunnar, 2006; Sinha, 2008). Prolonged stress can cause a loss of neurons in cognitively important brain regions (e.g. the hippocampus) (McEwen, Gould, & Sakai, 1992). 'Developmental traumatology' outlines the impact that severe childhood or adolescent stress has upon psychiatric and



neurological outcomes (DeBellis, 2001; DeBellis, 2002). Adolescence is a time period characterised by brain development (Blakemore, 2008; Gogtay et al., 2004). Accordingly, behavioural or cognitive changes during this developmental period may adversely affect future brain development and increase the vulnerability for subsequent mental health problems, including the onset of alcohol-use disorders (DeBellis, 2002). However, the initiation of alcohol-use behaviours may further impede cognitive abilities, as alcohol-use has been shown to impair cognitive functions including impulsivity, or thinking time, and working memory (Weissenborn & Duka, 2003), effects which may exacerbate the problems associated with trauma and victimisation.

Neurobiological stress response systems cause immediate reactions to stress by adapting levels of physiological arousal (DeBellis, 2002); which is implicated in the functional relationship between PTSD and alcohol-misuse (e.g. Stewart et al., 1999). Prolonged or extreme stress can cause changes to the stress response systems, which can persist into adulthood (e.g. Heim et al., 2000; Heim, Newport, Bonsall, Miller, & Nemeroff, 2001) and impact cognitive development, emotional regulation and brain maturation (DeBellis et al., 1999; Tarullo & Gunnar, 2006). Social threat has also been implicated in the stress response literature. In a meta-analysis of 208 studies which used laboratory manipulated stress paradigms, Dickerson, Gruenewald and Kemeny (2004) showed that social-evaluative threat predicted higher levels of stress response (in the form of cortisol release). Tasks which included elements of uncontrollability (participants would not succeed even with maximum effort) were associated with a 3-fold increase in levels of cortisol released. This result suggests that social stressors can influence an over-activation of stress-response systems, in a similar manner to other more ‘traditional’ traumas, such as abuse.

#### *1.3.5 Brain regions implicated in stress response*

The stress response process is reliant on information received by brain regions involved in the sensory nervous system (such as the thalamus and insula) (LeDoux, 1992; Phan, Wager, Taylor, & Liberzon, 2002), as well as areas included in the ‘limbic system’ (implicated in the regulation of affective states), such as the amygdala (e.g. Young, Scannell, Burns, & Blakemore, 1994; Adolphs, 2001). Nelson and colleagues (2005) outline the ‘social brain network’, which incorporates a circuit of brain regions, including the medial prefrontal cortex, the anterior cingulate, the amygdala and the

insula that are thought to work together in order to detect, categorise and regulate response to social stimuli. The amygdala is important for cognitive functioning due to its interactions with prefrontal cortex areas, such as the orbitofrontal cortex (Ochsner & Gross, 2005; Ochsner & Gross, 2007), that are implicated in goal initiation and response, as well as ascribing meaning and significance to situations (Nelson et al., 2005; Frith, 2007). The amygdala is thought to play a pivotal role in emotional learning and neural response to affective stimuli, in particular those involving fear (LeDoux, 1996; Maren, 2001; Dalgleish, Dunn, & Mobbs, 2009).

The insula is thought to underlie conscious emotional perception (e.g. Carlson, Greenberg, Rubin, & Mujica-Parodi, 2011) and has been implicated within both the anticipation (e.g. Shin et al., 2000), as well as direct experience of aversive or threat related social stimuli (e.g. Masten et al., 2009). It is thought that the insula acts as a neural alert system for threat in order to guide the formation of an appropriate behavioural response (Phan et al., 2002). The anterior cingulate cortex has been implicated in the regulation of physiological responses to emotion and stress; including increased heart rate, blood pressure and pupil size (Critchley, Mathias, & Dolan, 2001). The anterior cingulate is in direct communication with prefrontal regions in order to regulate the behavioural response to aversive stimuli (Bush, Luu, & Posner, 2000; Carter & van Veen, 2007). In response to threat related stimuli, the thalamus projects information to the amygdala, via areas of the limbic region, including the insula, prefrontal cortex and anterior cingulate (Charney, 2004). Information that is fed from the thalamus to the amygdala and frontal brain regions is thought to influence the immediate implementation of appropriate avoidance or defence responses (Gaffan, Murray, & Fabre-Thorpe, 1993; Lovallo, 1997).

#### *1.3.6 Genetic evidence for a causal comorbidity model*

Molecular genetics can also be used to assess a causal comorbidity model between trauma and alcohol-misuse. The CRHR<sub>1</sub> gene has been implicated in biological stress response systems, through its connection to the corticotrophin releasing hormone (CRH) (see Schepis, Rao, Yadav, & Adinoff, 2011). CRH is distributed in brain regions important to the stress response, including the frontal cortex, hippocampus, and the amygdala (Bale & Vale, 2004). Exposure to stress has been shown to effect the

expression of CRHR<sub>1</sub> within these brain regions (in particular the hippocampus) in animal models (Klenerova, Sery, & Hynie, 2008; Greetfeld et al., 2009).

Using a sample of 280 adolescents, Blomeyer and colleagues (2008) investigated the genetic influence on the association between stressful life events (within a three year period) and alcohol-use, using two ‘Single Nucleotide Polymorphisms’ (SNPs: or genetic markers) from the CRHR<sub>1</sub> gene. Results showed that in response to stressful life events, adolescents homozygous for the C genotype (the allele make-up of the individual, i.e. CC) on the SNP rs1876831, reported increased levels of lifetime binge drinking and quantity of alcohol consumed per drinking occasion. Additionally, a greater number of stressors predicted a younger age of alcohol-use initiation only for those adolescents with the ‘CC’ genotype (Schmid et al., 2010). Contrastingly, adolescents with the TT genotype for the same SNP, did not engage in problematic alcohol-use upon exposure to negative life events (Blomeyer et al., 2008).

A further study implicated the CRHR<sub>1</sub> gene in the relationship between trauma and alcohol-misuse. Results showed that the H<sub>1</sub> haplotype (combination of alleles) of the CRHR<sub>1</sub> gene (which included the same SNP rs1876831), predicted risk for alcohol-misuse in participants who had experienced childhood sexual abuse. Those participants who had experienced childhood sexual abuse, but had the H<sub>2</sub> haplotype were ‘protected’ and showed no increased risk for alcohol-misuse (Nelson et al., 2010). Accordingly, genetics has been shown to moderate the functional relationship between trauma and alcohol-misuse. These studies provide support for a causal comorbidity model and may help to explain inconsistencies within in the literature with respect to the association between trauma, PTSD and alcohol-misuse.

#### *Summary of the role of biological mechanisms*

Developmental traumatology (see DeBellis, 2001; 2002) highlights the importance of biological systems in the response to trauma. Chronic or severe stress or trauma can cause dysregulation to these systems, leading to symptoms of hyperarousal. This supports previous postulations within this review that trauma or stress experienced during adolescence will increase the risk for alcohol-misuse as a coping strategy for hyperarousal. Molecular genetic studies lend further support for the causal comorbidity model, by implicating individual differences at the biological level and providing a

possible explanation for inconsistencies within the literature regarding the association between trauma and alcohol-misuse.

### *1.3.7 Conclusion for the causal model of comorbidity*

The self medication hypothesis has been used to argue in favour of a causal comorbidity model between trauma (specifically PTSD) and alcohol-misuse. The trauma literature was used as a model due to a paucity of studies focusing on the relationship between bullying victimisation and alcohol-misuse. Evidence accumulated justifies calls for further research which focuses specifically on the trauma of bullying victimisation and its risk for alcohol use and misuse. However, inconsistencies in the literature, suggest that the self medication theory may not wholly account for the mechanisms involved in the relationship between trauma and alcohol-misuse. Individual differences within this relationship were demonstrated on a biological level. Individual differences were also alluded to regarding the levels of emotional distress experienced from trauma, as well in the development of avoidant coping strategies. As such, rather than a causal functional relationship existing between stress and alcohol problems, it may be that a common factor underlies the relationship, which would predict risk for both the source of the stress (i.e. bullying victimisation), as well as the stress response (i.e. alcohol-misuse). The next section will therefore outline the second comorbidity model investigated within this thesis: the common mechanism model, and again use the PTSD literature as a potential model for bullying victimisation.

## **1.4. A common mechanism model of comorbidity**

### *1.4.1 The role of personality in the risk for alcohol-misuse*

The ‘common mechanism’ model suggests that rather than a direct functional relationship existing between bullying victimisation and alcohol-misuse, other factors are involved in the risk for both victimisation as well as the development of alcohol-misuse. This review has already provided evidence to suggest that neurotic personality traits can increase the risk for bullying victimisation (e.g. Bollmer et al., 2006; Tani et al., 2003), however similar traits have also been independently associated with alcohol-misuse (e.g. Woicik, Stewart, Pihl, & Conrod, 2009). Theorists in the 1950’s suggested that personality and alcohol-misuse were intrinsically linked, with an ‘addictive personality’ explaining vulnerability for alcohol-use disorders (Sutherland & Schroeder, 1950). Contemporary research suggests that no singular personality domain can

reliably and consistently be shown to increase risk for alcohol-misuse (Sher & Trull, 1994; Cooper, Frone, Russell, & Mudar, 1995). Current understanding widely accepts a five factor model of personality (e.g. Costa & McCrae, 1992). The ‘five-factor’ (NEO-PI-R) model of personality consists of neuroticism (e.g. anxiety, depression, and self-consciousness), extraversion (e.g. warmth, assertiveness, and sensation seeking), agreeableness (e.g. compliance, modesty, and altruism), conscientiousness (e.g. competence, achievement striving, and self discipline), and openness to experience (e.g. openness to fantasy and to new ideas).

Specific personality traits have been shown differentially to increase vulnerability for adolescent alcohol-misuse (Laucht, Becker, Blomeyer, & Schmidt, 2007). Sher and Trull (1994) conceptualised different ways in which personality traits influence alcohol-misuse. Firstly, individual traits can heighten sensitivity for the pharmacological properties of alcohol, thereby enhancing alcohol’s negative reinforcing. Secondly, personality is implicated in affect regulation, increasing the motivation for ‘self medicating’ drinking styles for certain people. Personality can therefore be perceived as an important factor underlying the development of alcohol-misuse. The following section will focus on the role of neurotic personality traits and their role in the development of emotion regulation and coping strategies. The role of personality is hypothesised to pertain towards a common mechanism comorbidity model, creating simultaneous risk for bullying victimisation and self-medication influenced alcohol-misuse.

#### *1.4.2 The role of neuroticism in the common mechanism model of comorbidity*

Neurotic personality traits have been associated with increased negative affect, negative rumination, self-consciousness and self-doubt, as well as hypersensitivity to criticism and heightened emotional and physiological arousal to stress (Costa & McCrae, 1980; McCrae & John, 1992; Miles & Hempel, 2003). Neurotic traits may therefore increase emotional distress experienced from stressful situations (Bolger & Zuckerman, 1995). For this reason, neuroticism has been implicated in the adoption of avoidant coping strategies; neurotic individuals may be motivated to engage in behaviours such as excessive alcohol-use in order to avoid or dampen their heightened levels of negative emotions (see Cooper et al., 1995). Neuroticism has also been associated with shyness and social phobia (Heiser, Turner, & Beidel, 2003). With respect to bullying

victimisation, neurotic traits may therefore influence coping strategies, such as social avoidance, which will cause social isolation and potentially increase the risk for a continuation of the victimisation.

Neuroticism has been implicated within the ‘Behavioural Inhibition System’ (BIS), which is a neurological motivation system (Gray, 1990). The BIS is thought to drive the experience of negative emotions and to regulate behavioural response in order to divert attention away from aversive situations, therefore influencing avoidance behaviours (Gray, 1990). Individuals who utilise BIS processes have been shown to be more reactive to negative stimuli (Carver & White, 1994). These individuals may therefore be at heightened risk for displaying socially inappropriate behaviours, and engaging in avoidance behaviours, including alcohol-use and social avoidance.

Empirical studies have associated neuroticism with alcohol-misuse (e.g. Martin & Sher, 1994). In a sample of adult alcoholics, neuroticism was shown to be associated with increased heavy drinking after the experience of either conflict or negative emotions (Cannon et al., 1992). Neuroticism is however a broad personality domain that encompasses multiple processes including negative affect, behavioural inhibition and anxiety (Barlow, 2000). Neurotic symptoms have been shown to structure hierarchically around mood and anxiety symptoms, with negative affect and fear accounting for unique variance (Clark & Watson, 1991).

#### *Hopelessness and Anxiety-Sensitivity*

Subsequently, specific traits within the neuroticism domain may independently confer risk for both victimisation and alcohol-misuse. Hopelessness and anxiety-sensitivity are examples of two dimensions included within the broader neuroticism domain (Woicik et al., 2009; Castellanos-Ryan & Conrod, in press). Hopelessness is associated with elements of personality that measure depression. The experience of hopelessness contributes towards alcohol-use influenced by negative reinforcement motivations (e.g. Stewart & Devine, 2000). Depressive personality traits have been shown to influence drinking, specifically as a coping strategy in response to stress (Peirce, Frone, Russell, & Cooper, 1994; Carpenter & Hasin, 1998).

Anxiety-sensitivity has been described as the fear of anxiety-related physiological sensations, due to an ungrounded belief that they may lead to ‘catastrophic’ consequences. For example, people high in anxiety-sensitivity may misinterpret a fast heart beat as the start of a heart attack (Reiss, Peterson, Gursky, & McNally, 1986; Peterson & Reiss, 1992). High levels of anxiety-sensitivity act as an ‘arousal-accelerating factor’, which increases vulnerability for experiencing contextually inappropriate levels of arousal to everyday stressors (Reiss, 1991; Stewart & Kushner, 2001). Anxiety-sensitivity is thought to influence alcohol-use in order to reduce symptoms of hyperarousal (Stewart, Peterson, & Pihl, 1995; Stewart & Zeitlin, 1995; Stewart, Karp, Pihl, & Peterson, 1997; Conrod, Pihl, & Vassileva, 1998; Comeau, Stewart, & Loba, 2001). With regards to victimisation, high levels of anxiety-sensitivity increases the vulnerability for extreme levels of emotional distress and the development of conditioned fear responses following exposure to trauma (Taylor, Koch, & McNally, 1992). Subsequently, anxiety-sensitive victims of bullying may be hypervigilant for threat and exhibit contextually inappropriate behaviours during social interactions; these inappropriate responses may increase the risk for future victimisation.

Higher levels of anxiety-sensitivity have been associated with alcohol dependence (Stewart, Samoluk, & MacDonald, 1999). Stewart and colleagues (1992) assessed the effect of alcohol on response to threatening stimuli. Results showed that when sober, highly anxiety-sensitive students demonstrated a bias towards threatening words. This threat bias was eliminated upon the administration of a moderate dose of alcohol (Stewart, Achille, Dubois-Nguyen, & Pihl, 1992). This result was replicated in an independent sample, showing that alcohol, in comparison to a placebo drink, decreased threat bias for anxiety-sensitive students (Stewart, Achille, & Pihl, 1993).

#### *Conclusion of relationship between personality and alcohol-misuse*

Whilst there is empirical support for the association between neuroticism with alcohol-misuse, there are also reports which show no causal role for neuroticism (see Sher, Trull, Bartholow, & Vieth, 1999). The association between neurotic personality traits and alcohol-misuse may therefore be influenced by other moderating factors, which may be more proximal to the onset of problems (Cooper, Agocha, & Sheldon, 2000). Motivational factors for alcohol-use can help to explain the relationship between

personality and alcohol-misuse. Whilst personality traits are likely to remain stable across development (Roberts, Caspi, & Moffitt, 2001), potential mediating factors such as coping style are more likely to be situation specific and therefore be a suitable target for intervention efforts.

#### *1.4.3 The association between neurotic personality and coping strategies*

Neurotic personality traits are associated with avoidance coping strategies, such as increased alcohol-use, through the activation of motivational push factors (Stewart, Loughlin, & Rhyno, 2001). Specifically, neurotic individuals may be motivated to utilise alcohol in order to cope with high levels of negative emotions (see Cooper et al., 1995). Specific traits within neuroticism, such as self-doubt, alienation and negative rumination (Costa, Jr. et al., 1980; Cooper et al., 1995; Comeau et al., 2001), have been implicated in the development of avoidant drinking styles through an ‘affect regulation’ process. Similar personality traits have been associated with an increased vulnerability for victimisation (e.g. Bollmer et al., 2006) and social avoidance coping strategies (Slee, 1994), which could serve to prolong the victimisation. Neurotic personality and avoidance coping strategies are therefore implicated in both bullying victimisation and alcohol-misuse, supporting a common mechanism comorbidity model.

Connor-Smith and Flachsbart (2007) conducted a meta-analysis of 2653 effect sizes, taken from 165 studies (n=33,094), to assess the relationship between the ‘big 5’ personality domains and coping strategies. Results showed that extraversion and conscientiousness predicted problem solving coping and cognitive restructuring, whereas neuroticism predicted emotion-focused and withdrawal coping (neuroticism also predicted support seeking). Specifically, neuroticism was positively associated with all measured disengagement strategies (including wishful thinking, withdrawal, avoidance and denial), as well as to distraction strategies, and was negatively related to problem solving and cognitive restructuring strategies. Further, neuroticism was the only personality trait that was positively related to alcohol-use coping strategies.

The results from this meta-analysis suggest that the relationship between neurotic personality and coping strategies is stronger for individuals who are younger, report increased stress and utilise dispositional, rather than situation-specific coping (Connor-Smith and Flachsbart, 2007). Subsequently, adolescent victims of bullying who show



high levels of neuroticism may be at heightened risk for adopting coping strategies, such as social avoidance, behavioural disengagement, and self medicating alcohol-use. The results from this large meta-analysis suggest that personality domains show specific and independent relationships to different coping strategies. Subsequently, traits within the broad neuroticism domain (such as anxiety-sensitivity and hopelessness) may also show differential relationships with coping strategies.

#### *1.4.4 Neurotic personality traits, drinking motivations and alcohol-misuse*

The literature reviewed so far has provided evidence to suggest that neurotic personality characteristics may affect alcohol-misuse by influencing the development of avoidant coping-drinking motivations. Coping motives for drinking have been associated with emotion focused strategies, including avoidance and denial (Cooper, Russell, & George, 1988), and underlie the relationship between neurotic personality traits and alcohol-misuse (Cooper et al., 2000). Further, coping-drinking motives directly predict the development of alcohol-related problems in adolescent drinkers (Kuntsche et al., 2007).

Drinking behaviour has been defined as multiple and distinct behaviours explained by different underlying motivations (e.g. Cooper, 1994; Cooper et al., 1995). Accordingly, motivations for drinking can help to explain why some individuals who engage in avoidant drinking will develop alcohol-related problems, whilst others may not. Cooper and colleagues (1992) investigated coping strategies for adult drinkers using a laboratory stress paradigm (n=1316). Results showed that in response to stress, avoidant coping strategies and positive drinking expectancies were related to higher levels of alcohol-use and related problems for men.

Those people who drink alcohol in order to achieve an internal change of state (i.e. emotion-focused coping), have been shown to be at greater risk for alcohol-misuse, in comparison to those who drink for external motives (i.e. to conform to social pressures) (Cooper, 1994; Stewart & Devine, 2000). Personality domains have been shown to predict behaviour via distinct motivational pathways. Cooper and colleagues (2000) investigated the effect of personality on motivations for risky behaviours over a 4 year period, in a sample of young adults (n=1666) aged 18 to 25 years old. Results showed that neurotic and extraverted personality traits, predicted distinct behaviours including alcohol-misuse and risky sex, respectively. These behaviours were accounted for by

distinct motivational pathways. Neurotic participants were at increased risk for alcohol-misuse due to the adoption of coping-drinking motives. In contrast, extraverted participants were more likely to engage in risky sexual behaviours in order to enhance positive affect.

In a sample of adolescents aged 13 to 19 years old, Cooper (1995) investigated independent risk pathways for alcohol-misuse from coping and enhancement drinking motives. The results, which were replicated in an adult sample, showed that coping-drinking motives, predicted by increased negative emotions, directly predicted alcohol-related problems over and above alcohol consumption levels. Moderation analyses showed that high levels of negative emotions in conjunction with avoidance coping predicted higher levels of coping-drinking. With respect to personality, enhancement drinking motives mediated the relationship between impulsivity and drinking, whilst coping motives mediated the relationship between neuroticism and alcohol-use. These results suggest that a high degree of specificity exists in the relationship between personality and drinking motives; neurotic individuals show increased risk for avoidant coping-drinking motives.

This study by Cooper also highlighted the important role of negative emotions in auguring risk for avoidant coping strategies. In a similar manner, both avoidant coping strategies and the experience of negative emotions can be perceived to be factors which increase risk for both victimisation (initiation or continuation) as well as the development of alcohol-misuse, suggesting the existence of a common mechanism model for comorbidity.

#### *1.4.5 The role of emotion and emotion regulation*

This review so far has provided evidence to suggest that exposure to prolonged or severe stress can have deleterious effects on cognition through neural changes to biological stress response systems (e.g. DeBellis, 2002). Cognitive abilities effect individuals' appraisals of stressful experiences and therefore influence emotion regulation. Difficulties in regulating negative emotions such fear and anger have been shown to influence the development of contextually inappropriate behaviours (e.g. Eisenberg, Fabes, Guthrie, & Reiser, 2000). With respect to bullying victimisation, the interplay between cognitive and emotional processes may further increase the risk for

avoidant coping strategies, such as alcohol-use, in order to reduce negative affect. However this strategic use of alcohol may further exacerbate victims' behavioural problems, with evidence suggesting that alcohol consumption inhibits individual's control of their behaviour in response to external cues, even when these behaviours are directly associated with negative consequences (Loeber & Duka, 2009).

The regulation of emotions has been implicated in the risk for bullying victimisation. Whilst displays of positive emotions can benefit social encounters and have been linked to a reduction in childhood victimisation (Hanish et al., 2004), negative displays of emotion have been associated with increased levels of victimisation over time (Kochenderfer & Ladd, 1997; Wilton, Craig, & Pepler, 2000). Children are likely to attempt to control public displays of emotion within social contexts (Zeman & Garber, 1996). Those children who display higher levels of emotion and are unable to regulate these emotions whilst in a public environment are at increased risk for problems, including isolation and rejection (Eisenberg et al., 2000). Inappropriate behaviours which are demonstrated as a consequence of negative emotions may influence an increased and prolonged experience of bullying victimisation (e.g. Shields et al., 2001).

As much of the published literature seems to focus on children or pre-adolescents, less is known about the relationship between victimisation and emotion regulation for adolescents. In a 10-month prospective study, 1655 Korean adolescents were assessed at two-time points. Social and emotional problems at baseline predicted victimisation after 10-months, only when baseline bullying was not accounted for. In contrast, victimisation predicted future emotional problems at 10 months, over and above baseline problems (Kim, Leventhal, Koh, Hubbard, & Boyce, 2006). The results from this study suggest that emotional problems are a consequence of victimisation, rather than being the risk factor inferred above from the studies using children. However, this study used two-wave data and therefore it is not possible to draw strong causal inferences, as it is unclear how the emergence of new symptoms would impact on future victimisation.

### *Emotion regulation*

In order to understand the role that emotions play in the functional relationship between bullying victimisation and alcohol-misuse, it is necessary to understand the role that

emotions fulfil within social interactions. Emotions provide information about others' mental states, behaviours and intentions (Fridlund, 1994; Lemerise & Arsenio, 2000), and therefore fulfil an important communicative role (Ekman, 1993). The basis for emotional reactivity is thought to be biologically determined, yet influenced by previous personal experiences (Malatesta, 1990; Denham, 1998). Subsequently, whilst emotions can aid social interactions, severe or chronic stressors may distort emotion regulation and result in disruptive or prolonged emotional states. This will consequently increase the risk for inappropriate behaviours or the risk for psychopathology (Malatesta & Wilson, 1988).

Individual differences are apparent within emotion expression, largely due to differences in temperament and personality, as well as the intensity and regulation of emotions experienced. The expression of emotions has important social consequences, with the ability to alter interpersonal interactions (Keltner & Kring, 1998). The manner in which individuals experience and express emotions determines levels of social competence (Eisenberg & Fabes, 1992), and is therefore important within peer interactions and the risk for bullying victimisation. Emotional regulation is described as a multifaceted process that enables individuals to choose specific emotions under different contexts. The manner in which each emotion is expressed changes over time and involves a number of automatic and controlled stages (Gross, 1998).

Bidirectional associations between limbic brain regions (e.g. the amygdala and hippocampus) and frontal cortical regions (e.g. the orbitofrontal cortex), influence the generation of emotions, the application of contextual meaning and subsequent regulation processes (LeDoux, 1987; Mega & Cummings, 1994). These same brain regions, which are implicated in the neural response to trauma, have been shown to increase risk for alcohol-misuse (see DeBellis 2001; 2002). Empirical evidence for emotional regulation indicates that people with lesions to the prefrontal cortex show poorer emotion regulatory abilities and consequently tend to be more emotionally impulsive (Kolb & Taylor, 1990; Rolls, Hornak, Wade, & McGrath, 1994; Tucker, Luu, & Pfibram, 1995). With regards to victimisation and alcohol-misuse, it is this emotional impulsivity which may cause the display of inappropriate behaviours, which may increase the risk for both outcomes.

Gross's (1998) emotion regulation model can help to understand the manner in which emotions can influence social situations. At the initial 'situation selection' stage individuals decide to either approach or avoid specific people, places or stimuli. At this stage, short term benefits are balanced against longer term costs. This is exemplified in anxiety-sensitive individuals, who may avoid social situations to prevent distress, which inadvertently increases risk for longer term social isolation. Following this, individuals may attempt to modify the situation in order to change any associated emotional impact. This stage involves similar processes to coping strategies (e.g. Lazarus and Folkman, 1984), and is therefore influenced by individual differences such as personality. Strategies to modify the emotional impact of situations include diverting attention through techniques such as distraction (Nix, Watson, Pyszczynski, & Greenberg, 1995); concentrating on other tasks (Erber & Tesser, 1992); or actively attending to negative emotions. Individuals then ascribe meaning to a situation, and apply cognitive changes where necessary. Cognitive changes include internal defence mechanisms such as denial and cognitive reframing, which allow failure of one goal to be perceived as the successful attainment of a different goal (Carver, Lawrence, & Scheier, 1996). Finally, responses are modulated using behavioural strategies, such as the use of alcohol or social avoidance, in order to change or dampen the effect of negative emotions generated from a stressful event (Gross, 1998). The use of avoidance behaviours, such as alcohol, has both direct and indirect short and long-term consequences for subsequent emotion regulation, by in the short term reducing somatic tension and restricting attention to stressful stimuli (Steele & Josephs, 1990) and in the long term increasing arousal and reducing one's ability to learn non-substance-related coping strategies.

Poor regulatory abilities, which may be exacerbated by previously stressful experiences, can interfere with the processing of novel social situations (Arsenio & Lover, 1997). This interference can result in pre-emptive processing; preventing the flexible memory recall required for successful interpretation, thereby influencing inappropriate response behaviours (Lemerise et al., 2000; Rosen, Milich, & Harris, 2007). High levels of negative emotion in combination with poor emotion regulation skills predict poorer social functioning, the development of problematic behaviours and decreased peer acceptance (Eisenberg et al., 1992; Eisenberg et al., 1996). Subsequently the experience of negative emotions, as well as the ability of the individual to regulate these emotions

may be integral to the development of both adolescent bullying victimisation and avoidant alcohol-use; thereby supporting a common mechanism model for comorbidity.

### **1.5 The exacerbation model of comorbidity**

An alternative model which may explain a functional relationship between adolescent bullying victimisation and alcohol-misuse is the exacerbation comorbidity model. This model postulates that the two outcomes (i.e. victimisation and alcohol-misuse) co-occur and simultaneously enhance any negative consequences, thereby influencing a ‘vicious cycle’ for associated problems (see Stewart & Conrod, 2003; Stewart, 1996). Due to the paucity of studies investigating the association between bullying victimisation and alcohol-misuse, research which has investigated an exacerbation comorbidity model between PTSD and alcohol-use will be briefly presented, with appropriate parallels to victimisation highlighted.

Brown, Stout and Gannon-Rowley (1998) investigated the extent to which PTSD and substance-misuse symptoms were associated in 42 substance-misuse treatment patients. Results showed evidence for symptom exacerbation between the two disorders. Seventy-seven percent of patients reported that substance-misuse symptoms became worse simultaneous to a decline in PTSD symptoms; substance-misuse improved simultaneously to PTSD symptoms for 79 percent of patients. On the converse, PTSD symptoms increased simultaneous to increases in for 51 percent of patients; PTSD symptoms improved simultaneous to improvements in substance-misuse for 52 percent of the sample. In an earlier study, Brown, Stout and Mueller (1996) examined the effect of substance-misuse treatment in patients with and without PTSD. Results showed that PTSD symptoms exacerbated substance-misuse and interfered with recovery. Patients who were comorbid for both PTSD and substance-misuse were shown to relapse faster, report more drinking days and greater alcohol-use in comparison to patients without PTSD (Brown et al., 1996).

Treatment outcomes were assessed for three groups of patients diagnosed with substance-misuse only; substance-misuse comorbid with PTSD; or substance-misuse comorbid with a different psychopathology. Results showed that 1 year post-treatment, all groups showed similar levels of change to their substance-use severity. However, patients comorbid for substance-misuse and PTSD showed higher levels of

psychological distress at discharge and were more likely to be readmitted for treatment (Ouimette, Ahrens, Moos, & Finney, 1998). After two-years, the group comorbid for PTSD and substance-misuse reported increased severity of substance-misuse symptoms. This group showed less change in comparison to the other 2 groups on measures of psychosocial outcomes (e.g. social support, employment status and legal troubles). This difference was maintained when patients with other psychopathologies were removed from the analyses showing this effect to be specific to the comorbid PTSD and substance-misuse group. Emotion regulatory abilities were shown to explain worse psychological outcomes for comorbid substance-misuse and PTSD patients (Ouimette, Finney, & Moos, 1999).

Stewart and Conrod (2003) postulate that poor emotion regulation may explain the exacerbation of symptoms in comorbid PTSD and substance-misuse patients through an increased venting or rumination of negative emotions. With respect to victimisation, an inability to regulate emotions may lead to an inappropriate behavioural response within social interactions, simultaneous to an increased risk for avoidant drinking as a coping strategy. Both of these behavioural outcomes can feed into a 'vicious cycle' of comorbidity that would influence an exacerbation of symptoms for both outcomes.

### **1.6 Social Information Processing**

The previous section outlined 3 comorbidity models which may explain a functional relationship between bullying victimisation and alcohol-misuse. Due to the paucity of research that has associated these outcomes, parallels were drawn from the well documented relationship between PTSD and alcohol-misuse. However, there are features of bullying victimisation which may be unique from PTSD, and which may lead to a different causal or functional relationship between bullying victimisation and alcohol-misuse from that which could be understood from the PTSD literature.

Whilst there are apparent similarities between bullying victimisation and PTSD, there are also unique aspects to both. PTSD is an extreme emotional reaction to traumatic exposure, whereas victimisation itself is the traumatic exposure. Consequently, in order to be comparable, adverse emotional symptoms would need to be experienced as a consequence of victimisation. A further difference is that PTSD is related to trauma, which has included actual or threatened physical harm, or fear of death. In comparison,

bullying victimisation can be physical in nature, and has been associated with suicidal ideation (e.g. Klomek et al., 2010), yet it does not necessitate physical threat. In contrast to traumatic experiences, bullying requires prolonged negative actions over a period of time, and may therefore present more risk for the social integrity of the victim, rather than an immediate risk for physical integrity (e.g. Kumpulainen et al., 2001).

Social isolation can lead to loneliness (e.g. Eslea et al., 2004), however it can also impact victims' behaviour within future social interactions. Crick and Dodge's (1994) model of 'Social Information Processing' (SIP) can be used to explain how bullying may change victims' processing and interpretation of external social cues. The model interlinks cognition and emotion, with emotions influencing levels of arousal and guiding either the approach or avoidance of social stimuli. The SIP model postulates that the appraisal and subsequent reaction to social situations is influenced by a 'database' of memories from previous experiences, as well as biologically determined traits. The social processing steps involved in each encounter occur automatically and in parallel to various feedback loops. The stages involved within the model include: encoding, interpretation, goal clarification and response decision. The encoding stage is the point at which stimuli are acknowledged and either attended to or avoided (Dodge, 1991).

During the interpretation stage, stimuli are compared to memories from the 'database'. Meaning is then ascribed to the stimulus and specific goals are established with regards to behavioural response. Default interpretations are used for familiar stimuli, therefore saving time and cognitive energy. During the goal clarification stage, individuals use previously acquired contextual information in order to decide whether to continue or to adapt current behaviours. At this stage, specific goals are either internal (e.g. maintaining an emotional state) or external (e.g. avoiding conflict with another peer) (see Lemerise and Arsenio, 2000). Lemerise and Arsenio (2000) have revised Crick and Dodge's (1994) model to acknowledge the role of emotions and emotion regulation on SIP. Emotions can energise goal selection under specific contexts, which can provoke further changes to affective states.

Chronic victimisation may impact upon SIP by creating victim 'schemas', through which victims will interpret social situations (Rosen et al., 2007). Relational schemas



are cognitive structures that develop from repeated experiences, and shape expectations for future social interactions (Baldwin, 1992). Schemas can inform and guide automatic social processing by influencing selective attention, attribution styles and emotional arousal. A schema becomes increasingly accessible and automatic for a greater variety of situations, upon repeated activation and reinforcement (Greenwald & Farnham, 2000; Newman & McKinney, 2002). The generation of a negative internal schema, leads to all future social cues being interpreted in relation to that schema (Rosen et al., 2007). Consequently, 'victim schemas', which are developed in response to prolonged victimisation, will increase the risk for hyper-vigilance and an over-interpretation of threat (Rosen et al., 2007). These cognitive changes with respect to threat may impact subsequent processes such as emotion regulation, biological stress response and the coping strategy utilised. Internal schemas which cause inappropriate threat evaluations are more likely to induce negative emotions, and may therefore cause victims of bullying to engage in maladaptive coping strategies, such as increased alcohol-use.

Emotional processing was investigated in pre-adolescent victims of school-bullying (n=87), aged 9 to 13 years old (Rosen et al., 2007). Results showed that chronic victims who reported greater emotional symptoms reacted faster to stimuli which included victim salient information. These results suggest that this group of victims had internalised their experiences to create automatic victim schemas, which were activated in the presence of threatening cues (Rosen et al., 2007). This cognitive strategy may incur adverse social ramifications, leading to expectations for victimisation within peer-interactions, and causing the demonstration of subsequent defensive behaviours that befit threat, such as submission, reactive aggression and avoidance (e.g. Greenwald & Farnham, 2000; Greenwald et al., 2002; Bollmer et al., 2006). These behaviours may increase the risk for prolonged victimisation and the associated adverse consequences (see Eisenberg et al, 2000; Hanish et al., 2004).

### **1.7 Conclusions for a functional comorbidity model**

This thesis will assess the functional relationship between victimisation and alcohol-misuse, through the examination of two models of comorbidity: the causal model and the common mechanism model. The justification for the relevance for both of these models has been established mainly through a review of the literature focusing on PTSD. Whilst there are similarities between the consequences for PTSD and bullying

victimisation and how these may similarly affect alcohol-misuse, there are also differences. These differences may infer the role of alternative processes within the relationship between victimisation and alcohol-misuse. Subsequently, investigations into these 2 models of comorbidity must also acknowledge alternative pathways, which although potentially independent to the stated models of comorbidity, are not necessary mutually exclusive.

## **Chapter 1b: INTRODUCTION TO METHODOLOGIES**

In order to gain an in-depth understanding into the functional relationship between bullying victimisation and alcohol-misuse, this thesis will incorporate a number of different methodologies, including self report questionnaires, cognitive and neural emotional reactivity tasks, as well as intervention strategies. Due to the novel nature of some of these techniques for examining victimisation, included below is a summary for the cognitive, neural and intervention methods. The self-report methodology is well established within the literature for assessing victimisation and its effects, and whilst some new measures are being used with respect to bullying victimisation, these will be outlined further within Chapter 2 of this thesis.

### **1.8 Experimental cognitive literature**

The causation comorbidity model posits that victims of bullying will increase their consumption of alcohol in order to self medicate against hyperarousal symptoms; a purported consequence of severe or prolonged stress. Within this thesis, this comorbidity model will be examined using two experimental tasks to separately assess cognitive and neural activation patterns in response to emotional stimuli. The use of such tasks specifically for victims of bullying is rare within the literature. These studies will therefore represent an initial step towards ascertaining whether victims of bullying show elevated levels of emotional hyperarousal, as has already been identified for victims of other forms of violence or trauma.

As described previously, cognitive abilities affect the way that victims of bullying are able to appraise and cope with their experiences. Prolonged or severe victimisation may cause deleterious effects by impacting cognitive functioning (DeBellis, 2001). This can lead to greater difficulties in regulating responses to external fear and anger cues

(Eisenberg, 2000). Specifically, prolonged victimisation may necessitate ongoing attention to threat, which could either influence victims to engage in distraction (i.e. decreasing attention to threat cues), hypervigilance (i.e. increasing attention to threat cues), or the adoption of avoidance coping strategies, such as increased alcohol-use (DePrince, Weinzierl, & Combs, 2009).

#### *1.8.1 Cognitive perception and categorisation of emotional stimuli*

The perception of environmental cues is thought to be a cyclical process, which involves the integration of new information with previously acquired cognitive representations (or schemata), followed by the formation of behavioural goals (Neisser, 1976). Perceptual ‘categories’ group together similar objects and situations in order to reduce the complexity of social interactions. Perceptual grouping allows expectations of meaning and intent to be formed regarding novel cues (Niedenthal, Halberstadt, & Innes-Ker, 1999), with minimal cognitive effort (Brosch, Pourtois, & Sander, 2010). The processing of novel stimuli is shaped by automatic associations which are made between the novel stimulus and an internal ‘category’ of previously experienced, similar stimuli (Harnad, 2005). Accordingly, the salience of stimuli will differ depending on an individual’s previous experiences (e.g. Crick & Dodge, 1994); different people will approach the same cue with differential approach or avoidance behaviours (Brosch et al., 2010). For example, anxious adults have been shown cognitively to differ to non-anxious adults in response to emotionally threatening cues (Mathews & MacLeod, 1985; MacLeod, Mathews, & Tata, 1986).

Cognitive categories facilitate behavioural response to social situations by allowing for the rapid discrimination between emotions and emotional facial expressions (Bornstein & Korda, 1984). People are able to perceive discrete emotions within facial expressions, even when the emotions are presented along a continuum that has been mixed between two emotions (Etcoff & Magee, 1992; Calder, Young, Perrett, Etcoff, & Rowland, 1996; Young et al., 1997); this is an ability which should help behavioural response in novel social situations. The recognition and categorisation of facial emotions requires previous experience with that emotion in conjunction with learned expectations (Pollak & Sinha, 2002). The frequency of previous exposure to an emotion influences the ease and accuracy of emotion categorisation. For example, the

boundaries between different emotional categories have been shown to differ depending on how familiar participants are with the presented face (Beale & Keil, 1995).

The importance of previous experience for the discrimination of emotional stimuli has been shown in studies which investigate childhood maltreatment. Maltreatment exposes children to a range of unique emotional cues, which act to differentiate these children from their peers. Maltreated children have been shown to experience fewer positive emotional cues (Bugental, Blue, & Lewis, 1990), in addition to a greater number of negative emotional cues (Herrenkohl, Herrenkohl, Egolf, & Wu, 1991). As a consequence, maltreated children are more likely to categorise emotions as negative and have been shown to attend more to negative facial expressions (Pollak & Kistler, 2002; Pollak & Tolley-Schell, 2003). Masten and colleagues (2008) investigated the processing of emotional facial expressions in a group of 29 maltreated children (aged 8 to 15 years old), who exhibited high levels of post-traumatic stress symptoms. In comparison to a control group (n=17), maltreated children were faster in labelling fearful emotions and in identifying fearful faces, suggesting that maltreated children are hypervigilant for threat related emotional cues. This differential emotion processing in maltreated children may be due to the development of internal schemata for threatening emotions which effect the expectations derived from such emotions.

### *1.8.2 Facial paradigm tasks*

Effective interactions in social situations and interpersonal communications rely somewhat on the perception of non-verbal emotional cues, which can be accurately and consistently ascribed to other people through the use of facial expressions (Ekman, 1993; Kanwisher, McDermott, & Chun, 1997; Elfenbein & Ambady, 2002; Palermo & Rhodes, 2007). From an early stage in development individuals become skilled at recognising and understanding behavioural intent from other people's faces (Nelson, 1987; Morton & Johnson, 1991). The recognition of emotions from facial cues has been shown to develop continually throughout childhood and adolescence (Thomas, DeBellis, Graham, & LaBar, 2007). As such, this process could be affected by exposure to adverse social experiences within adolescence. It is therefore possible that bullying victimisation could impact emotional processing in a similar manner to that shown by maltreated children (e.g. Pollak & Kistler, 2002; Masten et al., 2008).

Facial paradigm tasks are thought to be the most reliable method to investigate the cognitive effects of victimisation on emotion processing, as they show high levels of ecological validity in comparison to tasks which use stimuli such as words (Ohman, 1996). Alternative methods such as dot-probe tasks and emotional stroop tasks utilise emotionally evocative stimuli in order to examine distraction from an instructed task. Such experimental paradigms have been used to assess attentional bias in groups with high levels of anxiety; these methods have produced inconsistent findings (see Vasey & MacLeod, 2001).

The advantage of facial paradigm tasks over dot-probe or stroop tasks, is that faces represent ‘real-life’ cues which are used in every-day social interactions and which provide a constant source of information regarding other people’s reactions and behavioural intent. With regards to threatening facial cues, angry and fearful faces are both considered to be distressing emotional stimuli that reflect equal levels of negative emotion and arousal (Johnsen, Thayer, & Hugdahl, 1995). Angry faces represent imminent threat, whilst providing information about the source of the threat (Whalen, 1998). Contrastingly, fearful faces are more ambiguous and whilst they suggest the presence of a threat, they do not provide information about the location of the threat (Whalen et al., 2001),

### *1.8.3 The effect of situational context on emotion perception*

When investigating emotional vigilance, it is important to take the social context into account. In real world settings, victims of bullying are required to interpret peer interactions under different contexts, whether this is their own emotional state, or the external social situation. Differences in situational contexts are thought to affect the perception and categorisation of emotions, with recognition of facial expressions dependent on the social context provided to the participant. For example, an angry face will be perceived as fearful if the participant is informed that this person has just been in a frightening situation (e.g. Kim, Somerville, Johnstone, Alexander, & Whalen, 2003; Kim et al., 2004).

Visual search paradigms are often used within research to assess emotional recognition within different ‘contexts’. In these tasks, participants have to search for a target emotional face amongst a matrix of emotional distracter faces (e.g. Fox et al., 2000;

Horstmann, 2007). Results from this method indicate a faster detection for threatening social cues (i.e. angry rather than happy faces) (e.g. Eastwood, Smilek, & Merikle, 2001; Williams, Moss, Bradshaw, & Mattingley, 2005). However, the validity of this measure to assess emotional reactivity and threat vigilance has been questioned due to inconsistent findings (e.g. Brosch, Sander, Pourtois, & Scherer, 2008), with suggestions that this method taps into a faster detection for emotional stimuli in general, rather than a specific and unique vigilance for threat (Frischen, Eastwood, & Smilek, 2008).

Most importantly, visual search paradigms fail to capture the complexity of social interactions which may often involve different emotional contexts and not necessarily 'pure' emotions of anger, fear, happiness or sadness (Carroll & Russell, 1997). Emotional facial expressions are often subtle (Matsumoto et al., 2002) and include a mixture of different emotions, like those used in experimental paradigms (e.g. Townshend & Duka, 2003). Subsequently, whilst visual search paradigms attempt to take context into account, the use of prototypical emotional expressions fails to reflect real-life exposure to emotion within social interactions.

Exposure to mixed emotional expressions increases within social situations during adolescence (van Beek, van Dolderen, & van der Duijn, 2006), with increased regulation of behaviour influencing the suppression, masking or faking of true emotions, which increases displays of ambiguous emotion (see van Beek & Dubas, 2008). An alternative method which can take both context and ambiguity of emotion into account is the morphed faces task. This method allows an examination into threat vigilance using facial expressions which are mixed between two emotions along a continuum. A morphed faces task developed by Pollak and Kistler (2002) assesses emotional vigilance for target emotions in the context of different distracter (i.e. prime) emotions, through the presentation of photographs with faces that are morphed between two emotions: happy to sad; happy to fear; anger to sad; anger to fear. Pollak and Kistler (2002) used this task to examine emotional recognition in 40 maltreated children. Abused children were shown to over-identify anger, contrasting to control children who under-identified anger. The effect was anger specific, with no difference between groups shown for the other emotions. This anger-specific hypervigilance for threat was replicated within a later study investigating physically abused children (Pollak & Tolley-Schell, 2003).

No identified study has assessed emotional vigilance for threat in adolescent victims of bullying. The only known study which investigated emotional recognition for victims of bullying, did so with a younger sample, and did not investigate the effect of different contexts. Two-hundred children aged 9 to 11 took part in a facial expression recognition test. Results showed no significant differences in emotional recognition between victims and non-victims. Victims of relational bullying exhibited poorer emotional recognition abilities, particularly for angry and fearful faces. However, only small effect sizes were shown and the sample size of relational victims ( $n=11$ ) was perhaps too small for any firm conclusions to be drawn (Woods, Wolke, Nowicki, & Hall, 2009).

### *Conclusions*

Subsequently, this thesis utilises the morphed faces method to assess emotional vigilance for threat in adolescent victims of bullying. In a further advancement to previous studies, this investigation compares the emotional vigilance of victims to those adolescents who have been exposed to a traumatic life event, as well as to those adolescents who have been exposed to neither a trauma, nor victimisation. In doing so, this thesis aims to assess the specific affect of bullying upon the emotional vigilance and behaviour of victims. If victims of bullying are shown to react similarly to trauma-exposed adolescents, it may suggest that this effect is a consequence of the victimisation and traumatic experiences. This would support a causal comorbidity model between victimisation and alcohol-misuse, suggesting that bullying adapts victims' emotional vigilance for threat. In keeping with the self-medication hypothesis, this hypervigilance would imbue victims to drink alcohol in order to alleviate these symptoms.

### **1.9 Functional Magnetic Resonance Imaging literature**

To investigate the emotional vigilance of victims of bullying further, this thesis will analyse data collected from a functional Magnetic Resonance Imaging (fMRI) task. The use of fMRI techniques allow for safe, non-invasive investigation of individual's response to stimuli in-vivo. During an fMRI brain scan, the scanner identifies the brain regions which respond to the participants' behaviour, by tracking increases in blood flow and subsequent oxygen levels during a set period of time. This process allows the identification of all brain regions that are involved in a particular task or behaviour.

A-priori hypotheses based on previous literature, allow an investigation into the involvement of specific brain regions during a particular task. With the advent of fMRI, it is now possible to examine reactivity to emotional stimuli and to ascertain areas of the brain that are involved in processes such as emotional vigilance, without participants having to be aware of this aim and without having to interrupt the process (Berkman & Lieberman, 2009). Accordingly, fMRI methods allow the measurement of ongoing and uninterrupted psychological processes, to gain a better understanding of a participant's response to emotional stimuli. fMRI differs from methods such as the use of cortisol, which is used to assess stress response, as it is able to identify subtle changes to activation in different brain regions over a short period of time, and to see how emotional vigilance affects different centres of the brain.

### *1.9.1 Implicated brain regions*

Neuroimaging techniques have increased understanding of the role of the brain in response to stress (e.g. Pitman, Shin, & Rauch, 2001; Bremner, 2002). With regards to neural vigilance for emotional stimuli, the effect of trauma exposure has mainly been examined within adult populations. Both prefrontal and limbic brain regions have been implicated to show differential activation patterns for trauma-exposed groups in response to social stimuli. In a review of the literature on emotional responding in PTSD, Bremner (2002) concludes that PTSD symptoms are most robustly associated with decreased function in the medial prefrontal cortex, which includes both the anterior cingulate and the orbitofrontal cortex. This area has been associated with social difficulties (see Bremner, 2002), including difficulties in social judgement, understanding other people's intentions, interpreting the social meaning of moving shapes and inappropriate threat vigilance, a symptom included within PTSD (Frith & Frith, 2003; Schultz et al., 2003; Gallagher & Frith, 2004).

### *1.9.2 fMRI studies in adolescent groups*

Whilst many of the studies which investigate exposure to trauma have focused on adult populations, these cannot be assumed to be relevant for an adolescent population. During adolescence, processes key to social interactions, such as face processing and emotion recognition continue to mature (Taylor, McCarthy, Saliba, & Degiovanni, 1999; Batty & Taylor, 2006). The frontal cortex, which is involved in cognitive functions including social cognition and self-related regulation processes, continues to



develop throughout adolescence and into young adulthood (Casey, Geidd, & Thomas, 2000; Thompson et al., 2000; Luna & Sweeney, 2004). Due to differences in neural maturation levels, age specific behaviours should therefore be expected in response to adverse emotional stimuli.

Monk and colleagues (2003) demonstrated functional differences between adolescents and adults in the functioning of the frontal cortex and the anterior cingulate. Participants passively viewed fearful faces whilst focusing on either the emotional aspects of the stimulus (e.g. how the face made the participant feel), or they were required to divert their attention to a non-emotional property within the stimulus (e.g. the width of the nose). Adult participants were able to switch their attention, through the effective engagement and disengagement of the orbitofrontal cortex. Adolescents showed greater activation of both the orbitofrontal cortex and anterior cingulate and were unable to disengage their attention from the emotional aspects of the stimuli. Response to aversive social stimuli within adolescence may therefore be driven more by emotional centres of the brain, due to the under-development of frontal areas important for cognitive abilities. Consequently, adolescents who experience increased sensitivity towards emotional stimuli, due potentially to the experience of adverse life experiences, may lack cognitive maturation and therefore be at heightened risk for developing maladaptive coping behaviours.

Adolescents who have been exposed to trauma have been shown to display functional differences in both emotional and cognitive brain centres, in comparison to their peers. Yang and colleagues (2004) compared the neural functioning of two groups of Taiwanese adolescents (aged 12 to 14 years old) who had experienced the same earthquake; one group (n=5) met the diagnostic criteria for PTSD, whilst the other group did not (n=6). During fMRI brain scans, both groups were presented with visual earthquake related images, in addition to neutral stimuli. Results showed that in response to trauma related images, the non-PTSD group demonstrated increased activation in the anterior cingulate cortex in comparison to their own brain activation levels during the neutral paradigm; this effect was not shown within the PTSD group. Whilst generalisation from this study is limited due to the small sample size, results suggest that within groups of trauma-exposed adolescents, neural activation differs as a consequence emotional symptoms.

### *1.9.3 Neural responses to social ostracism*

No identified study has investigated the neural affect of bullying victimisation within an adolescent sample. However, the neural effects of social ostracism have been investigated within both adult (Eisenberger, Lieberman, & Williams, 2003) and adolescent groups using a ‘cyberball’ fMRI paradigm (Masten et al., 2009). During this task, participants are led to believe that they are involved in a game with other participants who are being simultaneously scanned in different centres. The aim of the task is to throw a ‘cyberball’ to one another. The task includes social inclusion and exclusion conditions. Masten and colleagues (2009) used this task to investigate the effect of social ostracism in a sample of 23 adolescents (aged 12 to 13 years old). Social exclusion was shown to increase activation in the insula as well as in the anterior cingulate cortex. Greater levels of self-reported distress were associated with increased activation of both the insula and subgenual anterior cingulate cortex. The right ventrolateral prefrontal cortex was negatively related to distress, whilst lower levels of distress were also associated with activity in the ventral striatum, an area which was implicated in the regulation of the anterior cingulate cortex. These effects were similar to those reported for an adult only sample (Eisenberger et al., 2003), showing that the prefrontal cortex may play a regulatory role in the experience of negative affect. Adolescents, who show increased vigilance for peer acceptance and rejection, may be more sensitive to rejection, with higher rejection sensitivity and interpersonal competency scores evoking greater neural evidence of emotional distress (Masten et al., 2009). This study has been replicated recently within 19 female adolescents (aged 14 to 16 years old). Results showed that social exclusion elicited an increased response in brain regions including the medial prefrontal cortex, anterior cingulate cortex and orbitofrontal cortex (Sebastian et al., 2011).

### *1.9.4 Neural response to threatening facial stimuli*

Viewing emotional faces has been shown to activate emotion specific brain regions for trauma-exposed participants. For example, PTSD patients have shown increased activation to fearful faces in comparison to happy faces, within the amygdala (Morris et al., 1996; Whalen et al., 1998; Rauch et al., 2000; Shin et al., 2005). Additionally, studies have shown that viewing fearful faces in contrast to happy faces leads either to increased or decreased activation levels of frontal regions such as the orbitofrontal

cortex, as well as decreased activation in the anterior cingulate and insula (Shin et al., 1999; Shin et al., 2005).

Many fMRI studies focus on participants' responses to fearful faces, as fear has been shown to be a robust predictor of amygdala activation (e.g. Whalen et al., 2001). Whilst fearful faces are threatening, they are ambiguous regarding the source of the threat. In contrast, angry faces indicate direct and immediate social threat and have been associated with increased activation in both cognitive and emotional regions, including the orbitofrontal cortex and anterior cingulate (e.g. Blair et al., 1999). Angry faces are arguably more commonly experienced in social interactions and will therefore influence a social-learning process, whereby increased previous exposure will prime individuals towards a particular reaction. Emotional vigilance for threat is important to investigate within victims of bullying, who are likely to experience both fear and anger as a consequence of victimisation, but may be more likely to encounter anger on the faces of their bullying perpetrators. Subsequently, in order to investigate victims' emotional reactivity to threat, this thesis utilises an fMRI facial paradigm that assesses reactivity to both angry and ambiguous faces.

### **1.10 Interventions to combat alcohol-misuse and bullying victimisation**

The previous review highlighted personality and coping strategy differences within the functional relationship between bullying victimisation and alcohol-misuse. In addition to investigating mechanisms underlying the association between these two outcomes, this thesis will also assess the effect of a personality-targeted coping-skills intervention programme on levels of victimisation within the whole sample, as well as alcohol problems for a subgroup of victims. Treatment studies can help to elucidate the functional relationship between bullying victimisation and alcohol-misuse: if an intervention which targets coping strategies does in fact improve coping strategies, with outcomes related to these coping factors and receipt of intervention, then it can be concluded that the coping factors are causal in the outcome behaviour. No known study has previously assessed the effect of such an intervention, which is targeted towards personality behavioural vulnerabilities, for both levels of victimisation and alcohol-misuse in groups of victims. The following section reviews the main studies that have been published in the past ten years, which have evaluated alcohol and victimisation

prevention programmes. This review will focus on school-based interventions, due to the school-based victimisation which is being assessed within this thesis.

#### *1.10.1 School based interventions for alcohol-misuse*

There is a large evidence base which investigates alcohol-misuse intervention programmes (e.g. reviews by Tobler & Stratton, 1997; Lochman & van den Steenhoven, 2002; Foxcroft, Ireland, Lister-Sharp, Lowe, & Breen, 2003; Winters, Fawkes, Fahnhorst, Botzet, & August, 2007; Fletcher, Bonell, & Hargreaves, 2008). An increasingly strong focus of intervention programmes is the prevention of alcohol-misuse, before the behaviour has become entrenched. This focus leads to programmes which target pre to early adolescents (e.g. Perry et al., 2003; Vicary et al., 2004; Buhler, Schroder, & Silbereisen, 2008; Ringwalt, Clark, Hanley, Shamblen, & Flewelling, 2010). Intervention models vary according to their focus; different programmes identify and target specific risk factors for alcohol-misuse, including increasing adolescents' knowledge of associated adverse consequences, or concentrating on behavioural expectations and intentions to use, as well as personal attitudes and beliefs (see Lopez, Schwartz, Prado, Campo, & Pantin, 2008).

Intervention models also differ regarding implementation, with a range of social-ecological contexts targeted (e.g. home and family life, school, peer groups, community) (Perry et al., 1996; Perry et al., 2000; Hogue, Liddle, Becker, & Johnson-Lekrone, 2002; Pantin, Schwartz, Sullivan, Coatsworth, & Szapocznik, 2003). According to international health organisations, schools can fulfil a vital role in promoting positive health behaviours (Lynagh, Schofield, & Sanson-Fisher, 1997). All schools within the UK are required as part of the national curriculum to include basic psycho-educational teaching about recreational drug or alcohol-use and the associated harms. However, school-based alcohol interventions have so far achieved only a limited level of success in preventing against drug and alcohol-use, with some empirical studies reporting positive results (e.g. Cuijpers, Jonkers, de, & de, 2002), whilst other studies have concluded that the school-based intervention model shows only limited long-term effectiveness and sustainability (e.g. Faggiano et al., 2005; Wiehe, Garrison, Christakis, Ebel, & Rivara, 2005; Thomas & Perera, 2006).

In order to improve the effectiveness of school-based intervention models, different approaches have been adopted, which include both whole-school and selective models. Whole-school universal models attempt to reduce substance-use by introducing changes to the overall organisation, policies and culture within the school, in addition to classroom based sessions (Flay, 2000; West, 2006). In contrast, selected interventions target subgroups of adolescents, who are often categorised as ‘higher risk’ and therefore deemed to be more vulnerable for risky behaviours (Holleran Steiker, 2008). By inducing changes in a problematic group of adolescents, targeted or selected interventions may be able to indirectly benefit the rest of the school student body.

Whilst the majority of programmes adopt whole-school prevention programmes, this model generally provides a single programme for all students, which cannot take into account the differing levels of risk and the heterogeneity of needs between students (e.g. Griffin, Botvin, Nichols, & Doyle, 2003; Holleran Steiker, 2008). Accordingly, universal interventions may not be as effective for those adolescents who are at higher risk for alcohol-misuse and may benefit from a more tailored programme. Such programmes can work to strengthen protective factors for specific groups of adolescents through teaching positive life skills, which have been linked to decreases in substance-use. Positive life skills include adaptive coping strategies, such as seeking social support, problem solving abilities, strategies to resist negative peer pressures and strategies to cope with strong negative emotions (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995; Kimber, Sandell, & Bremberg, 2008).

Adolescent victims of bullying are one such vulnerable group who could potentially benefit from interventions which focus on teaching positive coping strategies. With regards to victims of bullying, the school-based intervention approach benefits from its child-centred approach. This style of intervention is delivered to the youth directly and aims to prevent alcohol-use by reducing motivation, increasing awareness of pro-alcohol social influences, changing expectations from alcohol-use, increasing alcohol resistance skills and influencing the maturation of decision making competencies (Botvin et al., 1995; Botvin & Griffin, 2007). The positive reinforcing effect of substances has been shown to be mediated by expectancies and emotional responses to substances, therefore the efficacy of intervention programmes may be improved by targeted positive expectancies (Hogarth & Duka, 2006). Additionally, with respect to

adolescent bullying victims, the school environment is a suitable place in which to focus intervention efforts as the majority of adolescents' time is spent at school. For many victims of bullying, the school environment is central to their victimisation, either due to it being the location within which the bullying occurs, or as the location through which the victimisation is initiated (i.e. amongst a peer group who belong to the same school). The school environment can therefore remain important even if the victimisation extends beyond school hours using technological 'cyberbullying' tactics.

No intervention study within the literature has been identified that specifically targets alcohol-misuse in victims of bullying. This is possibly due to the paucity of research which investigates the association between bullying victimisation and alcohol-misuse. However, if this subgroup proves to be more at risk for initiating alcohol-use as part of a general maladaptive coping strategy, it is important that targeted interventions be developed which address the unique needs of this group. The following section will focus on school-based alcohol intervention programmes, which have been reported on within the past ten years, to allow an understanding of the current evidence base for alcohol prevention and how these programmes could potentially be adapted and targeted towards victims of bullying. For the purposes of this review, only intervention studies which have followed up participants for at least one year will be discussed (see Table 1.2).

The largest and most broadly implemented trial identified within the United States, is the 'Drug Abuse Resistance Education: DARE' programme (Ennett, Tobler, Ringwalt, & Flewelling, 1994). The original programme was run in schools by highly trained police officers who used group discussions, lectures, and interactive role playing to teach students strategies for recognising and resisting social peer pressures, enhancing decision making skills and increasing self esteem. Empirical evaluations of the DARE programme showed small but significant effects on alcohol-misuse. Participants who had already initiated alcohol-use at baseline were less likely to misuse alcohol post intervention (Clayton, Cattarello, & Walden, 1991). A meta-analysis of eight DARE trials showed only small effect sizes for the intervention on drug-use behaviour, including measures of tobacco, alcohol and marijuana (Ennett et al., 1994). A revised DARE programme, which included both peer-led activities and parental involvement, failed to show overall positive intervention effects 2 years post-intervention. The

intervention significantly decreased alcohol-use for boys; no significant intervention effects were shown for girls (Perry et al., 2003).

The 'Life Skills Training' (LST) is another intervention model which has been widely implemented throughout the US and Europe (e.g. Vicary et al., 2004; Vicary et al., 2006). This model includes teacher-led classroom sessions which focus on topics including communication skills, interpersonal relationships, critical thinking, problem solving and coping strategies. In addition to life-skills sessions, the programme aims to educate students about the immediate and long-term effects of substance-use, in order to enhance resistance skills. Results from trials adopting this strategy have shown small or non-significant effects (e.g. Buhler et al., 2008).

The ADAPT project implemented the LST programme over a 2 year follow up period in the United States with 732 students aged 11 to 12 years old. Results showed no overall intervention effect after 2 years. 'Higher-risk' girls who received an intervention showed an initial reduction in frequency of drunkenness and binge-drinking; initial effects disappeared after two years. No significant intervention effects were shown for male participants (Vicary et al., 2004; Vicary et al., 2006). A smaller LST trial was conducted in Germany with 448 school children with a mean age of 10.8 years. Results showed that the intervention increased knowledge about alcohol-use after 1 year. However, this group was perhaps too young to assess the intervention effects on alcohol-use (Buhler et al., 2008).

The ALERT Project is another intervention programme that has been implemented within American schools. Project ALERT is delivered by trained teachers for students aged 11 to 13 years old. The programme consists of 11 manualised classroom-based sessions and three booster sessions when students are aged 13 to 15 years old. Efficacy results are mixed, with some trials reporting no significant intervention effects over a one year period (Ringwalt et al., 2010; Kovach Clark, Ringwalt, Hanley, & Shamblen, 2010), whilst other trials do show some success for this model (e.g. Ellickson, McCaffrey, Ghosh-Dastidar, & Longshore, 2003).

An adapted version of the ALERT programme was conducted in 55 schools, which were randomised to either the intervention or control conditions; the control group

received the usual drug education curriculum. Eighteen months after the programme, the intervention groups showed significantly lower levels of alcohol-misuse and were less likely to suffer from problematic alcohol-related consequences. The intervention was marginally successful for a higher-risk subgroup of early initiators, with positive effects on current drinking and alcohol-misuse (Ellickson et al., 2003; Ghosh-Dastidar, Longshore, Ellickson, & McCaffrey, 2004). The revised programme was shown to reduce weekly alcohol-use, risky drinking and alcohol-related problems for higher-risk girls over a 1 year period; no significant intervention effects were shown for the whole sample or for higher risk boys (n=680) (Longshore, Ellickson, McCaffrey, & St Clair, 2007).

The majority of the trials are universal prevention programmes (see Table 1.2), and have produced inconsistent and weak effects for the reduction of alcohol-misuse (see Foxcroft et al., 2003). Many of these studies report differential effects between subgroups of adolescents; varying results have been shown between specified groups or genders determined to be 'at risk'. The differential results seen between subgroups within universal trials demonstrate the importance for investigating risk moderation within intervention trials (i.e. assessing for which subgroups of adolescents the programme was effective). The extent of subgroup effectiveness seen within the aforementioned studies, suggests that intervention models may benefit from a targeted approach. Selected interventions that are focused on the vulnerabilities for a specific 'higher risk' group may achieve greater effectiveness, due to targeting a more homogeneous group with similar vulnerabilities (Spath, Shin, Gyll, Redmond, & Azevedo, 2006).

An example of a targeted trial, which has shown some success in the prevention of alcohol-misuse, is the 'keepin' it REAL' programme (Hecht et al., 2008). This programme is a randomised controlled trial, which is targeted towards cultural differences. Participating schools were block randomised to one of four conditions, including three intervention programmes that were tailored for specific cultural groups: 'Latino', 'non-Latino' and 'multicultural'. The fourth condition was a comparison control group, which received the normal drug education curriculum. The programme which targeted American students in grades 6 to 8, consisted of 10 sessions based around four drug resistance strategies: Refuse, Explain, Avoid and Leave. Differing



results between cultural groups were demonstrated 1 year post-intervention. Taking part in the intervention workshops was shown to decrease growth in alcohol-use for non American-Indian participants but not for the American-Indian group for whom iatrogenic effects were shown (Dixon et al., 2007; Hecht et al., 2008; Marsiglia, Kulis, Yabiku, Nieri, & Coleman, 2011).

As previously discussed, victims of bullying who are at risk for alcohol-misuse are likely to engage with alcohol for specific reasons. As such, a targeted approach towards intervention may prove to be more effective at preventing alcohol-misuse within this vulnerable group. No targeted alcohol intervention study has been identified which is specific for victims of bullying, or that has assessed secondary intervention effects for victims of bullying.

**Table 1.2 School-based intervention studies for alcohol-misuse**

<b>Intervention Programme</b>	<b>Authors</b>	<b>Country</b>	<b>N</b>	<b>Age</b>	<b>Follow-Up</b>	<b>Intervention Design</b>	<b>Findings</b>
Drug Abuse Resistance Education (DARE) Plus	Perry et al., 2003	United States	DARE Plus Intervention: 2221  Original DARE Intervention: 2226  Control: 1790	11-12	2 years	24 schools randomised to 3 conditions: original DARE programme, DARE plus programme and a delayed control condition. DARE implemented by police officers and consisted of 10 sessions focusing on skills to resist influences to use substances, character building and citizenship skills. The DARE Plus intervention led by teachers included classroom based , peer-led and parental involvement for 4 sessions across 4 weeks; extra curricular activities; and neighbourhood action teams to address neighbourhood and school-wide issues relating to drug use.	No significant intervention effects in comparison to the control condition for the original DARE programme. DARE Plus programme reduced alcohol-use in boys (no significant intervention effects for girls).
Healthy Schools and Drugs Project	Cuijpers et al., 2002	The Netherlands	Intervention: 1156 Control: 774	12-13	3 years	Quasi-Experimental programme (matched control group, but no random assignment to experimental groups). The programme consisted of 5 components implemented over 3 years, which included school organisation changes; 3 lessons on alcohol-use; a system for early detection of students with substance-use problems, with support and counselling for affected students; parental involvement.	Significant reduction in frequency of alcohol-use, the number of weekly alcoholic drinks and the number of drinks per occasion. Increase for alcohol knowledge, but no effect on attitude towards substance use.
The ADAPT Project	Vicary et al., 2004 Vicary et al., 2006	United States	LST: 234  Integrated LST: 297  Control Condition: 201	11-12	2 years	9 schools randomised to 1 of 3 conditions: Life Skills Training (LST); LST integrated into the regular school curriculum; treatment as usual control condition. LST programme included 15 sessions in 7 <sup>th</sup> grade, 10 sessions in 8 <sup>th</sup> grade and 5-7 in 9 <sup>th</sup> grade. The integrated LST did not have a set number of sessions, but all core components of the programme had to be taught in each school year.	No effect of either intervention condition for the whole sample. The integrated LST intervention reduced frequency of drunkenness and binge-drinking only for higher risk females after the 2 <sup>nd</sup> year of the programme
Life Skills Training (LST)	Buhler et al., 2008	Germany	Intervention: 256 Control: 192	10.8	1 year	Teacher led Intervention included 8 life skills training sessions (communication, critical thinking, problem solving, coping with stress). 4 sessions on substance related issues (e.g. immediate effects of alcohol and resistance skills training). Control group was treatment as usual.	Intervention group showed increased knowledge about alcohol and nicotine use.
Life Skills Training combined with TimeWise	Ferrer-Wreder et al., 2010	United States	Intervention: 433 Control: n=482	12	(1 academic year)	Predominantly African American sample. Study combined 2 intervention programmes: LST aimed to teach decision making, set personal goals and realise the potential consequences of their behaviour. TimeWise focused on healthy ways to use free time.	No significant intervention effects for drug use (mean score of alcohol, marijuana and other drug use). Effects shown for assertiveness, anxiety management, drug use intentions and leisure motivations.

EU-DAP (Unplugged)	Vigna-Taglianti et al., 2009 Caria et al., 2011 Faggiano et al., 2010	Europe	Intervention: 3532 Control: 3547	12-14	18-months	170 schools recruited from 7 European countries. 12 sessions split into 3 blocks (psychoeducation on substance use; social skills including normative education on prevalence and social acceptance of substance use); strengthening intrapersonal skills.	Reduction of alcohol-related problems; (no effect in baseline drinkers (n=743)). Delay in frequent drinking for baseline occasional/non-drinkers. Reduced frequency of drunkenness.
Project ALERT	Ringwalt et al., 2010	United States	Intervention: 2765 Control: 2805	11-13	1 year	34 schools completed trial. 11 classroom based, manualised intervention sessions followed by 3 booster sessions (each lasting 45 minutes), conducted over 2 years.	No significant effect of intervention shown.
Revised Project ALERT	Ellickson et al., 2004 Ghosh-Dastidar et al., 2004	United States	Intervention: 2553 Control: 1723	12-13	18-months	55 schools randomised to either intervention or control conditions. Programme included 11 sessions in 7 <sup>th</sup> and 8 <sup>th</sup> grade & 3 booster sessions in 9 <sup>th</sup> & 10 <sup>th</sup> grade (not all intervention groups received the booster sessions). Incorporated information and social skills education	Reduction in alcohol-misuse, fewer associated negative consequences There were no significant effects for initial and current drinking. No effect for highest-risk early drinkers: marginal decrease in current drinking and alcohol-misuse. Modest change in alcohol-related beliefs.
Project ALERT (replication)	Clark et al., 2010	United States	Baseline: N=4920	11-13	1 year	Schools randomised to control or intervention condition. Prevention administered by teachers included 11 core sessions in 6 <sup>th</sup> grade and 3 booster sessions in 7 <sup>th</sup> grade.	No evidence of intervention effect on alcohol-use.
Project ALERT Plus	Longshore et al., 2007	United States	ALERT Plus intervention: 370  Original Project ALERT: 457  Control: 556	11-13	1 year	55 schools recruited. Utilised the same Project ALERT curriculum as previous trials, with an additional 5 booster lessons in 9 <sup>th</sup> grade. Sample comprised of 'at-risk' adolescents: those who had already initiated tobacco or marijuana use before the start of the curriculum in grade 7.	The ALERT Plus intervention reduced weekly alcohol-use, risky drinking, associated negative consequences and changed pro-drug attitudes for at-risk girls. No significant effects for at-risk boys, or for at-risk adolescents with the basic project ALERT curriculum.
Project SUCCESS	Clark et al., 2010	United States	Intervention: 735 Control: 955	16	1 year	Selective prevention programme of high risk adolescents in 14 'alternative schools'. Trained counsellors implemented programme consisting of 4 components: psychoeducation in small groups with 6-8 weekly sessions; individual and group counselling; parental communication; referrals to community agencies.	No evidence of positive effect of intervention (measured 30-day use of alcohol and drinking to intoxication).
Life Skills Training	Botvin et al., 2001	United States	Intervention: 2144 Control: 1477	12-9	1 year	29 schools randomised to intervention or control conditions. included with mainly ethnic minority students (62% received free school lunches). Programme included 15 sessions in the 1 <sup>st</sup> year & 10 booster sessions in 2 <sup>nd</sup> year. Programme taught drug resistance skills, development of personal & social skills. The control group received the regular programme in place within the city.	Reduction in drinking and drunkenness. Positive effect on cognitive, attitudinal and personality variables associated with substance use.

Keepin' it REAL	Marsiglia et al., 2011 Dixon et al., 2007 Hecht et al., 2008	United States	American Indians: 685  Non-American Indians: 3537	11-13	1 year	Schools block randomised to 1 of 4 conditions (3 intervention groups targeted for ethnicity: Latino, non-Latino, multicultural) and 1 comparison control group. Programme consisted of 10 sessions focusing on 4 drug resistance strategies: Refuse, Explain, Avoid and Leave.	Decreased alcohol-use growth for the non-American Indian groups. No effect for the American-Indian group, with the intervention group showing steeper growth in alcohol-use over time. The 'Latino' and 'Multicultural' conditions were the most effective.
Drug Resistance Strategies (DRS)	Hecht et al., 2006	United States	1. Mexican/Mexican-American: 1352 2. White/African-American: 1180 3. Multicultural: 1722 4. Control: 2044	11-12	14 months	35 schools implemented the 'keepin' it REAL' curriculum. Intervention consisted of 10 sessions taught by teachers that focused on psychoeducation for knowledge, motivation and skills needed to resist drug use and media prevention strategies; booster sessions completed before 14 month follow-up. 65% of sample were Mexican/Mexican-American. Control group was treatment as usual.	Decrease in growth of recent alcohol-use. The Multicultural programme was the most broadly effective (effects on alcohol and marijuana use). There were no significant effects shown for the White/African-American intervention.
Towards No Drug Abuse (TND)	Sun et al., 2006	United States	1. Classroom: 243 2. Classroom plus external activities: 250 3. Control condition: 232	16.8	4-5 years	21 alternative high schools (students not in regular system due to difficulties including attendance, drug use) randomly assigned to control condition (standard care), classroom intervention or classroom plus external activities intervention (which included external activities organised by the school). Programme included 9 sessions of health motivation, social skills & decision making.	No effect shown of either intervention condition on 30-day alcohol-use.
Towards No Drug Abuse (TND-4)	Sun et al., 2008	United States	1. Cognitive only: 767 2. Cognitive + behavioural: 688 3. Control: 609	15.3	1 year	18 regular and alternative secondary schools randomised to 1 of 3 conditions: control; cognitive perception information programme; cognitive perception plus behavioural skills programme. 12 sessions were delivered by project health educators or trained teachers.	Neither intervention condition showed significant effect for past 30-day alcohol-use.
Towards No Drug Abuse (TND)	Rohrbach et al. 2010	United States	1. Intervention: 1857 2. Control: 681	14.8	1 year	65 non-alternative secondary schools randomised to intervention or control conditions. Teacher delivered interventions consisted of 12 classroom sessions, over 4 weeks. Interactive teaching techniques used to teach consequences of substance use, misperceptions of alcohol, communication, decision making & coping skills.	No significant effect of intervention shown for alcohol-use.
Towards No Drug Abuse (TND) and TND-Network	Valente et al., 2007	United States	1. TND; 182 2. TND-Network: 224 3. Control: 135	16.3	1 year	14 alternative secondary schools randomly assigned to 1 of 3 conditions: control; TND and TND-Network (peer-led interactive version of TND: small-group discussions in pre-existing friendship groups).	Neither intervention condition was shown to reduce 30-day alcohol-use in comparison to the control condition.
Take Charge of Your Life (TCYL)	Sloboda et al., 2009	United States	Intervention: 5761 Control: 4681	12	2 years	83 public schools randomised to either intervention or control conditions. The programme consisted of 10 classroom based sessions implemented by police officers & 7 booster sessions after 2 years. Focus on teaching about	Intervention showed a negative effect on alcohol-use over the past year amongst non-users at baseline in comparison to control groups.

						the personal, social and legal risks associated with substance use, with the aim to improve life skills (e.g. communication, decision making, & refusal skills).	
Preventing Heavy Alcohol-use in Adolescents (PAS)	Koning et al., 2009	The Netherlands	1. Parent: 608 2. Student: 675 3. Combined: 588 4. Control: 699	12.68	22 months	Cluster randomised intervention trial with 4 conditions: Parent intervention aimed to encourage parental rule-setting on alcohol consumption; student intervention: 4 digital lessons; combination of parent and student interventions; control group was treatment as usual.	The combined intervention delayed weekly alcohol consumption and reduced frequency of drinking. No effect for either of the separate parent or student programmes.
School Health and Alcohol Harm Reduction Project (SHAHRP)	McBride et al., 2004	Australia	Intervention: 1111 Control: 1232	13	20 months	14 schools randomly assigned to either intervention or control conditions. Intervention conducted in 2 phases over 2 years. Phase 1 included 17 skill-based activities conducted over 8-10 lessons. Phase 2 consisted of 12 activities delivered over 5-7 weeks (e.g. role-play decision making, and strategies to reduce alcohol-related harm).	Decreased growth in alcohol initiation. Intervention group was 4.2% less likely to engage in risky drinking levels & reported 22.9% less harmful consequences from drinking alcohol in comparison to control group.
Motivational Interviewing (MI)	McCambridge et al., 2011	United Kingdom	1. Motivational Interviewing: 206 2. Drug Awareness control: 210	16-19	1 year	12 further education colleges randomised to either intervention or control conditions. Motivational interviewing compared to standard classroom delivered Drug Awareness curriculum over the course of 1 lesson.	The MI intervention was not effective for any of the alcohol outcome measures.
Alcohol Education Intervention	Morgenstern et al., 2009	Germany	Intervention: 839 Control: 847	11-12	1 year	30 public schools randomised to either intervention or control conditions. Intervention included 4 teacher implemented interactive lessons with manuals for both students and parents. Control group was treatment as usual (without any systematic alcohol education).	Increase in alcohol knowledge & decrease in life time binge drinking. No effects shown for attitude to alcohol, intention to drink, life time use and past month alcohol-use.
Preventure	Conrod et al., 2008	United Kingdom	Intervention: 199 Control: 169	14	1 year	13 secondary schools randomised to either intervention or control conditions. Therapists led two 90-minute interventions targeting personality risk, with 4 high risk subgroups. Control group was treatment as usual	Individuals in the sensation-seeking intervention group were 50% less likely to binge-drink.
CLIMATE Shools	Vogl et al., 2009	Australia	Intervention: 611 Control: 855	13	1 year	16 Catholic and independent schools randomised to intervention or control conditions. The intervention was internet based and included 6, 40 minute alcohol-related sessions delivered over six months. Each session included an individual internet activity and a teacher-led activity. Control groups received standard health curriculum.	Increase in alcohol-related knowledge & decreased positive expectations of alcohol. Reduction for girls in alcohol consumption & frequency of binge drinking. No effects on alcohol-use or knowledge for male participants.
CLIMATE Schools: Alcohol and Cannabis Course	Newton et al., 2010	Australia	Intervention: 397 Control: 367	13	1 year	10 schools randomised to either intervention or control conditions (CLIMATE programme implemented).	Increase in alcohol knowledge, a reduction in average weekly alcohol consumption & frequency of binge-drinking to excess. No effects for expectancies or alcohol-related harms.
HealthWise	Smith et al., 2008	South Africa	N=2383	14.0	2 years	9 schools were recruited from a former township near Cape Town. Programme consisted of 12 lessons in 1 <sup>st</sup> year,	Reduction of growth in recent and heavy alcohol-use. Decreased 30-day

						followed by 6 booster lessons in 2 <sup>nd</sup> year covering topics such as anxiety and anger management, decision making, self-awareness & attitudes towards risky behaviours, & targeting positive use of free time (e.g. beating boredom).	alcohol-use; effect strongest for girls. For baseline non-drinkers, the intervention decreased 30 day drinking for girls, but not for boys.
Capable Families and Youth Study.	Spoth et al., 2005	United States	1. Combination: 447 2. School: 500 3. Control: 414	11-12	5.5 years	36 rural secondary schools randomly assigned to 1 of 3 conditions: combined family and school intervention; school only intervention; control condition. The family intervention (Strengthening Families Program) consisted of 7 sessions over 7 weeks, with concurrent 1 hour parent and youth skills building session, followed by 1 hour combined session (focus on formulating future goals, dealing with stress and emotions, skills to overcome peer pressure). The school intervention (Life Skills Training) included 15 sessions in 1 <sup>st</sup> year & 5 booster sessions in 2 <sup>nd</sup> year. The intervention taught social resistance, management and social skills, & alcohol knowledge.	Reduction in initiation of alcohol-use & slower increase in drunkenness initiation (the school only intervention showed marginally stronger effects). Subgroup moderation analyses for higher risk students (those who had initiated use at baseline of at least 2 of 3 substances including alcohol). Higher risk intervention students showed reduction in alcohol frequency in comparison to higher risk students in the control condition.

### *1.10.2 School based interventions for bullying victimisation*

Similar to the alcohol prevention programmes, a large body of research has assessed the effects of school-based bullying interventions to reduce levels of bullying perpetration and victimisation. The importance of school involvement in the prevention of bullying victimisation is such that the national Office for Standards in Education (OFSTED) partially grades schools based on their development and use of anti-bullying policies and procedures (see Smith & Shu, 2000). Most European and American schools have implemented, or are required to implement anti-bullying intervention policies (Smith & Shu, 2000; Limber & Small, 2003; Olweus, 2004). The effectiveness of these policies is mixed, with many different strategies utilised, and some showing mixed or iatrogenic effects within the same programme (e.g. Pepler, Craig, Ziegler, & Charach, 1994).

The Olweus Bullying Prevention Program was the first school-based anti-bullying programme. This programme has been widely implemented throughout Europe and North America and remains one of the most successful interventions to date (Olweus, 1991). The programme was developed in Norway, in reaction to widely publicised victim-suicides, and aims to reduce and prevent against bullying problems. The initial trial included 3200 students in grades 5 to 7 and 9 within 30 schools. The whole-school programme which included school-wide rules, teacher-training, bullying curriculum and counselling, showed reductions of over 50 percent in victimisation and bully perpetration levels, as well as substantial declines in other anti-social behaviours and an increase in general school-life satisfaction (Olweus, 2005). A replication trial conducted by Olweus and colleagues (2004), labelled the 'new Bergen Project' showed a 40 percent reduction in bullying victimisation in addition to a 50 percent reduction in bullying other students.

Many studies have attempted to replicate the Olweus programme, with mixed results (e.g. Pepler et al., 1994; Ortega & Lera, 2000; Bauer, Lozano, & Rivara, 2007). Roland (2000) used the same design in a different Norwegian town, yet showed iatrogenic effects of the intervention, with increased levels of victimisation, bullying perpetration and social exclusion for boys. Differences between the original and replication trials may have been caused by discrepant school-based implementation levels, with the replication trial reporting lower levels of school-staff participation.

**Table 1.3 School-based intervention studies for bullying victimisation**

Authors	Country	N	Age	Follow-Up	Intervention Design	Findings
Andreou et al., 2007	Greece	Control: 206 Intervention: 248	Mean age = 10	1 year	10 schools recruited. School based curriculum based on raising awareness, self reflection and relevant problem solving skills. Four week period of class-based activities implemented by classroom teachers (8 lessons totalling 8 hours). Self report questionnaires administered at baseline, immediately following the intervention, at the end of the academic year and six months later.	No significant decline in either self reported bullying or victimisation levels (although significant increase in bullying and 'reinforcer' behaviour within control group). Reduction in number of 'bystander' children. Increases in self-efficacy beliefs for intervening in victimisation incidents. Limited longer term effects.
Baldry & Farrington, 2004	Italy	Control: 106 Intervention: 131	Mean age = 13	4 months	3 schools included in the study. Experimental school based intervention consisting of 3 videos and a booklet to develop social cognitive competence skills for understanding aggressive behaviour (intervention not specific to bullying victimisation). Intervention lasted 3 days (a 3-hour session once a week for 3 weeks). A fourth session conducted after 4 months. Students were randomised within schools to either intervention or control condition. Self report questionnaires administered at baseline and then following the intervention programme.	Increased programme efficacy for older students (some iatrogenic effects of the intervention for younger students). Decrease of victimisation levels for older students in the intervention group (control group showed increase in victimisation)
Bauer et al., 2007	United States	Intervention: 4959 Comparison: 1559	11-13 years old	1-2 years	10 schools recruited (7 Olweus intervention and 3 non-formal prevention programme). Self report questionnaires on relational and physical victimisation administered pre and post intervention. Aim to evaluate efficacy of Olweus bullying prevention by comparing to 3 random prevention strategies schools.	No overall effect. Significant reduction in victimisation levels for Caucasian participants when separately analysed by ethnicity (no effect found for other ethnicities and no differences by gender or grade).
Bowllan, 2011	United States	Intervention: 112 Comparison: 158	12-13 years old	1 year	1 urban Catholic school recruited. Investigated impact of Olweus Bullying Prevention Programme in age-lagged, therefore between-subjects, quasi-experimental design (programme is school-wide and requires whole classes and school-wide participation, therefore cannot randomly assign students to conditions).	Significant intervention effects for 7 <sup>th</sup> grade female students between the intervention and baseline-comparison group. Iatrogenic effects seen for 8 <sup>th</sup> grade females students: 25% increase in victimisation and 20% increase in physical bullying. 35% decrease in relational victimisation and 36%



						reduction in bullying others. No significant effects for boys.
Cross et al., 2011	Australia	Intervention: 688 Control: 688	8-9 years	2 years	29 schools recruited. Schools randomised to either intervention or control conditions. Control schools received standard government health education curriculum and bullying policy practice. Targeted the whole school, classroom, family, and individuals. Collected self report data. Teachers trained to administer interventions. Family interventions included nine 10-15 minute activities that were linked to classroom activities. Activities developed to reinforce classroom learning and to raise parents awareness and skills about bullying. 16 brief newsletters were sent to participants homes over 2 years to help prevention and management of bullying.	Intervention students significantly less likely to observe bullying or to be bullied after 3 years and were more likely to tell someone if they were being bullied after 12-months in comparison to non-intervention students. No differences in self-reported levels of bullying perpetration.
Fekkes et al., 2006	Holland	Intervention: 692 Control: 899	Mean age = 10	2 years	47 schools recruited. Self report data collected. Intervention involved teachers, victims, perpetrators, uninvolved students and parents and aimed to reduce bullying behaviour. Teachers were trained to administer interventions and schools were asked to develop anti-bullying policy.	After 1 <sup>st</sup> year follow up, victimisation decreased by 25% and bullying perpetration levels decreased in the intervention group compared to control group. Self reported peer relationships improved in the intervention schools. No effects of intervention on any outcome measure after 2 years.
Fonagy et al., 2009	United States	CAPSLE intervention: 563  School Psychiatric Consultations: 422  Control: 360	7-9 years	3 years	9 schools recruited to take part in either the 'Creating a Peaceful School Learning Environment: CAPSLE, a manualised psychodynamic whole school intervention, which assumes that everyone plays a role in bullying and focused on anti-violence and power dynamic. The second intervention was a school psychiatric consultation programme: a manual was followed 4 hours per week for 2 years. This intervention focused on individual children. The control group was treatment as usual control condition.	CAPSLE intervention had significant effects on peer reported victimisation and aggression, as well as self reported aggression and aggressive bystanding, in comparison to control schools. Effects maintained after a one year follow up period.
Fox & Boulton, 2003	United Kingdom	Intervention: 15 Control: 13	9-11 years	1 year	An 8 week 'Social Skills Training' (SST) programme was developed for victims of bullying. Topics assessed included listening and conversations, body language, assertiveness and dealing with bullies. Peer nominations used to assess outcome measures.	Increase in self-esteem for intervention compared to the control group. No other significant effects of the intervention shown.
Frey et al., 2005 Frey et al., 2009	United States	Intervention: 296 Control: 248	8-11 years	2 years	6 schools recruited and assigned to multilevel bullying intervention or a control condition. Playground behaviour observed and rated, as well as self report information	Reductions shown for playground bullying, victimisation, non-bullying aggression, destructive bystander

					collected. 'Steps to Respect' school-wide programme included skill and literature based lessons over a 12-14 week period. The intervention aimed to decrease school-based bullying by increasing school staff awareness and responsiveness, socially responsible beliefs and teaching social-emotional skills to counter bullying and promote healthier relationships. Programme also included information for parents about the programme and the school's anti-bullying policies and procedures.	behaviour and argumentative behaviour. Intervention students reported increased assertiveness in responding to bullying behaviour, in comparison to control group students. No decreased in problem behaviours for the control group, with some increases shown.
Jenson & Dieterich, 2007 Jenson et al., 2010	United States	Intervention: 670 Control: 456	10 years old	2 years	28 schools recruited and assigned to selected modules of the interactive 'Youth Matters' prevention curriculum, or to a no-treatment control condition. Prevention programme encourages positive relationship between students, promoting changes to the school community. Programme consists of 4 different 'modules' that are made up of 30-40 page stories linked to skills taught over 10 sessions. Self report information collected.	No change in bullying perpetration was shown. Victimization scores reduced, with significantly greater decreases shown in the intervention group compared to the control group for a continuous measure (no significant changes reported for the dichotomous victimisation outcome).
Karna et al., 2011	Finland	Intervention: 4201 Control: 3965	9-11 years	9 months	78 schools recruited and randomly assigned to intervention and control conditions. Universal and indicated components to prevent occurrence of bullying and intervene in individual cases. Three different developmentally appropriate versions for ages 7-9 years, 10-12 years and 13-15 years of age. Includes 20 hours of student lessons delivered by teachers to raise awareness of group role in bullying, increase empathy for victims, promote strategies to support victim. Lessons include discussions, group work, role plays and films about bullying. Indicated actions include addressing each case of bullying witnessed or revealed. Prosocial students are encouraged to support victim.	Intervention had positive effects on self and peer reported victimisation, and self reported bullying perpetration in comparison to the control group. Intervention group defended victims more in comparison to control group; however, this effect was lost at the 9 month follow-up. Intervention group assisted and reinforced bullying less, had increased anti-bullying attitudes and empathy for victims in comparison to the control group.
Menesini et al., 2003	Italy	Intervention: 178 Control: 115	11-14 years	1 year	2 schools were recruited. Befriending intervention programme aimed to reduce bullying by raising awareness of bullies own and others behaviour, enhance bystander support for victim, and to improve the quality of interpersonal relationships in the classes.	Intervention prevented the increase in negative behaviours and attitudes reported by the control group. Pro-bullying bystander roles remained stable or decreased in the intervention group, but increased in the control group. Pro-victim attitudes decreased in control group, but remained stable in the intervention group.
Salmivalli, 2001	Finland	N=196	13-15	5 days	1 school recruited to take part in a week long intervention	Campaign effective for girls, with

			years old		programme which included series of school-wide and classroom based activities. Programme utilised peer counsellor model. These are trained students who were chosen by their peers. The aim of having peer counsellors is to promote good inter-student relations, social responsibility and safe school environment. Activities included a whole-school meeting with information about the campaign and bullying in general, peer led classroom and small group discussions,	decreases in both self and peer reported bullying, as well as increase in attitudes towards potential and willingness to intervene against bullying problems in their class. For boys there was small decrease in self reported bullying, but increase in pro-bullying attitudes.
Sapouna et al., 2010	UK and Germany	Intervention: 509 Control: 560	mean age = 8.9 years	4 weeks	27 schools recruited and assigned to either take part in the 'FearNot!' virtual intervention or a control condition. Programme consisted of 3 sessions lasting 30 minutes, over a 3 week period. Self report data collected.	Victims at baseline who took part in the interventions were less likely to be victims at the follow-up, in comparison to control group; specific to UK children.
Berry & Hunt, 2009	Australia	Intervention: 22 Control: 24	mean age = 13 years	3 months	7 Catholic schools recruited. Intervention targeted towards boys with high levels of anxiety. Programme included 8 weekly hour long sessions of a cognitive behavioural manualised group intervention, which included anxiety management techniques and education on bullying, adaptive coping and social skills. Parents attended a separate, parallel programme.	Significant reductions in bullying experiences, as well as anxiety, depression and degree of distress associated with victimisation. No effect of intervention for self esteem or changing aggressive or avoidant responses to victimisation.
Black & Jackson, 2007	United States	Mean N per school=792 students	7-12 years	4 years	6 schools recruited. Assessed effect of Olweus bullying prevention programme in group of ethnically diverse urban students. Programme included emphasising anti-bullying school rules, enforcement of positive and negative consequences and training adults to monitor student activities.	Intervention programme associated with 45% decrease in bullying incidents per 100 student hours.
Giannotta et al., 2009	Italy	Intervention: 76 Control: 79	Mean age = 12.24 years old	2 months	1 urban school recruited. Classes randomly assigned to intervention or control conditions. Expressive writing intervention assessed that consisted of 4 sessions that lasted 20 minutes (2 per week). Intervention group asked to write about personal emotional events that related to recent peer problems experienced at school. Control group asked to write about trivial topics.	Victimised adolescents in the intervention group showed stronger positive effects of the intervention relative to those with lower levels of victimisation. Victims in the intervention group were more likely to engage in positive, active coping strategies (e.g. optimistic thinking), but they also increased in avoidant coping strategies.
Olweus, 2005	Norway	n=~21,000	10-13 years old	1 year	The Olweus Bullying Prevention Programme administered to 3 consecutive matched year groups of students. All students received intervention. After the intervention had	Reductions in bullying and victimisation by 32% to 49%.

					been completed pre-intervention baseline scores for one year group compared to post-intervention scores for a 2 <sup>nd</sup> year group.	
Roland et al., 2010	Norway	Intervention: 3979 Control: 2828	7-12 years old	1 year	146 schools recruited to implement the 'Zero' anti-bullying programme. Programme forms part of the 'Norwegian Manifesto Against Bullying' launched in 2002 by Norwegian government. 'Zero' aims to create school context that prevents aggression and therefore prevent bullying. Staff encouraged to define and monitor clear standards of positive social behaviour and to demonstrate zero tolerance for bullying, encouraging empathetic behaviour from both pupils and staff. 15 minutes per week of curriculum focuses on teaching about bullying. Clear school procedure for dealing with bullying outlined by programme. Schools grouped together to meet and be trained on 'Zero'.	Programme showed reduction in bullying perpetration levels for the intervention group in comparison to the control group. Significant reduction in victimisation levels for intervention group, but not significantly different reduction in comparison to the control group.
Salmivalli et al., 2005	Finland	N=1220	9-12 years old	1 year	16 schools recruited. Data includes both self and peer reports. School teachers trained to implement the intervention programme. Participant role approach for the intervention that recognises different roles for students to be involved in bullying, that includes most students within a year group. Three components addressed in the intervention: school, class, and individual students. The main emphasis was on group processes of bullying and therefore interventions focused on the classroom level. A consecutive cohort design (similar to that used by the Olweus programme) was utilised.	Positive impact of intervention shown for frequency of bullying and victimisation, witnessing and direct experiencing of bullying, attitudes about bullying and bystander behaviour.
Stevens et al., 2000	Belgium	Intervention: 219 Control: 229	13-16 years old	19 months	11 schools recruited. Intervention programme consisted of 3 modules that focused on the school environment and the peer groups, as well as direct bullying issues for specific students. The modules included whole school anti-bullying policy, curriculum based intervention and aims to alter the peer system to be more supportive. Curriculum had social cognitive focus teaching perspective taking, problem solving and social skills training. Intervention included 4 sessions of 2 50 minute periods.	Mixed results. Positive intervention effects on attitudes towards victims and bullies, and on self efficacy to intervene, as well as increases in actual rates of intervening. However, decrease shown for pro-victim attitudes and increase in pro-bully attitudes.
Allen, 2010	United States	Pre-intervention: 870 Post-intervention: 820	14-16 years old	2 years	1 school recruited. Whole school intervention based on social-emotional learning principles that included videos and assemblies on bullying, class discussions and student led social support system, as well as parent information	No significant change in victimisation (non-significant increase). Self reported levels of bullying perpetration decreased by approximately 50%. Peer

					evenings.	interventions into bullying incidences increased and there were self reported decreases in student aggression.
Cowie & Olafsson, 2000	United Kingdom	Pre-intervention: 300 Post-intervention: 207	14-15 years old	7.5 months	1 school recruited with high levels of problematic behaviour. Intervention was setting up of a peer support system.	No positive effects of intervention shown. No change in victimisation levels. Significant increase in bullying others. Peers were shown to positively intervene less after the intervention.
DeRosier, 2004	United States	Intervention: 187 Control: 194	Mean age = 8.6 years old	1 year	11 schools recruited. Social skills group intervention (S.S.GRIN) targeted towards children experiencing peer problems. S.S.GRIN is a manualised intervention that combines social learning and cognitive behavioural techniques, with aim to develop basic behavioural and cognitive social skills, reinforce prosocial attitudes and behaviour and develop adaptive coping strategies against teasing and peer pressure.	Intervention increased peer liking, self esteem and self efficacy and decreased social anxiety in comparison to the control group. Stronger intervention effects shown for aggressive children, who showed greater reduction in aggression and bullying behaviour in comparison to control group.
Hunt, 2007	Australia	Intervention: 155 Control: 289	12-15 years old	1 year	6 schools recruited. Schools randomly assigned to either intervention or control condition. Intervention consisted of education to students, parents and teachers about bullying and strategies to prevent bullying. Intervention included 2 hour classroom based discussion on bullying to raise awareness of bullying behaviours, promote empathy for victims and develop strategies to cope with bullying.	No significant effects of the intervention to reduce victimisation in comparison to the control condition. Significant reductions in bullying others alone, with significant effect specifically for boys in comparison to control schools. No effect of intervention on pro-bullying attitudes.
Mooij, 2005	Holland	Pre-intervention 1: 1055  Post intervention: 4159	12-18 years old	(8 years)	Study investigated effect of a national governmental initiated campaign to change schools policy on bullying (in 1992). Between groups design comparing pre-policy change survey results to post-policy change survey results (in 2000). Inventory of anti-bullying materials and instruments made available to schools	Comparisons of the 1991 and 2000 surveys showed increases in victimisation levels, but decreases in bullying perpetration scores

Within the United Kingdom, an extensive 'Anti-Bullying Project' was developed in Sheffield, sponsored by the Department for Education in 1991/1992. Approximately 7000 students from 23 different schools were involved in the programme (Smith et al., 1994). Victimization from bullying was shown to decrease by 14 percent in primary schools and 7 percent in secondary schools (Whitney & Smith, 1993). Longer term effects of the project were however inconsistent, with some schools reporting further positive effects, whilst 7 of the original schools showed that bullying rates increased 1 year post-intervention. The schools who continued the anti-bullying strategies did not experience this increase; some schools showed differential gender effects of the intervention (Eslea & Smith, 1998; Smith, 2004; Smith, Sharp, Eslea, & Thompson, 2004).

In Canada, Pepler and colleagues (1994) developed an anti-bullying intervention programme which was modelled on the Olweus project. The trial which included 1000 students aged 5 to 14 years old, showed an 18 percent decrease in the number of students reporting victimisation in the past 5-days 18-months post-intervention. The results from this trial were however inconsistent, with a non-significant increase in victimisation, as well as a significant increase in bullying perpetration (Pepler et al., 1994). One of the most successful replication trials published to-date was conducted in Seville, Spain between 1995 to 1996; and 1999 to 2000, with 4914 students aged 8 to 16 years old. Results showed that the intervention decreased victimisation levels by 57 percent and the rates of bullying perpetration by 16 percent. Interpretation of these results is hindered however by the non-random selection of schools and the high rates of school attrition (Ortega et al., 2000).

There have been many reviews conducted, which highlight the mixed results shown so far within the bullying intervention field (e.g. Smith, Ananiadou, & Cowie, 2003; Baldry et al., 2004; Smith et al., 2004; Vreeman & Carroll, 2007; Ferguson, San Miguel, Kilburn, & Sanchez, 2007; Merrell, Gueldner, Ross, & Isava, 2008). Baldry and Farrington (2004) reviewed 16 bullying intervention programmes from across 11 countries. Of the included studies, 8 reported positive effects, 4 showed small or negligible effects, whilst 2 reported both positive and iatrogenic effects. Similarly, Vreeman and Carroll (2007) concluded that out of 21 studies which measured direct

behavioural outcomes for bullying perpetration and victimisation, only three showed consistently positive results.

The most recent meta-analysis was conducted by Ttofi and Farrington (2011). The report evaluated 44 published and non-published bullying intervention studies that had investigated trials that included both an intervention and control condition between the years 1983 and 2009. The authors concluded that school based interventions are effective at reducing both bullying perpetration (by 20 to 23 percent) and bullying victimisation (from 17 to 20 percent). This meta-analysis highlights specific programme components that increase intervention effectiveness. The most important elements included parental training and meetings, firm disciplinary methods and cooperative student group work. Interestingly, anti-bullying strategies that included work with peer groups were shown to cause significant increases in victimisation. A similar but non-significant effect was shown for bullying perpetration. Further, anti-bullying programmes were shown to be most effective for children older than 11 years of age; programme effectiveness increased incrementally with age (Ttofi & Farrington, 2011). This conclusion contrasts with a recent publication that concluded that programmes based in secondary schools are less effective due to the larger size of these schools and the less personal nature of the student-teacher relationship (Smith, 2010). However, Ttofi and Farrington (2011) postulate that the superior cognitive abilities of adolescents will enable participants to better respond to the social learning principles inherent in many intervention programmes, which require students to build empathy and perspective taking skills.

The manner in which victims respond to bullying may determine their risk for future victimisation (Schwartz, 2000; Espelage, Bosworth, & Simon, 2001). For this reason those interventions which focus on teaching victims of bullying the social and emotional skills to allow them to respond calmly and assertively to bullying (e.g. Frey et al., 2005; 2009) may help victims to regulate their emotions better and thereby minimise the risk of future victimisation. As highlighted within previous sections of this literature review, victimisation is affected by individual differences (e.g. Bollmer et al., 2006). Accordingly, anti-bullying interventions may benefit from a targeted approach. Few studies however utilise a targeted approach, preferring instead the 'whole-school' model (described within the alcohol intervention section above).

The whole-school intervention model recognises bullying to be a multi faceted, systemic problem that should be approached at different levels, targeting the schools, classroom, individual and families (Smith, Schneider, Smith, & Ananiadou, 2004). Arguments in favour of whole-school approaches to bullying interventions include the lack of labelling and therefore stigmatisation of youth (Stevens, Bourdeaudhuij, & Van Oost, 2001; Smith et al., 2003; Vreeman & Carroll, 2007; Rigby & Slee, 2008), as well as the active utilisation of parents, students and teachers in order to implement school policies, procedures and curricula (Cross et al., 2003). However, this approach has so far produced inconsistent results and is thought to be strongly dependent on programme implementation (e.g. Whitney, Rivers, Smith, & Sharp, 1994; Roland, 2000; Vreeman & Carroll, 2007). Ttofi and Farrington's meta-analysis (2011), showed that the whole-school intervention model be significantly reduced levels of bullying perpetration, but was not related to decreases in victimisation rates. It seems that whole-school interventions which target school and classroom attitudes towards bullying have a greater ability to reduce perpetration (e.g. Olweus, 2004), whilst targeted interventions may show greater efficacy to decrease bullying victimisation (e.g. Jenson & Dieterich, 2007).

Subsequently, efficacy for bullying interventions may be increased by targeting both risk and protective factors for bullying (Jenson & Fraser, 2006). In support of this conclusion, Ferguson and colleagues (2007) conducted a meta-analysis of 42 published intervention studies. Using a combined sample of 34,713 students, results showed an overall significant intervention effect for the reduction of bullying behaviours, with the percentage of change ranging from less than 1 percent for low-risk students, to 3.6 percent for those 'at risk' for perpetrating bullying behaviour (Ferguson et al., 2007). The increased effect seen for higher risk students, suggests greater efficacy for interventions which are targeted towards specific at risk or vulnerable groups.

Few studies however have trialled interventions that target risk factors associated with victimisation, or those adolescents most vulnerable for victimisation, even though specific characteristics have been implicated in risk (e.g. Pepler, Craig, & Roberts, 1998; Karatzias et al., 2002; Bollmer et al., 2006; Ball et al., 2008). In a small study of 46 anxious male victims in grades 7 to 10, targeted interventions were administered that focused upon internalising behaviours, emotional regulation, coping behaviours and



social skills. Results showed that whilst there was no evidence for a direct reduction in frequency of victimisation, the intervention reduced the likelihood of victims exhibiting emotional symptoms, i.e. public crying in response to victimisation. Parental reports suggested that these targeted interventions increased resilience against future victimisation by focusing upon improving anxiety management and coping skills (Berry & Hunt, 2009).

Ttofi and Farrington (2011) conclude their meta-analysis with a call for further research into bullying interventions. Whilst the whole-school approach does include many beneficial elements, these studies are affected by implementation strategies and seem to differ depending on the schools and country in which the programme is trialled. Further, in attempting to capture the entire school population, these programmes are at risk for delivering a generic strategy that does not capture the specific needs of those most vulnerable for victimisation.

#### *Concluding remarks regarding intervention studies*

The previous section of this literature review has highlighted three important factors in the risk for onset, chronicity and consequences of victimisation: personality, coping and emotion regulation. Accordingly, a coping-skills programme that focuses on these differential risk factors, may teach victims the skills to help them deal better with peer conflict and thereby decrease their vulnerability for future victimisation. According to the literature presented above for comorbidity between victimisation and alcohol-misuse, these two problematic outcomes may exacerbate one another, but they may also share common underlying factors relating to personality and coping. Accordingly, interventions may not need to be restricted to an anti-bullying focus. Indeed, behavioural interventions which are more universal in nature, may be able to target specific bullying victimisation problems, as well as associated adverse consequences (such as alcohol-misuse).

The Preventure and Adventure trials administered targeted interventions for 'high-risk' students categorised by their personality characteristics. These trials have proven successful in reducing specific risky behaviours or mental health outcomes associated with different personality characteristics. For example, the Preventure trial has been shown to reduce shoplifting rates for 'impulsive' adolescents; decrease depression rates

for participants scoring high for 'hopelessness'; reduce panic attacks and school avoidance for 'anxiety-sensitive' participants; and prevent binge-drinking for 'sensation-seekers' (Conrod et al., 2008).

One of the main criticisms within the literature for previously published anti-bullying interventions is the difficulty for replication across implementation strategies and countries. This personality-targeted approach to intervention seems to address these issues. The Preventure project has been shown to prevent the growth of alcohol and substance-misuse, within both the UK and North America (Conrod, Stewart, Comeau, & Maclean, 2006; Conrod et al., 2008; Conrod, Castellanos-Ryan, & Strang, 2010). Importantly, the results on alcohol-misuse have recently been replicated within the Adventure trial, which utilises a differential model for implementation; Adventure trains teachers to administer the programme, whilst Preventure uses therapists (O'Leary-Barrett, Mackie, Castellanos-Ryan, Al-Khudhairy, & Conrod, 2010). Similarly to Preventure, the Adventure trial has also been shown to significantly reduce mental health problems in 'at-risk' youth (O'Leary-Barrett et al., submitted manuscript), as well as to positively decrease alcohol and drug use in non-targeted youth (Conrod et al., submitted manuscript). As such, targeting personality vulnerabilities has been shown to significantly prevent against both internalising and externalising problems for both high and low risk youth. Importantly, these trials have been shown to be robust to cultural and implementation differences. Although these programmes target specific risk factors associated with victimisation, the affect of these trials on victimisation and its associated consequences has never been investigated.

### **Aims and hypotheses**

The six empirical studies included within this thesis will aim to address the demonstrated gap in the literature with respect to the functional relationship between adolescent bullying victimisation and alcohol-misuse.

1) Are bullying victimisation and alcohol-misuse comorbid and is this due to a causal model or common underlying mechanism model of comorbidity?

In assessing the causal model for comorbidity the following questions will be addressed:

- Is victimisation predictive of the development of alcohol-related problems?
- Is victimisation predictive of an increase in alcohol consumption levels?
- Is victimisation predictive of the development of coping-drinking motives?
- Are coping-drinking motives related to an increase in alcohol-related problems?
- Are coping-drinking motives related to an increase in alcohol consumption levels?
- Do coping-drinking motives mediate the relationship between victimisation and alcohol-misuse?

Based on the model by Cooper (1995) that showed a pathway from negative emotions to alcohol-related problems, through the development of coping-drinking motives, it is hypothesised that:

- a) Evidence will show support for a causal model for comorbidity: bullying victimisation will predict the development of both coping-drinking motives and alcohol-related problems;
- b) the relationship between victimisation and alcohol-related problems will be mediated by the development of coping-drinking motives, but not by other drinking motives (i.e. enhancement, social and conformity motives).

In assessing the common underlying mechanism model for comorbidity, the following questions will be addressed:

- Do lower order neurotic personality domains, which have already been shown to predict alcohol-misuse, also predict an increased risk for bullying victimisation?
- Do these lower order neurotic personality domains predict the development of behaviours associated with maladaptive emotional expression (e.g. displaying excessive worrying; feeling tearful, etc)?
- Using the literature which has shown a functional relationship between PTSD and alcohol-misuse as a foundation, do increases in emotional symptoms predict an increased risk for future victimisation?
- Do emotional symptoms mediate the independent relationships between the two lower order neurotic personality domains and future victimisation?
- In what way are the 'hopelessness' and 'anxiety-sensitivity' personality domains directly involved in the relationship between bullying victimisation and alcohol-

misuse: do they act to mediate or moderate the relationship? Do they act similarly or display differential roles within this relationship?

Using the literature which has shown a relationship between trauma and the development of extreme negative emotion (in the form of PTSD) and neurotic personality vulnerabilities, it is hypothesised that:

- a) Higher levels of anxiety-sensitivity and hopelessness will predict victimisation;
- b) higher levels of emotional symptoms will predict victimisation;
- c) the relationship between anxiety-sensitivity and hopelessness to victimisation; will be mediated by the development of emotional symptoms (i.e. crying, running away, etc);
- d) both 'hopelessness' and 'anxiety-sensitivity' will be implicated in the direct relationship between bullying victimisation and alcohol-misuse.

2) Do victims of bullying show hypervigilance for threat related emotional face stimuli?

- Do victims of bullying show increased levels of emotional vigilance in comparison to an uninvolved control group of adolescents at a cognitive level?
- Do victims of bullying show differential emotional vigilance in comparison to adolescents exposed to a life-time trauma at a cognitive level?
- Do victims show increased levels of emotional vigilance to angry faces, in comparison to an uninvolved control group of adolescents at a neural level (in specific regions of interest)?
- Do victims show increased levels of emotional vigilance to ambiguous faces, in comparison to an uninvolved control group of adolescents at a neural level (in specific regions of interest)?
- Are victims' increased emotional symptoms associated with the neurological response to threatening and ambiguous social cues?

Based on previous literature showing responses to threat from those people who have been exposed to a lifetime trauma, it is hypothesised that:

- a) Victims of bullying will show a cognitive hypervigilance for fearful and sad face stimuli when presented in the context of threat (i.e. anger), in comparison to their uninvolved peers;

- b) indirect support will be lent towards the causation model for comorbidity, by showing that victims of bullying will not differ in levels of cognitive vigilance to emotional face stimuli, in comparison to those adolescents who have been exposed to an extreme lifetime trauma;
  - c) victims will differ to their uninvolved peers in neural activation levels in response to threat and ambiguous face stimuli, within specific a-priori neural regions of interest (which include both cognitive and emotional brain centres);
  - d) increased levels of emotional symptoms will be associated with increased neural activation in response to threatening social cues for victims, rather than uninvolved 'control' adolescents.
- 3) Are personality-targeted interventions effective for decreasing both levels of victimisation and alcohol-misuse in a subgroup of adolescent victims?

With regards to victimisation levels, the following questions will be addressed:

- Do personality-targeted interventions decrease victimisation levels over an 18-month period?
- Are the effects of the intervention specific to those adolescents who score highly for a particular personality domain (i.e. anxiety-sensitivity or hopelessness?)
- Do personality-targeted interventions act to reduce avoidant coping strategies?
- Do personality-targeted interventions act to increase positive or active coping strategies?
- Can the effects of these interventions on victimisation be replicated in a trial that administered identical intervention workshops that were implemented by teachers rather than therapists?

It is hypothesised that:

- a) personality-targeted interventions will reduce victimisation specifically for those adolescents who score highly for anxiety-sensitivity and hopelessness;
- b) personality-targeted interventions will reduce avoidant coping strategies specifically for those adolescents who score highly for anxiety-sensitivity and hopelessness;

- c) personality-targeted interventions will increase positive/active coping strategies specifically for those adolescents who score highly for anxiety-sensitivity and hopelessness.

With regards to alcohol-misuse, the following questions will be addressed:

- Do personality-targeted interventions decrease coping-drinking motives specifically for victims of bullying over an 18-month period?
- Do personality-targeted interventions decrease alcohol-related problems specifically for victims of bullying over an 18-month period?

## **Chapter 2: METHODOLOGY**

### **Study design and approach**

In order to address the research questions outlined for this thesis, data from three independent studies will be utilised: the Preventure study; the Adventure trial; and the IMAGEN project. This chapter will outline the methodology and research instruments employed in each of these studies.

### **2.1 THE PREVENTURE STUDY**

#### *2.1.1 Overview of study*

The Preventure study is a longitudinal project, spanning 24 months that delivered personality-targeted Cognitive Behavioural Therapy (CBT) interventions to secondary school students classified as ‘high personality risk’ between 2005 to 2007. Selected students within each school were randomised to either the ‘intervention’ or ‘non-intervention control’ conditions. The programme assessed students for risk on one or more of four different personality risk domains (i.e. hopelessness, ‘anxiety-sensitivity’, sensation seeking and impulsivity: see the ‘procedure’ section 2.1.5 below for more detail). Four different CBT interventions were conducted that were targeted towards one of the four personality domains (i.e. a student identified as at risk for ‘anxiety-sensitivity’, if randomised to the intervention condition, was invited to take part in a CBT workshop specified to ‘anxiety-sensitivity’ personality vulnerabilities). The interventions were conducted by fully qualified therapists. Following screening for personality, those students who were identified as ‘high personality risk’ were invited to take part in the follow-up stage of the study.

#### *2.1.2 Participants*

Participants, aged 13 to 16 years old were recruited as part of a study called Preventure (Castellanos & Conrod, 2006; Conrod et al., 2008; Conrod et al., 2010) (see figure 2.1 below). Twenty-four secondary schools were recruited to take part in this project by initially contacting the school administrators. All secondary schools which were located in 11 of the 33 London boroughs were sent information by post about the project. Boroughs were selected based on proximity to the Institute of Psychiatry,

King's College London, where the research team was based (see Conrod, Castellanos & Strang, 2010, for more information). Schools which agreed to take part in the project were all state funded schools. With their permission, whole year groups (academic years 9 to 11) were invited to take part in initial screening surveys at baseline. Whilst the full Preventure sample totalled 806 adolescents, data on bullying victimisation was only available from baseline for 688 participants, of which 69 percent were female (mean age=13.84, sd=.75). Participants came from a variety of ethnic backgrounds: 37.8 percent identified as white British (or white other); 10.9 percent identified as mixed race; 11.3 percent identified as Asian; 32.3 percent identified as Black; and 6.7 percent identified as 'other'. With regards to Social Economic Status (SES), the Preventure sample was below average for weekly income in comparison to the London population (this information was collected as an addition to the Conrod et al, 2010 paper and used data from the Office of National Statistics for the period 2004-2005 to contrast to participants' average weekly income rates by ward, using the website: [www.neighbourhood.statistics.gov.uk](http://www.neighbourhood.statistics.gov.uk)).

### *2.1.3 Exclusions*

At the data analysis stage, participants were excluded at each time point if their data were deemed unreliable. Examples of unreliable data include answering positively to a sham drug question, and/or the detection of nonsensical answering.

### *2.1.4 Ethical Procedure*

Participation in both the initial survey and follow-up phases of the project was voluntary and involved both informed assent by participants and active (i.e. opt-in) parental consent. This study was approved by the Joint South London and Maudsley and the Institute of Psychiatry NHS Research Ethics Committee. Parental and student consent were obtained at the start of each study. Confidentiality was guaranteed and it was emphasised that schools and parents would not have access to data.

### *2.1.5 Procedure*

The initial survey was carried out during class time by trained research assistants (with familiar teachers present). All consenting students were asked to complete a self-report questionnaire booklet, which consisted of a battery of measures on topics including personality risk, victimisation from bullying, alcohol-related problems, emotional



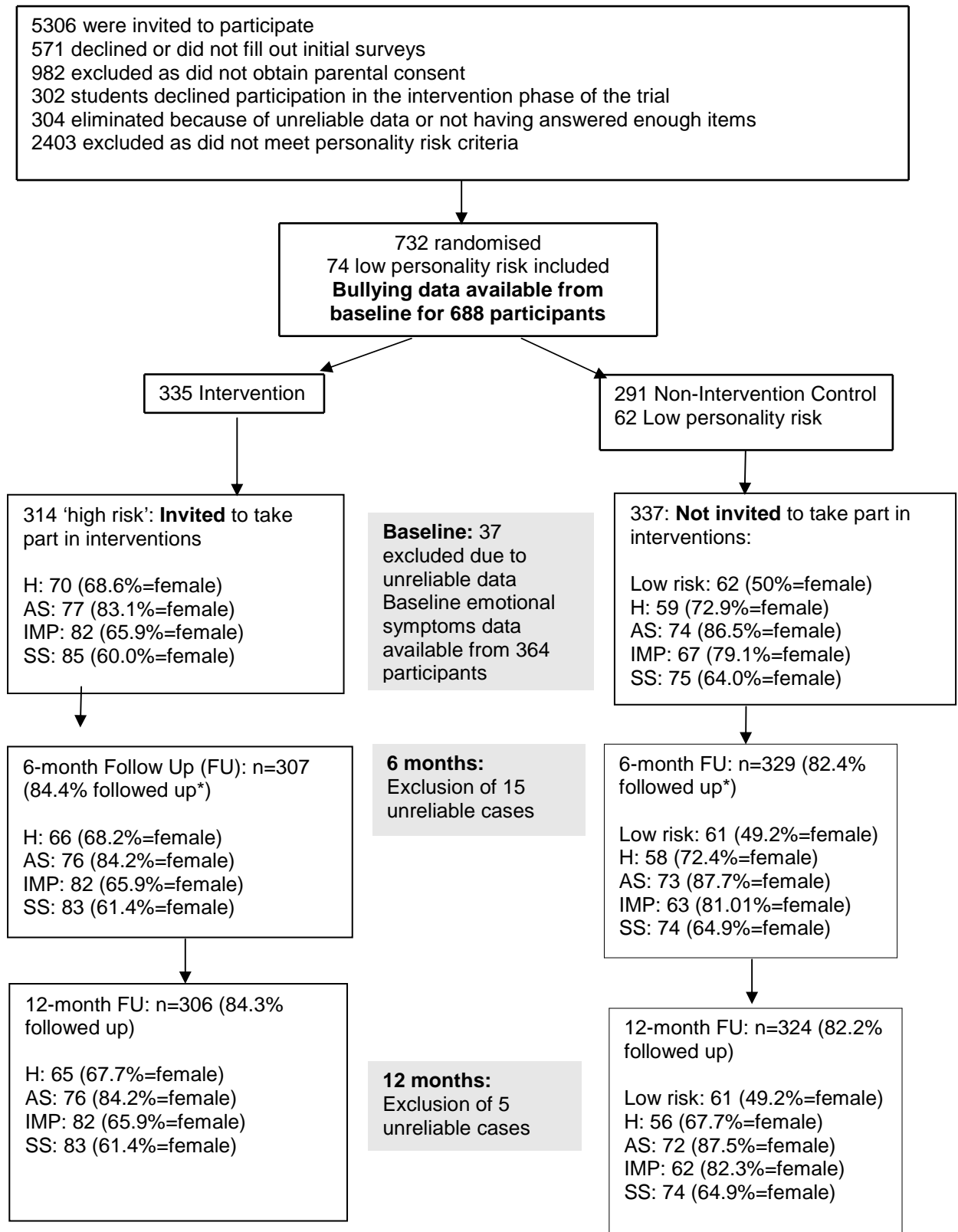
symptoms and motivations for drinking. The entire booklet took approximately 45 minutes to complete.

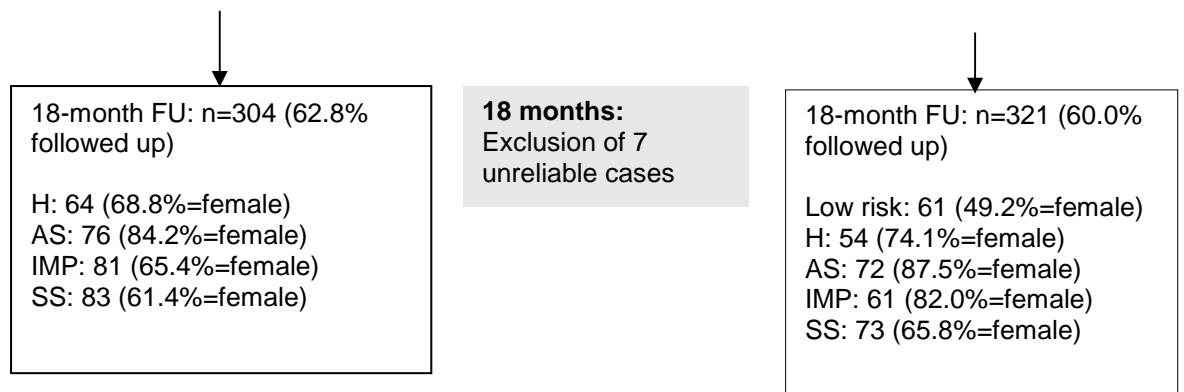
Students were categorised as either high or low personality risk according to their scores on the Substance-Use Risk Personality Scale' (SURPS, Woicik et al., 2009) (see the 'Measures' section below for more information). High personality risk students were those who scored one standard deviation or more above their school mean on at least one of the four personality risk profiles (i.e. hopelessness, 'anxiety-sensitivity', sensation seeking and impulsivity, which are all subscales of the SURPS). All high personality risk students were invited to take part in the follow-up stage of the study.

Within each school, participants were randomly divided into two groups: intervention (n=335) and non-intervention control (n=291). Randomisation procedures involved asking students to pick a piece of paper out of a box, which had either 'workshop', or 'control' written on it. There were four different intervention workshops within each school; one for each of the four personality 'risk' domains; students who were randomised to the intervention condition were included within the personality-targeted workshop for which they scored highly; i.e. those students who scored high for 'anxiety-sensitivity' were included in the anxiety-sensitivity-targeted CBT workshop. If a student scored high on more than one subscale, they were assigned to the personality group for which they showed the most statistical deviance according to z-scores. Additionally, a random normative group of 'low personality risk' students (n=74) who scored low (i.e. one standard deviation below their school mean) on all four personality risk subscales, were invited to take part in the follow-up stage of the study; although only those students classified as high personality risk were invited to take part in the intervention workshops.

Data were collected from all selected participants every six months for two years post interventions (which occurred after the initial baseline assessment). Follow-up assessments followed the same procedure as baseline and were conducted by research assistants who were blind to treatment condition. Follow-up assessments were completed by students during class time at the school that they were initially surveyed at. For those students who were absent on the assessment days, or who no longer attended the same school, the follow-up questionnaires were posted out to their home

addresses and returned by post. This thesis will report on data collected from the first four time points: baseline, 6, 12 and 18-months.





**NB: Explanation of chapter samples**

Chapter 3: data from baseline to 12 months, includes control group only

Chapter 4: data from baseline to 18 months, included only those for whom baseline emotional symptoms available, control group only

Chapter 7: data from baseline to 18 months, included only those for whom baseline emotional symptoms available, intervention and control groups (not including low personality risk group)

Chapter 9: data from baseline to 18 months, intervention and control groups (not including low personality risk

**Figure 2.1 Recruitment flow chart for the Preventure study**

### 2.1.6 Assignment to Behavioural Groups

In order to assess the effect of the CBT interventions in preventing against alcohol-related problems, specifically for victims of bullying, students were categorised into two groups: victims and non-victims for analyses conducted in Chapter 8 of this thesis. Victims were categorised as those adolescents who had experienced one or more of three types of victimisation acts (described in the ‘Measures’ section below in more detail), at least two or three times per month in the past six months. This categorisation procedure followed guidelines set out by Olweus (2010). For the purpose of these analyses, and in order to achieve a high level of statistical power by maintaining a large sample size, all students who did not meet this criteria were classified as ‘non-victims’

### 2.1.7 Measures

The following measures were administered at all four time points: baseline, 6, 12 and 18-months:

#### *2.1.7.1 Demographic Questionnaire*

This questionnaire was based on a measure created by Stewart and Devine (2000). Using a forced-choice answering procedure, participants were asked to provide information on their age, gender, current grade level in school, and their ethnicity.

#### *2.1.7.2 Personality Assessment*

‘anxiety-sensitivity’ and hopelessness were assessed using the Substance-use Risk Profile Scale (SURPS, Conrod & Woicik, 2002; Woicik et al., 2009) (see Appendix II). The SURPS is a 23-item questionnaire which assesses four personality risk factors for substance use: hopelessness, ‘anxiety-sensitivity’, sensation seeking, and impulsivity. This scale, although developed to assess risk for substance abuse has been shown to be sensitive to personality-based individual differences in response to threatening and painful stimuli (Conrod, 2006) as well as in personality-targeted CBT interventions (Conrod et al., 2006). The ‘anxiety-sensitivity’ subscale was measured using five items (e.g. It’s frightening when I feel dizzy or faint; I get scared when I experience unusual body sensations; it scares me when I am unable to focus on a task). The Hopelessness subscale was measured using seven items (e.g. I am content or satisfied with life in general; I feel proud of my accomplishments; I am very enthusiastic about my future). For each item within both subscales, participants indicated on a four point scale the extent to which they agreed with the statements about themselves (1= ‘strongly disagree’; 2= ‘disagree’; 3= ‘agree’; 4= ‘strongly agree’).

The four personality domains of the SURPS have been derived from the broader personality domains of neuroticism and extraversion (Conrod, Pihl, Stewart, & Dongier, 2000; Castellanos-Ryan & Conrod, in press), with the initial aim to address specific risk pathways to substance use. The five personality dimensions of the NEO-FFI-R (Costa & McCrae, 1992) are not specified for the development of risky behaviours and are as a consequence broad in their definitions. The broad categorisation of neuroticism within the ‘Big Five’ model of personality therefore does not allow for analysis of specific vulnerabilities (such as differences which exist between anxiety and depression). Evidence in the literature indicates that specific rather than general personality traits best predict vulnerabilities for behaviours and psychopathology. For example, ‘anxiety-sensitivity’, which is a construct within neuroticism, has been shown to have incremental validity over the broad neuroticism domain in identifying people at risk for

panic disorder (Cox, Enns, Walker, Kjernisted, & Pidlubny, 2001). Consequently, the distinction between the lower-order personality domains of hopelessness and anxiety-sensitive within the SURPS, allows for separate investigations into depressive and anxiety related personality vulnerabilities in relation to victimisation and alcohol-use.

The SURPS has been shown to have good concurrent, predictive and incremental validity (Woicik et al., 2009). Woicik and colleagues (2009) demonstrated that each of the four SURPS subscales correlated with widely recognised personality and symptom measures. The internalising domains of hopelessness and ‘anxiety-sensitivity’ were shown to positively correlate with other well validated measures. The ‘hopelessness’ subscale was shown to positively correlate with adult measures of hopelessness (e.g. the Beck Hopelessness Scale), as well as to depressive symptoms in adolescents. The ‘anxiety-sensitivity’ subscale of the SURPS was shown to positively correlated with two other validated measures of ‘anxiety-sensitivity’ (Silverman, Fleisig, Rabian, & Peterson, 1991; Peterson et al., 1992). The SURPS’ ‘hopelessness’ and ‘anxiety-sensitivity’ domains are derived from, and are considered to be lower order facets of the broader neuroticism personality domain within the NEO Five Factor Inventory (NEO-FFI) (Costa & McCrae, 1992). Due to increased specificity, they are thought to be more proximal to specific patterns of psychopathology (see review by Conrod et al., 2000). Within the present sample, baseline personality scores will be reported. Both the ‘hopelessness’ and ‘anxiety-sensitivity’ subscales showed good internal reliability for short scales (Hopelessness:  $\alpha = .78$  (7 items), ‘anxiety-sensitivity’:  $\alpha = .65$  (5 items)).

#### *2.1.7.3 Bullying Victimisation Questionnaire*

Adolescent victimisation from bullying was assessed using a ‘bullying questionnaire’ measure amended from questions used in the large international study entitled: Health Behaviour in School-aged Children (HBSC) study (see Currie et al., 2008); which were originally taken from the Revised Olweus Bully/Victim Scale (Olweus, 1996) (see Appendix V).

Participants were provided with a definition of victimisation: “*We say a student is BEING BULLIED when a student or group of students say or do nasty and unpleasant things to him or her. It is also bullying when a student is teased repeatedly in a way he or she does not like or when they are deliberately left out of things*”.

The questionnaire consisted of three-items; one for each of the three included types of victimisation: verbal, relational and physical bullying. Verbal victimisation was assessed using the item: 'I was called mean names, was made fun of, or teased in a hurtful way'; relational victimisation was assessed using the item: 'other students left me out of things on purpose, excluded me from their group of friends or completely ignored me'; physical victimisation was assessed using the item: 'I was hit, kicked, pushed shoved around, or locked indoors'. For each item participants indicated on a 5-point scale (1=never, 2=only once or twice, 3=two or three times a month, 4=about once a week, 5=several times a week) how often they had experienced that type of victimisation within the past six months.

A self-report questionnaire for measuring bullying victimisation has been chosen due to a consideration of the merits of self-report over other common methods, such as peer nominations. It has been argued that these two methodologies tap into different constructs of subjective self views (self-report) and social reputation (peer nomination) (Juvonen, Nishina, & Graham, 2001). Due to a reliance on social reputation, peer nominations are thought to be relatively stable over time. Contrastingly, self-reports are designed to measure less stable characteristics and therefore may be more suitable within this thesis, which will assess the change in levels of victimisation over time. Further, this method allows categorisation of victim groups based on frequency of victimisation over time, rather than the number of peer nominations received; which could be influenced by the size of the class and the fixed number of nominations the students are asked to provide. Self-report methods also tap into bullying which may not be known to peers, due to its secretive nature and victims not always confiding in others (Olweus, 1993).

For the analyses in Chapters 3, 4 and 7, the victimisation items were combined to create a composite 'frequency of victimisation' variable and treated as a continuous score. For analyses in Chapter 8, the three victimisation items were used to categorise two groups of victims and non-victims (see the 'Assignment to behavioural groups' section 2.1.6 above for more information on categorisation).

Internal reliability showed good reliability at baseline, 6 and 12-months follow-up (baseline:  $\alpha=.67$ ; six months:  $\alpha=.68$ ; 12-months:  $\alpha=.69$ ). The internal reliability for 18-

months was less than adequate ( $\alpha=.49$ ), however, it has been argued that this form of reliability analysis, which is based on alpha coefficients that are highly influenced by the number of items included in the scale, is more likely to achieve lower values for short scales (this scale consisted of three items), yet does not necessarily reflect bad reliability (Nunnally, 1976).

#### *2.1.7.4 Emotional Symptoms*

Emotional symptoms were assessed using the ‘Strengths and Difficulties Questionnaire’ (SDQ, Goodman, 1997) (see Appendix VI). The SDQ is a 25 item measure that assesses five aspects of behaviours, which can be linked to different psychopathologies: emotional symptoms, conduct problems, hyperactivity/inattention, peer-problems and pro-social behaviour. For each item participants are asked to indicate on a three-point scale the extent to which the statements reflect their own behaviour over the past six months (1=not true, 2=somewhat true, 3=certainly true). For the purposes of the current analyses, only the emotional symptoms scale will be investigated. Five items are used to assess emotional symptoms, that include physiological complaints, negative affect and anxiety-proneness (i.e. ‘I get a lot of headaches, stomach-aches or sickness’; ‘I worry a lot’; ‘I am often unhappy, downhearted or tearful’; ‘I am nervous in new situations’; ‘I have many fears, I am easily scared’).

The SDQ is suitable for use with adolescents aged 11 to 16 years and has been shown to be a reliable and well validated measure of adolescent emotional and behavioural symptoms (Goodman, 2001). This emotional symptoms subscale has been well validated and has been associated with depressive, phobic and anxiety related DSM-IV (APA, 1994) diagnoses (Goodman, 2001). Scores for the five emotional symptoms were combined to create a composite emotional symptoms total score at both baseline and 6 month follow-up. Internal reliability was good at both baseline and six months for short subscales (baseline:  $\alpha=.70$ ; six months:  $\alpha=.68$ ).

#### *2.1.7.5 Coping Strategies*

Positive and avoidant coping strategies were measured within the Preventure sample using items taken from the COPE questionnaire (Carver, Scheier, & Weintraub, 1989) (see Appendix III). The COPE questionnaire is made up of 20 items, which assess different responses to stress. A positive coping scale was derived from 14 items

measuring coping strategies including: active coping; planning; seeking social support; positive reinforcement; acceptance; and religion (examples of items include: 'I've been concentrating my efforts on doing something about the situation'; 'I've been trying to come up with a strategy about what to do'; 'I've been getting help and advice from other people'; 'I've been trying to find comfort in my religion or spiritual beliefs').

Avoidance coping was derived from eight items making up the denial, behavioural disengagement, mental disengagement and alcohol disengagement subscales (examples of items include: 'I've been saying to myself "this isn't real"; 'I've been giving up trying to deal with it'; 'I've been using alcohol or other drugs to make myself feel better'). For each item participants are asked to indicate on a four-point scale the extent to which they had engaged in each behaviour in order to deal with their problems over the past six months (1=I haven't been doing this at all, 2=I've been doing this a little bit, 3=I have been doing this a medium amount, 4=I have been doing this a lot). Internal reliability was good at all four time points for both the positive and avoidance coping subscales (positive coping: baseline:  $\alpha=.88$ ; six months,  $\alpha=.89$ ; 12-months,  $\alpha=.90$ ; 18-months,  $\alpha=.89$ . Avoidance coping: baseline,  $\alpha=.78$ ; six months,  $\alpha=.77$ ; 12-months,  $\alpha=.77$ ; 18-months,  $\alpha=.74$ ).

#### *2.1.7.6 Alcohol Consumption Levels*

Alcohol consumption was assessed using a composite score of two self-report items measuring the quantity and frequency (QxF) of alcohol-use. Drinking quantity was measured by asking participants to report the number of standard alcoholic beverages that they consumed on a typical drinking day during the past six months. Participants were asked to indicate on a 5-point scale how many drinks containing alcohol that they consume (1=none; 2=one or two; 3=three or four; 4=five or six; 5=seven to nine; 6=ten or more). Drinking frequency was assessed by asking students to report how often they 'usually' drank alcohol over the same 6 month period, by using another 5-point scale (1=never; 2=less than monthly; 3=monthly; 4=weekly; 5=daily).

#### *2.1.7.7 Alcohol-Related Problems*

Alcohol-related problems were assessed using an amended version of the self-report 'Rutgers Alcohol Problem Index' (RAPI, White & Labouvie, 1989) (see Appendix VII). For the purposes of this current study the 23 items of the RAPI were reduced to 7 items



which were revealed in previous analyses to be highly relevant for adolescents (Castellanos, 2009). Only those participants who positively responded to consuming alcohol in the past six months answered the RAPI items. Participants who had not drunk alcohol within the past six months answered 'never' for all questions within this measure. Participants are required to indicate on a 5-point scale (1=never, 2=one to two times, 3=three to four times, 4=five to six times, and 5=more than 6 times) how many times they have experienced negative consequences due to their alcohol-use in the past six months. The seven items within the RAPI assess problem behaviours experienced as a direct consequence of alcohol consumption (examples of items include: 'got into fights, acted bad, or did mean things'; 'noticed a change in my personality'; 'felt I was going crazy'). Scores for the seven alcohol-related problems were combined to create a composite alcohol-related problem total score at all four time points. Internal reliability within this study was strong at all four time points (baseline:  $\alpha=.88$ ; six months:  $\alpha=.87$ ; 12-months:  $\alpha=.87$ ; 18-months:  $\alpha=.89$ ).

#### *2.1.7.8 Drinking Motivations*

Drinking motivations recognise that individuals drink in order to achieve a specific goal and have been described as the final common pathway towards alcohol-use and misuse (Cox & Klinger, 1988) (see Appendix IV). Motivations for drinking can be reliably measured using a scale that distinguishes between those who initiate alcohol-use in order to create a positive consequence, or to pre-empt a negative one. Four identified drinking motives have shown to be empirically independent from one another: conformity (external, negative reinforcement: e.g. to fit in with a group I like); social (external, positive reinforcement: e.g. because it helps me to enjoy a party); coping (internal, negative reinforcement: e.g. to forget my worries); and enhancement (internal, positive reinforcement: e.g. because it's exciting) (Cooper, 1994).

Motives for drinking were therefore assessed using the 'Drinking Motives Questionnaire' (DMQ, Cooper, 1994). The DMQ consists of 20 items used to measure motives for drinking across four independent dimensions: enhancement, social, conformity and coping. Participants who positively responded to consuming alcohol in the past six months answered this self-report questionnaire. Those participants who had not drunk alcohol within the past six months answered 'never' for all questions within this measure. Participants were asked to report how often they drank alcohol for each of

the 20 items using a 5-point scale (1=almost never/never; 2=some of the time; 3=half of the time; 4=most of the time; 5=almost always/always).

This thesis utilised the ‘coping-drinking’ subscale. The five items which assessed coping motives were combined to create a composite ‘coping-drinking motives’ total score. The coping-drinking subscale included items such as: ‘to forget my worries’; ‘to cheer up when I am in a bad mood’; ‘because it helps when I am depressed or nervous’. Total scores for the other three subscales (enhancement, social and conformity drinking motives) were used as covariate variables in analyses within this thesis. A strong body of literature supports the reliability and validity of the use of this scale to assess adolescent drinking motives (Cooper et al., 1995; Stewart & Devine, 2000; Stewart et al., 2001). Internal reliability was strong for the coping motives subscale at all four time points (baseline  $\alpha=0.86$ ; six months  $\alpha=.88$ ; 12-months  $\alpha=0.87$ ; 18-months  $\alpha=.88$ ).

#### *2.1.8 Intervention Workshops*

The brief intervention sessions involved two 90-minute group sessions that were conducted at participants’ schools by a facilitator and co-facilitator. The interventions were carried out by chartered counselling psychologists (MSc in counselling psychology) or experienced special needs teachers (postgraduate diploma in education with specialisation) as well as co-facilitators (masters-level research assistants).

The interventions were originally designed for Canadian youth (Conrod et al., 2006), but were adapted for British youth through the inclusion of real life ‘scenarios’. These scenarios were shared through focus groups by British teenagers (Conrod et al., 2004a,b,c,d) before the commencement of the Preventure study in 2005. Separate focus groups were conducted for each of the four personality domains and consisted of approximately 10 to 15 adolescents.

During the study, four different interventions were conducted by trained therapists using manuals, which were specified for each of the four personality domains. The interventions were based on a CBT model and designed with the intention to change how individuals with specific personality risk-factors cope with their vulnerability. The interventions were conducted in personality specific groups (i.e. 4 separate groups for each of the Hopelessness, Anxiety Sensitivity, Impulsivity and Sensation Seeking

personality domains), utilising psycho-educational, motivational enhancement therapeutic strategies. Real life personality specific ‘scenarios’ were included that had been shared by high personality risk youth in the pre-trial focus groups. The combination of the different intervention strategies aimed to teach participants about their specific personality domain (hopelessness, anxiety-sensitivity, impulsivity, or sensation-seeking) and any associated problematic behaviour (such as avoidance, interpersonal dependence or risky behaviours), and to introduce participants to the different components that make up personal experiences and associated emotional responses (Conrod et al., 2006; Conrod et al., 2008; Conrod et al., 2010). Novel to this strategy was that all exercises discussed emotions, thoughts and behaviours in a personality-specific way. For example, the story of ‘Erin’ is described who scores highly for anxiety-sensitivity. A situation is depicted in which she is afraid to go to a party with her peers. Different maladaptive coping strategies are identified with their longer term consequences discussed; for example, she could avoid the party, but then she would be at risk for becoming socially isolated. In this manner, the interventions aimed to maximise the relevance and impact for each individual.

## **2.2 THE ADVENTURE STUDY**

### *2.2.1 Overview of Study*

The Adventure study is an extension trial to the Preventure study. The Adventure study is a longitudinal trial that spanned 24 months and delivered the same CBT personality-targeted interventions as described for the Preventure study, between the years 2007 to 2009. In contrast to the Preventure study, the Adventure trial used a more cost-effective model by training school teachers to deliver the intervention workshops rather than using qualified CBT therapists. Additionally, whilst the Preventure study randomised *individuals* to either the intervention or ‘non-intervention control’ conditions, Adventure randomised *schools* to one of the two conditions; high personality risk students who were students at a school randomised to the intervention condition, were invited to take part in the intervention workshops. In contrast to the Preventure study, Adventure followed up all students who completed the baseline questionnaires, regardless of personality risk. However, only those students who were enrolled in schools randomised to the intervention condition and who presented with high personality risk were invited to take part in the CBT workshops.

### *2.2.2 Participants*

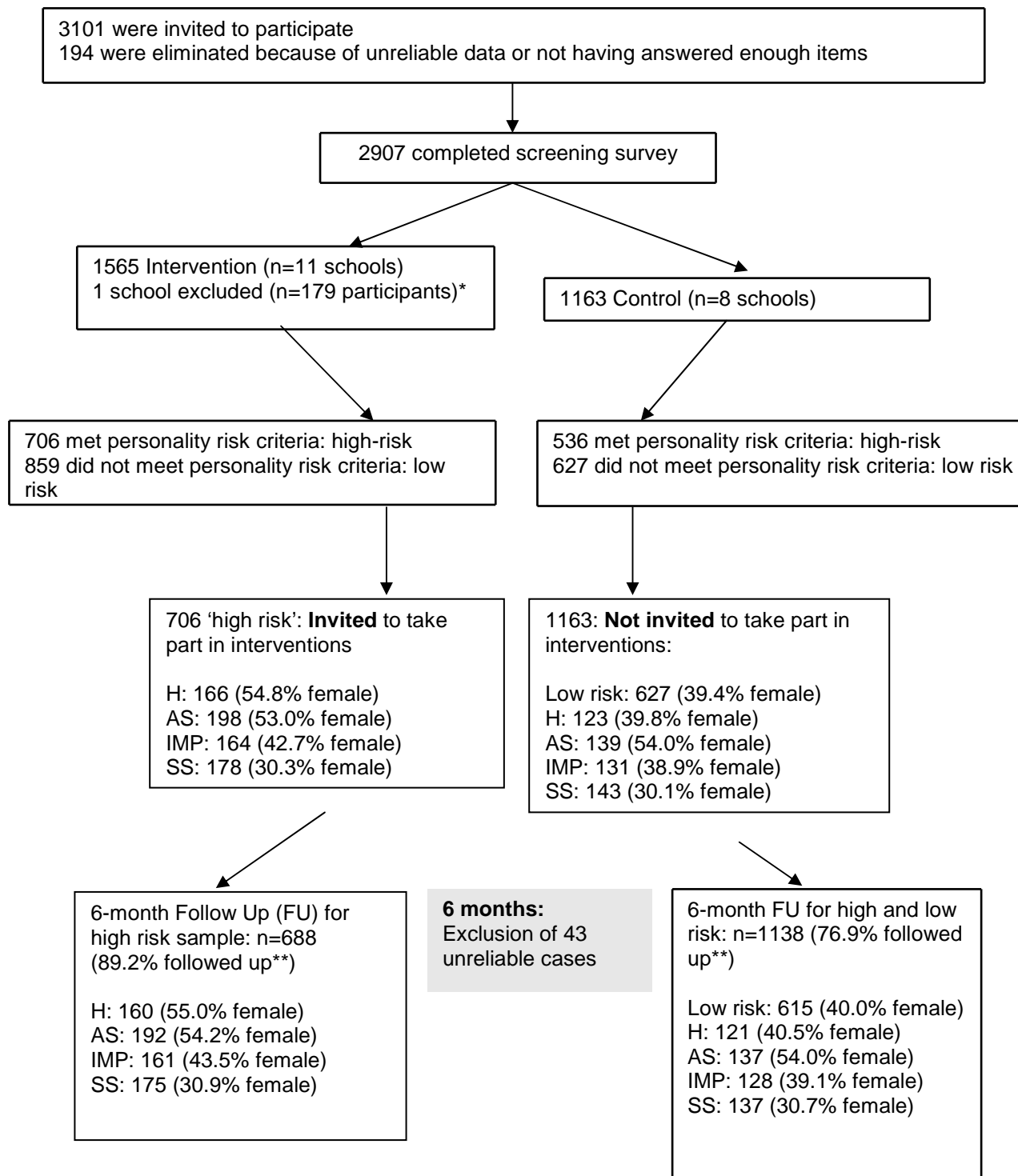
Participants, aged 13 to 14 years old were recruited as part of a study called Adventure (O’Leary-Barrett et al., 2010) (see figure 2.2 below). Twenty-one secondary schools from nine randomly selected London boroughs were recruited to take part in this project by initially contacting the school administrators. With their permission, whole year groups (academic year 9) were invited to take part in initial baseline screening surveys. The full Adventure sample totalled 2643 adolescents at baseline, of which 58 percent were male (mean age=13.69, sd=.44). Participants came from a variety of ethnic backgrounds: 41.7 percent identified as white British (or white other); 8.4 percent identified as mixed race; 28.6 percent identified as South Asian; 15.7 percent identified as Black; and 5.6 percent identified as ‘other’.

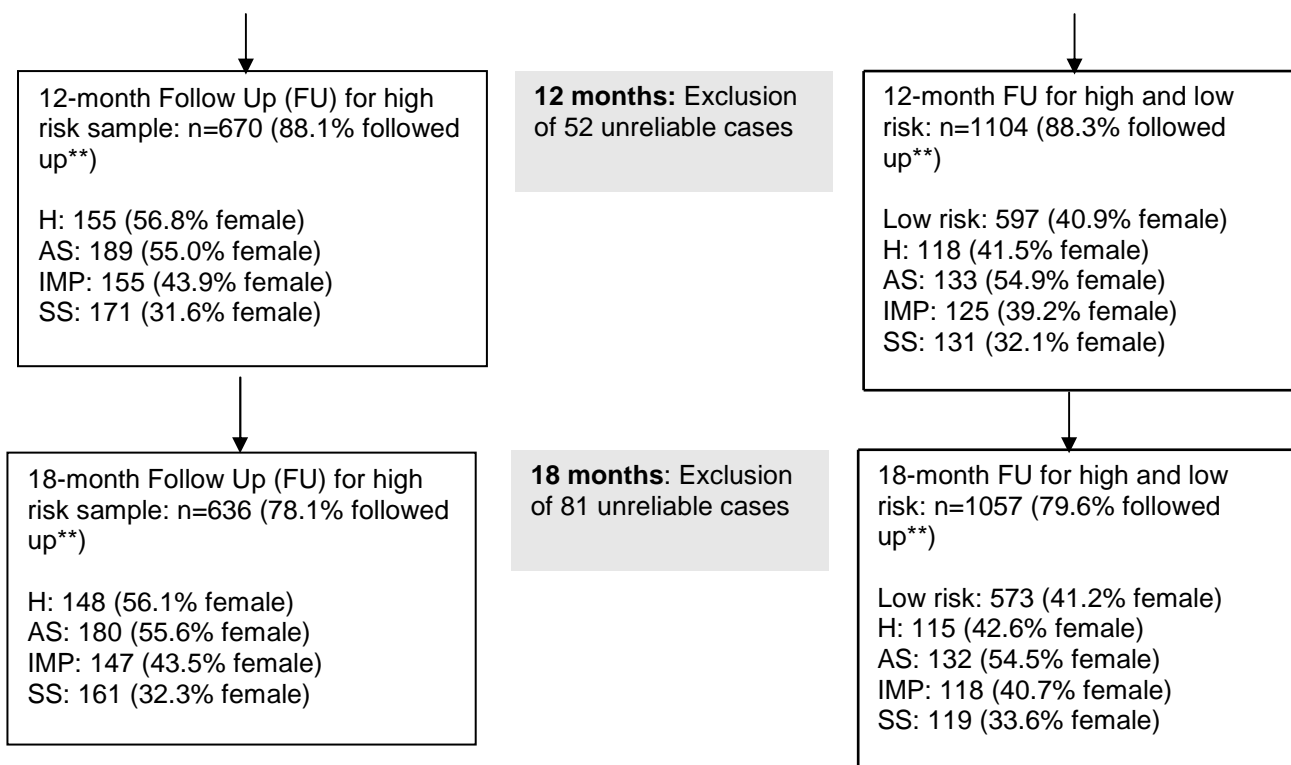
### *2.2.3 Exclusions*

At the data analysis stage, participants were excluded at each time point if their data were deemed unreliable. Examples of unreliable data include answering positively to a sham drug question, and/or the detection of nonsensical answering. One non-intervention control school (n=144 participants) was unable to organise the 6 month follow-up survey. This school remained in the trial but was excluded from the present analyses.

### *2.2.4 Ethical Procedure*

Participation in both the initial survey and follow-up phases of the project was voluntary. In order to reduce attrition rates, passive (i.e. opt-out) parental consent together with active student assent were obtained at the start of the study. Confidentiality was guaranteed and it was emphasised that schools and parents would not have access to data. This study was approved by the Joint South London and Maudsley and the Institute of Psychiatry NHS Research Ethics Committee.





\* One intervention school excluded due to inability to organise intervention groups for each personality type

\*\* Data imputed for participants not followed up

#### Explanation of chapter samples

Chapter 4: data from baseline to 18 months, for control group only. A further control school excluded from analyses due to withdrawing after the baseline assessment (n=123 participants).

Chapter 7: data from baseline to 18 months, includes the high risk participants only from both intervention and control groups.

**Figure 2.2 Recruitment flow chart for the Adventure study**

### *2.2.5 Procedure*

In contrast to the Preventure study, schools were recruited and then randomised to either the ‘intervention’ or ‘non-intervention control’ conditions. The initial survey was carried out during class time by trained research assistants (with familiar teachers present). All consented students were asked to complete a self-report questionnaire booklet, which consisted of a battery of measures on topics including personality risk, victimisation from bullying, alcohol-related problems, emotional symptoms and motivations for drinking. The entire booklet took approximately 45 minutes to complete.

Categorisation of participants to either high or low personality risk followed the same procedure as described above for the Preventure study. Students were categorised as either high or low personality risk according to their scores on the Substance-Use Risk Personality Scale’ (SURPS). Those participants who were classified as ‘high personality risk’ and who were students in the schools randomised to the intervention condition, were invited to take part in the CBT workshops. In contrast to the Preventure study, all consented year 9 students from both intervention and ‘non-intervention control’ schools were invited to take part in the follow-up stage of the study.

The procedure for the intervention workshops worked in the same way as described previously for the Preventure study. There were four different intervention workshops within each ‘intervention’ school; one for each of the four personality ‘risk’ domains. High risk students within the intervention schools were included within the personality-targeted workshop for which they scored highest. Data were collected from all participants (high and low personality risk from both ‘intervention’ and ‘non-intervention control’ schools) every six months for two years post interventions (which occurred after the initial baseline assessment). Follow-up assessments followed the same procedure as baseline and were conducted by research assistants who were blind to treatment condition. Follow-up assessments were completed by students during class time at the school that they were initially surveyed at. For those students who were absent on the assessment days, or who no longer attended the same school, the follow-up questionnaires were posted out to their home addresses and returned by post. This thesis will report on data collected from the first four time points: baseline, 6, 12 and 18-months.

### *2.2.6 Measures*

The measures used for the Adventure study were the same as those described above for the Preventure. Similarly to Preventure, measures were administered at all four time points: baseline, 6, 12 and 18-months. A brief list of the relevant measures is included below (see the previous Preventure measures section for more detail):

#### *2.2.6.1 Demographic Questionnaire*

This questionnaire was based on a measure created by Stewart and Devine (2000). Using a forced-choice answering procedure, participants were asked to provide information on their age, gender, current grade level in school, and their ethnicity.

#### *2.2.6.2 Personality Assessment*

‘Anxiety-sensitivity’ and hopelessness were assessed using the Substance-use Risk Profile Scale (SURPS, Conrod & Woicik, 2002; Woicik et al., 2009). Within the present sample, baseline personality scores will be reported. Both the hopelessness and ‘anxiety-sensitivity’ subscales showed good internal reliability for short scales (Hopelessness:  $\alpha = .79$  (7 items), ‘anxiety-sensitivity’:  $\alpha = .62$  (5 items)).

#### *2.2.6.3 Bullying Victimization Questionnaire*

Adolescent victimisation from bullying was assessed using a ‘bullying questionnaire’ measure amended from questions used in the large international study entitled: Health Behaviour in School-aged Children (HBSC) study (see Currie et al., 2008), which were originally taken from the Revised Olweus Bully/Victim Scale (Olweus, 1996). Internal reliability for this sample showed good reliability at baseline, 6 and 12-months follow-up (baseline:  $\alpha = .77$ ; six months:  $\alpha = .75$ ; 12-months:  $\alpha = .76$ ).

#### *2.2.6.4 Emotional Symptoms*

Emotional symptoms were assessed using the ‘Strengths and Difficulties Questionnaire’ (SDQ, Goodman, 1997). Whilst the SDQ includes five subscales: emotional symptoms, conduct problems, hyperactivity/inattention, peer-problems and pro-social behaviour, for the purposes of the current analyses, only the emotional symptoms scale will be investigated. Internal reliability was good at all four time points (baseline:  $\alpha = .71$ ; six months:  $\alpha = .70$ ; 12-months:  $\alpha = .73$ ; 18-months:  $\alpha = .70$ ).



### *2.2.7 Intervention Workshops*

The intervention workshops were exactly the same as those included in the Preventure study (and described in the previous section). In contrast to the Preventure study, Adventure trained school teachers to facilitate each of the personality intervention groups. In total 182 intervention sessions were conducted over a 4 month period, with on average 6 adolescents per group. In order to ensure a high level of fidelity (i.e. adherence to the protocol), as well as the quality of the intervention workshops, trained members of the research team observed 41.7 percent of all sessions, with each facilitator observed running at least one intervention session. Intervention sessions were evaluated with regards to 12 core components of the Preventure Programme, which were identified by the principal investigator (Patricia Conrod) (e.g. orientation to the programme, decision-balancing exercises, etc). Of the observed sessions, 88.2 percent were rated as having ‘achieved’ or ‘partly achieved’ these 12 core treatment components, whilst 64.5 percent of observed sessions were rated as having ‘achieved’ most components (see O’Leary-Barrett et al., 2010 for more information with regards to treatment fidelity and quality).

## **2.3. THE IMAGEN PROJECT**

### *2.3.1 Overview of Study*

The IMAGEN study is an ongoing cross national European study, which is an ongoing project that started in 2007 and has recruited families to participate in the project from eight different centres (Britain: Nottingham and London; Ireland: Dublin; France: Paris; and Germany: Mannheim, Berlin and Dresden). The overall aim of the IMAGEN project is to investigate risk-taking behaviour in adolescents utilising a multi-disciplinary approach. To address this overall aim, the IMAGEN project has collected data utilising methods which include behavioural, neuropsychological, genetic, structural and functional neuroimaging. Due to the genetic component of the study, participants were recruited via high schools in geographical areas that showed minimal ethnic diversity. This recruitment strategy allowed the project to maximise ethnic homogeneity and thereby minimise any population stratification effects within the genetic data. In order to obtain a diverse sample with respect to socio-economic status as well as emotional and cognitive development, all secondary schools within chosen geographical regions were invited to participate in the project. Particular effort was

given to recruit a mixture of schools, including both private and state-funded schools, as well as pupil referral units.

### *2.3.2 Participants*

Adolescents were recruited from secondary schools across 8 study centres in England, Ireland, France and Germany to take part in this study, which forms part of a large-scale multi-centre imaging-genomics project entitled IMAGEN (Schumann et al., 2010). The full IMAGEN sample included 2000 adolescents, however, the sample for which completed datasets were available at the time of data analysis totalled 705 adolescents (mean age=14.35, SD=1.08), of which 48.2% were female and 91.8% Caucasian.

### *2.3.3 Recruitment Procedure*

Recruitment procedures were standardised across the eight study sites (apart from in Mannheim who had problems recruiting participants through schools, therefore adopted a strategy which involved the local council). Due to the cross-national complexity of the study, with 8 different study sites in 4 different countries, differences in recruitment occurred between sites. One reason for this is that each site had to obtain separate ethical approval. All sites suffered with regards to small numbers of students per school who were interested or who achieved full parental consent in order for the adolescent to take part in the study. Due to the multi-disciplinary nature of the study, full participation required 8 hours split across either 1 or 2 visits to the local institution centre. One parent of each adolescent was required to attend their local study site for approximately 2 hours. In order to provide a greater incentive for participation, all sites except for the Paris site were allowed to offer money vouchers as a thank-you for participation. This amounted to on average £20-£30 per participant. Geographical areas were selected for ethnic homogeneity (an important aspect for genetic analyses conducted with IMAGEN data, which is beyond the scope of this thesis). Due to the specific locations which were chosen for recruitment, participants and their parents often had to travel long distances in order to take part. This is exemplified in the London site which was based in South East London, however participants were recruited mainly from Kent and Surrey and therefore had to travel for approximately 60-90 minutes to attend the institution. This made recruitment more difficult and led to possibly higher rates of attrition following an initially high level of participant interest. I helped to recruit schools and students and collected data for the London site. Over a 2

year period between 2007 to 2009, London successfully recruited 24 schools and from these schools fully informed consent was received from 289 participants and their parents/ guardians (therefore an average of 12 participants were recruited per school). This low number of recruited families per school visited can be seen as a limitation to the study, potentially resulting in a more homogeneous sample. Additionally, a level of attrition occurred post-recruitment due to the demands of the study requesting both MRI scans and a blood sample. Consequently, the London site was able to scan 257 participants and collect blood samples from 255 participants. Full data were collected from 251 participants. All schools within the selected geographical areas were contacted by phone and/or letter. IMAGEN research assistants (including myself) visited schools to explain the project to teachers (science teachers, heads of year, or heads of the school), and to ask them to allow the project to recruit their students. Upon receiving school consent, the team revisited the schools to meet with students.

The IMAGEN project delivered interactive lessons on neuroscience to classes and whole school year groups. At the end of the presentation, students interested in becoming involved with the project were given information packs, and with permission of the school, students could choose to provide the team with their contact details. At this stage, students were reassured that they could opt out of the process at any stage, and that indicating an interest did not oblige them to participate. Some schools preferred an 'opt-out' procedure; parents were informed about the project prior to our visit (by a letter sent home via the students) and had the opportunity to opt out from their child participating in either the neuroscience presentation, or from giving their contact details to the team. Those students who provided their contact details were called in the evenings or weekends to answer any questions that they or their parents/guardians may have about the project. At this stage, students were not called more than twice, unless they requested otherwise. Upon receipt of their consent forms (provided from the parent/guardian and the student), participants were sent information about how to complete the home assessment and a date was arranged for the parent/guardian and child to visit their local centre.

#### *2.3.4 Exclusion Criteria*

Participants were excluded prior to taking part in the project for a number of reasons. These include: an inability for parents to accompany their children for a full assessment

day at their local research institute; participants age was restricted to 14 years (plus or minus 3 months), in order to control for difference in brain development patterns; contradiction for magnetic resonance imaging such as braces (or other metal implants), premature birth, specific illnesses such as epilepsy and diabetes, the existence of a previous brain trauma, medication and other circumstances which may have affected either function or anatomy of the central nervous system.

#### *2.3.5 Procedure*

Participants were tested both at home and at their local institute.

##### *2.3.5.1 Pilot Study*

Before commencement of the main IMAGEN project, a small pilot study was conducted to assess the reliability of internet-based home assessments, and to investigate whether responding was affected by location of testing; i.e. whether participants responded differently when they completed the questionnaires at home in comparison to completing the same questionnaires at the study centre. The pilot study was conducted in three sites: London, Berlin and Mannheim. A convenience sample of students were recruited and completed the ‘home assessment’ questionnaires and tasks both at home and at their local centre. The order for completing the home based and institute based assessments was randomised in order to control for any biases and priming effects.

##### *2.3.5.2 Home Assessment*

The internet-based home assessment was completed by the child participant in a two week period before the institute visit. If it was not possible for the participant to complete the home assessment prior to the institute assessment, they were able to complete this at their local centre. The home-assessment was conducted through a web-based coordinated system ‘Psytools’ that was developed for the purpose of multi-site, multilingual projects (Delosis, London, UK). Participants were provided with ‘home-assessment’ instructions including a unique identification code and an internet link to download the psychometric battery in a computerized format. Trained researchers were available over telephone and email to deal with any queries. The home-assessment included reliability check variables (including nonsensical responding, answering positively to sham drug questions and reaction-time checks). The home assessment also provided checks about the working environment (for example, whether it was noisy

whilst they were completing the tasks; if they were listening to music; or if someone else was watching their answers). If participants responded positively to any of these checks, they were asked in a confidential setting during the institute assessment whether this had affected their responding. As deemed necessary, participants were asked to repeat affected tasks. Any participants who provided data that were deemed to be unreliable were excluded from further analyses.

#### *2.3.5.3 The Institute Assessment*

Participants spent the equivalent of eight hours at their local institute. This assessment battery took place over either one or two visits. When the assessment was split over two visits, these days were separated by no longer than three months. The institute assessment consisted of cognitive and behavioural tasks and two magnetic resonance imaging (MRI) sessions lasting 45 minutes each (to acquire a combination of structural and functional MR scans). All images were acquired on 3-Teslar magnetic resonance scanners. In the scanner, participants were equipped with a goggle system for visual stimulation (NordicNeuroLab, Bergen, Norway) and received brief visual and verbal reminders of the task instructions before commencement of the task.

#### *2.3.6 Ethical Approval*

Ethical approval was obtained from the local ethics committee at each study centre. To assist with ethical considerations, IMAGEN set-up a multidisciplinary ethics group to monitor assessment procedures and to develop new strategies for dealing with sensitive issues related to novel findings from the contribution of genetic, biological and environmental factors in personality and psychopathology. Full parental consent and participant assent was obtained prior to project participation.

#### *2.3.7 Measures*

The following measures were administered:

##### *2.3.7.1 Demographics*

Participants were asked to provide information on gender, age and school grade during the recruitment procedure. Data on ethnicity was collected as part of a family history questionnaire completed as part of a semi-structured interview administered to the parent/ guardian by a trained researcher.

#### 2.3.7.2 *Bullying Victimisation Questionnaire*

Adolescent bullying victimisation was assessed using the same ‘bullying questionnaire’ measure that was included in both the Preventure and Adventure studies (see the Preventure measures section above for more information). This questionnaire was amended from questions used in the large international study entitled: Health Behaviour in School aged Children study (HBSC) (see Currie et al, 2008), which were originally taken from the Revised Olweus Bully/Victim Scale (Olweus, 1996). Victims were categorised as those participants who had experienced one or more of three types of bullying at least two or three times per month in the past six months. Non-victims were categorised as those participants who scored 0 for each of the three types of bullying victimisation. Internal reliability for this sample was good ( $\alpha=.71$ ).

#### 2.3.7.3 *Trauma exposure*

Participants who had experienced an extremely stressful life-event were identified during the institute assessment using the ‘Development and Well-Being Assessment’ (DAWBA, Goodman, Ford, Richards, Gatward, & Meltzer, 2000). The DAWBA is a computer based package of questionnaires, interviews, and rating techniques designed to generate ICD-10 and DSM-IV psychiatric diagnoses on 5 to 16 year olds.

To identify those participants who had experienced an extremely stressful event, participants were presented with the following statement: *The following questions are about events or situations that are exceptionally stressful, and that would really upset almost anyone. For example being caught in a burning house, being abused, being in a serious car crash or seeing family or friends being mugged at gunpoint. During your lifetime has anything like this happened to you?* Participants were asked to answer either ‘yes’ or ‘no’ to the above statement and question. Those participants who answered ‘yes’ were categorised as having experienced an extremely stressful life-event.

#### 2.3.7.4 *Emotional Symptoms*

Emotional symptoms were assessed using the ‘Strengths and Difficulties Questionnaire’ (SDQ, Goodman, 1997). Whilst the SDQ includes five subscales: emotional symptoms, conduct problems, hyperactivity/inattention, peer-problems and pro-social behaviour, for the purposes of the current analyses, only the emotional symptoms scale will be

investigated. Impact scores that assess overall distress and social impairment from emotional symptoms were assessed using a further 5 items (e.g. difficulties upset or distress me; interfere with home life; interfere with friendships; interfere with classroom learning; interfere with classroom activities). For each item participants answered on a 4-point scale (1=not at all to 4=a great deal). A total impact score was measured using a composite score of each item.

#### *2.3.7.5 Alcohol Consumption*

Alcohol consumption was assessed using a 'quantity and frequency' (QxF) of alcohol-use composite score. Drinking quantity was measured by asking participants to answer on the number of standard alcoholic beverages typically consumed on one drinking occasion over the past 30 days (according to a 5-point scale between zero and more than 10). Drinking frequency was assessed by asking students to report how often they normally drank alcohol over the same 30 day period, by using another 5-point scale (1=never to 5=daily).

#### *2.3.8 Cognitive Task*

##### *2.3.8.1 The Morphed Faces Task*

Emotional vigilance was assessed using the Morphed Faces Task. This task is an adapted version of the paradigm introduced by Pollak and Kistler (2002) using stimuli from the MacBrain database (see <http://www.macbrain.org/>). This task formed part of the participants' home-assessment and was completed using 'Psytools': a web-based computer programme.

#### Stimuli

Two characters (one male, one female) were selected from the MacBrain set (numbers: 24 and 03). The task was rendered into a virtual screen size of 1024\*768 pixels, which was automatically scaled (preserving aspect ratio) to fit the full screen on any monitor regardless of its native resolution. Four series of faces which were mixed between two emotions (anger to sad; anger to fear; happy to fear; happy to sad) were produced in the manner described by Pollak and Kistler (2002). Each continuum consisted of 11 morph-points with the emotional faces mixed at 10 percent increments (0, 10, 20, 30, 40, 50, 60, 70, 80, 90, & 100%).

### Procedure

Participants were informed that different faces would appear on the computer screen and that each face would show an emotion. Static facial images which were mixed between two emotions (e.g. anger to fear; anger to sad) were randomly presented to participants in order to disguise the specific continuum under investigation. Participants were asked to identify the facial expressions by choosing between two emotions. Participants responded by clicking on corresponding virtual response buttons, which appeared below the morphed faces, using a computer mouse. During the testing session 8 of the 11 morph points on all four continua were presented twice, for both male and female pictures. The central three morphed points, which are the points at which the two emotions are most ambiguous and therefore the most difficult to distinguish (40 percent, 50 percent and 60 percent) were presented 4 times. The number of trials totalled 224.

At the start of each trial a blue outline rectangle together with response buttons were presented on a black screen from 0 to 250ms. The facial stimuli were then presented with response button labels until the participant responded. After being presented with the instructions, participants practiced on 8 sample trials; they were then given an opportunity, if necessary, to repeat both the instructions and practice session.

### *2.3.9 Functional Neuroimaging Task*

An emotional faces task was adapted from a face task created by Grosbas and Paus (2006). Participants passively watched 18-seconds blocks of short (2-5 seconds) black and white video clips that presented five different male and female faces with animated angry or ambiguous (e.g. nose twitching) facial expressions as well as control non-biological motion stimuli (concentric circles). Five blocks for both the angry and ambiguous facial stimuli were randomly interspersed with nine blocks of animated (expanding and contracting) concentric circles. After the scanning session, participants completed a short recognition task in order to ensure that they had watched the video. For the purposes of this study, analyses will focus on the ambiguous faces versus control contrast (i.e. brain activation for ambiguous faces once the activation for the control stimulus has been removed) and the angry faces versus control contrast (i.e. brain activation for angry faces once the activation for the control stimulus has been removed). The use of these contrasts, which remove any brain activation achieved from



viewing the control stimuli, increases confidence that the subsequent analyses are examining brain activation caused from viewing the facial expressions (rather than non-specific brain activation which could be created by looking at any random object).

## **Chapter 3: BULLYING VICTIMISATION AND ALCOHOL-RELATED PROBLEM BEHAVIOUR MEDIATED BY COPING-DRINKING MOTIVES \***

### **3.1 Abstract**

**Objective:** To investigate a causal relationship between bullying victimisation and alcohol-related problems and whether the development of coping-drinking motives can help to explain this relationship.

**Method:** Participants (n=324), aged 13 to 15 years old were recruited as part of the Preventure study and were assessed during class time at 2 time points over a 12 month period. At both time points participants answered questions related to bullying victimisation, alcohol-related problem behaviour, drinking motives and the consumption of alcohol-use.

**Results:** Baseline victimisation was significantly associated with alcohol-related problem behaviour concurrently as well as 12-months later. Path analysis showed that victimisation was predictive of the development of alcohol-related problems, both directly and indirectly, through the development of coping-drinking motives.

**Conclusions:** Victimization from bullying is a risk factor for risky styles of alcohol consumption, partly due to the development of drinking behaviour reflective of an avoidant coping strategy. Victims of bullying could therefore benefit from coping skills interventions in order to reduce the risk for future alcohol-misuse.

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\* Chapter adapted from:

Topper, Castellanos-Ryan, Mackie, & Conrod. (2011). Adolescent bullying victimisation and alcohol-related problem behaviour mediated by coping-drinking motives over a 12 month period. *Addictive Behaviors*, 36, 6-13.

### **3.2 Introduction**

Recent studies have focused on a possible link between adolescent bullying victimisation and a risk for alcohol-misuse (e.g. Nansel et al., 2004; Sullivan et al., 2006; Tharp-Taylor et al., 2009). However, these studies are few in number and have so far produced inconsistent results (Topper & Conrod, in press).

Sullivan and colleagues (2006) reported a modest association between bullying victimisation and alcohol consumption levels in a sample of African-American adolescents. This result was supported more recently in a study which analysed this relationship within an ethnically diverse sample of 11 to 14 year olds. Results from this study showed that victims of either relational or physical bullying were more likely to report concurrent substance-use over a 12 month period, but no predictive relationship was shown (Tharp-Taylor et al., 2009). However, two studies published by Nansel and colleagues (Nansel et al, 2001; Nansel et al, 2004) dispute these findings. In a cross-national study which gathered data in 25 different countries, a relationship between victimisation and alcohol-use was shown, only when those victims were also engaged in bullying other adolescents (Nansel et al, 2004). The differences in the above results may be partly due to the focus upon the consumption of alcohol-use within these studies. It is possible that victimisation may not impact solely upon alcohol consumption; rather victimisation may render a young person susceptible to specific facets of drinking, instead of provoking a general vulnerability to high levels of drinking. Victims of adolescent bullying may therefore be motivated to use alcohol in a manner which reflects an avoidant coping process, in order to dampen the experience of negative affect associated with their adverse experiences, as outlined within the self-medication hypothesis (Khantzian, 1985). Measures which assess the quantity and frequency of alcohol-use may not be sensitive enough to capture this style of drinking.

Drinking motives have been described as the final common pathway towards alcohol-use and misuse (Cox & Klinger, 1988), and can help to explain why some victims of bullying may suffer from adverse consequences from their drinking in comparison to other drinkers. The risk for problematic alcohol-use can subsequently be understood by investigating, beyond the quantity of alcohol consumption, the quality of drinking which can be assessed by looking at the underlying motivations driving the drinking behaviours. Adolescents drinking alcohol due to coping motives are at greater risk for

alcohol-related problems (Kuntsche et al., 2007). Subsequently, victims of bullying who engage in alcohol-use in order to cope with their experiences may be more vulnerable for the negative consequences associated with alcohol consumption.

### *3.2.1 Aims and Hypotheses*

Whilst the literature is sparse and divided regarding the consumption of alcohol-use, to our knowledge, no study has yet examined the relationship between victimisation and alcohol-related problems. Furthermore, no study has examined the motivational mechanisms underlying this relationship in a longitudinal design. Accordingly, this chapter aimed to build on the existing literature, to investigate the association between bullying victimisation and alcohol-related problems, in addition to investigating the underlying motivational mechanisms. The hypotheses for this chapter are that: 1) school-based bullying victimisation will be associated with concurrent alcohol-related problems and predict the development of future problems; 2) the relationship between bullying victimisation and alcohol-related problems will be mediated by the development of coping motives for drinking. We investigated the relationship between school victimisation and alcohol-related problem behaviour longitudinally over a 12 month period at 2 time points.

## **3.3 Method**

### *3.3.1 Participants*

Adolescents (N=324; 71.7%=female) were recruited from 18 secondary schools across London, UK to take part in this study (mean age=13.92, sd=0.74), which forms part of a study entitled Preventure. Students attending years 9 to 11 were surveyed and followed up over a 24-month period. This chapter will report on data collected from two time points: baseline and 12-months post baseline. The follow-up rate achieved for this subsample of participants from the Preventure study was 73.5% at 12-months.

### *3.3.2. Procedure*

The same procedure was followed as described within Chapter 2 of this thesis. A short description will be included below. All students from participating year groups were initially assessed during class time. Those students who scored one standard deviation

or more above their school mean on one of the four subscales of the ‘Substance-Use Risk Personality Scale’ (Woicik et al., 2009), were classified as having ‘high personality risk’ and were invited to take part in the follow-up stage of the study. Within each school, *participants* were then randomly divided into two groups: intervention and non-intervention control. In order to control for any effects that the intervention may have had on students’ behaviour or victimisation, only non-intervention control participants were included within the current analyses.

### *3.3.3 Follow-up Assessments*

Follow-up assessments followed the same procedure as baseline. Follow-up assessments were completed by students during class time every six months for two years post baseline.

### *3.3.4 Measures*

The following measures were administered at both time-points, baseline and 12-months, using self-report questionnaires. Full descriptions of the instruments are provided in Chapter 2. A summary for each of the measures used within this chapter is included below.

#### *3.3.4.1 Demographics*

Using a forced-choice procedure participants were asked to provide information on gender, age, school grade and ethnicity (Stewart & Devine, 2000).

#### *3.3.4.2 Bullying Victimisation*

Adolescent victimisation from bullying was assessed using a ‘bullying questionnaire’ measure amended from questions used in the large international study entitled: Health Behaviour in School-aged Children (HBSC) study (see Currie et al., 2008), which were originally included within the Revised Olweus Bully/Victim Scale (Olweus, 1996). As described in detail in Chapter 2, the questionnaire consisted of three-items covering three types of victimisation (verbal, relational and physical bullying). For each item participants indicated on a five point scale (1=never, to 5=several times a week) how often they had experienced that type of victimisation within the past six months. The victimisation items were summed together to create a composite ‘frequency of victimisation’ variable.

#### *3.3.4.3 Drinking Motives*

Participants who positively responded to consuming alcohol in the past six months answered the 'Drinking Motives Questionnaire' (DMQ, Cooper, 1994). Participants who had not drunk alcohol within the past six months answered 'never' for all questions within this measure. The DMQ consists of 20 items to measure motives for drinking across 4 dimensions: enhancement, social, conformity and coping. Students were asked to report how often they drank alcohol for the different motives on a 5-point scale (1=never to 5=always). This study utilised the subscale for coping motives (e.g. to forget my worries; to cheer up when I am in a bad mood; because it helps when I am depressed or nervous).

#### *3.3.4.4 Alcohol-Related Problems*

Participants who positively responded to consuming alcohol in the past six months answered a shortened version of the Rutgers Alcohol Problem Index (RAPI, White & Labouvie, 1989). Students who had not drunk alcohol within the past six months answered 'never' for all questions within this measure. For each of the 7 items respondents indicated on a 5-point scale (1 = never, to 5 = more than 6 times) how many times they have experienced negative consequences due to their alcohol-use in the past six months (e.g. got into fights; noticed a change in my personality). Responses were summed across the 7 items to yield a composite score accounting for problem frequency and severity.

#### *3.3.4.5 Alcohol Consumption*

Alcohol consumption was assessed using a 'quantity and frequency' (QxF) of alcohol-use composite score. Drinking quantity was measured by asking participants to answer on the number of standard alcoholic beverages typically consumed on one drinking occasion over the past six months (according to a 5-point scale between zero and more than 10). Drinking frequency was assessed by asking students to report how often they normally drank alcohol over the same six month period, by using another 5-point scale (1=never to 5=daily).

### 3.4 Data Analysis

In order to derive scores for participants who were not followed up, a full information maximum likelihood estimation method (SPSS v.15) was used for continuous variables, taking into account baseline scorings. Logistic regression analyses showed that only male gender significantly predicted participant drop out at 12-months ( $\chi^2(1)=11.07$ ,  $p=0.01$ ). Scores for all measures at both time points were transformed to correct for positive skew. Victimization and QxF scores were log transformed, whilst scores from the RAPI and the DMQ were transformed by the inverse of  $x^2$  (i.e.  $1/x^2$ ) to correct for more severe positive skew. The RAPI and DMQ distributions were reversed before transformations were conducted, in order to make interpretation of results clearer, therefore high scores indicate more severe problems for all measures.

This study utilised the DMQ subscale for coping motives. Within all statistical analyses which investigated coping motives for drinking, the other three subscales of the DMQ (enhancement, conformity and social motives) were controlled for using a composite non-coping motives variable.

Firstly, Pearson correlations were conducted to assess whether victimization was related to alcohol-related problems as well as to coping-drinking motives. Partial correlations were performed in order to examine the relationship between victimization, alcohol-related problems, alcohol consumption and coping-drinking motives, controlling for the effects of the non-coping-drinking motives. Comparison analyses were conducted with the non-coping-drinking motives, controlling for the effect of coping-drinking motives.

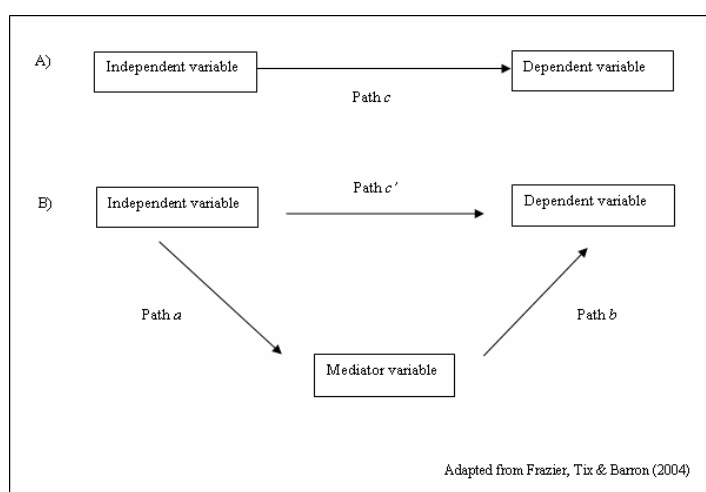
Secondly, path analyses were conducted using AMOS version 7 (Arbuckle & Wothke, 1999) to investigate a confirmatory model depicting the path from baseline victimization to alcohol-use or alcohol-related problems at 12-months. Overall goodness of fit of the model was assessed using the  $\chi^2$  test statistic, Bentler's comparative fit index (CFI, Hu & Bentler, 1998; good fit  $>.90$ ) and Browne and Cudeck's (1993) root mean square error of approximation (RMSEA, good fit  $<.08$ ).

Finally, indirect pathways which were indicated within the path analyses were formally assessed for significance using a bootstrapping mediation method. According to

Preacher and Hayes (2004; 2008) support for an indirect or mediational effect is dependent upon three criteria: (1) a significant effect of an independent variable (i.e. bullying victimisation) on the proposed mediator (i.e. coping-drinking motives); (2) a significant effect of the mediator (i.e. coping-drinking motives) on the dependent variable (i.e. alcohol-related problems); (3) the strength of the relation between the predictor variable (i.e. bullying victimisation) and the outcome variable (i.e. alcohol-related problems) should be significantly reduced when the mediator is added to the model (see Figure 3.1). The mediator is considered a “complete” mediator if the association between the independent variable and the outcome variable becomes non-significant upon the introduction of the mediator to the model. The mediator is considered a “partial mediator” if the association between the independent variable and the outcome variable remains significant, but becomes significantly smaller upon the introduction of the mediator variable to the model (Frazier, Tix, & Barron, 2004).

This method for assessing an indirect effect or mediation does not require an initial relationship to exist between the independent and outcome variables. This method to detect mediation is favoured (e.g. Preacher & Hayes, 2004; 2008; Shrout & Bolger, 2002) as it has been shown to provide the least Type I and Type II errors and is thought to have greater power to detect indirect effects than alternative ‘causal steps’ or ‘normal theory’ approaches to mediation (e.g. Baron & Kenny, 1986). Additionally, this method does not assume normality of data (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

**Figure 3.1 Diagram depicting paths in mediation models**



- A) Path  $c$  depicts the direct relationship between the independent and dependent variables; this path is not required according to the Preacher and Hayes (2004; 2008) method for assessing mediation/ indirect effects.
- B) When path  $c$  is present initially, if path  $c'$  is non-significant, complete mediation can be concluded; if path  $c'$  is still significant, but the effect is smaller, then partial mediation can be concluded.



Significance of mediation was investigated using 5000 bias corrected and accelerated bootstrapped confidence intervals, using a macro developed for SPSS by Preacher and Hayes (2004). Confidence intervals at the 95% significance levels were used to determine indirect relationships between victimisation and alcohol-related problems, with coping motives included as a potential mediator. Mediation analyses controlled for the effects of gender as well as the composite score for non-coping-drinking motives at both time points. Significant indirect effects are present when confidence intervals do not include 0. The indirect effect is subsequently significant at  $p < .05$ . All analyses conducted post baseline (i.e. at 12-months) controlled for the effect of baseline scores for the relevant variable. Analyses which investigated coping-drinking motives controlled for previous and concurrent non-coping motives.

### **3.5 Results**

#### *3.5.1 Correlation analyses*

Table 3.1 shows Pearson correlations between victimisation from bullying, alcohol-related problems, consumption of alcohol-use, and drinking motives (coping and non-coping) at both baseline and 12-months. These correlations demonstrate that baseline victimisation was significantly related to both alcohol-related problems and alcohol consumption levels at baseline and 12-months.

Baseline bullying victimisation was associated with 12 month coping-drinking motives, over and above non-coping-drinking motives. However, there was no concurrent relationship shown between victimisation and coping-drinking motives at baseline, over and above non-coping-drinking motives. Further, victimisation was not associated with non-coping-drinking motives at either baseline or 12-months<sup>1</sup>.

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<sup>1</sup> Partial correlations were also conducted between victimisation and each of the enhancement, conformity and social drinking motives (controlling for the other drinking motive subscales). The only significant correlation was found between 12 month conformity drinking motives and 12 month victimisation ( $r_p = .15$ ,  $p < .01$ ).

Baseline coping-drinking motives were related to alcohol-related problems at both time points, over and above non-coping-drinking motives. Drinking to cope was concurrently associated with alcohol-related problems at 12-months; however coping-drinking motives were not related to alcohol consumption levels at either time point. Strong concurrent relationships were shown between non-coping-drinking motives and the consumption of alcohol at both baseline and 12-months.

### *3.5.2 Path Analyses and Mediation Analyses*

Structural equation modelling investigated the path from baseline victimisation to 12 month alcohol-use, including both alcohol-related problems and alcohol consumption levels. The model utilised baseline victimisation to predict coping motives and non-coping motives at 12-months, as well as alcohol-related problems and alcohol consumption at 12-months. Baseline scores for coping, non-coping, alcohol-related problems and alcohol consumption were controlled for. All baseline measures were allowed to correlate.

The model achieved a good fit ( $\chi^2(9, N=322)=13.55$ ,  $p=.14$ ,  $CFI=.998$ ,  $RMSEA=.04$ ) (see Figure 3.2). Findings showed that both baseline victimisation and 12 month coping-drinking motives were associated with the development of alcohol-related problems after a 12 month period ( $\beta=.08$ ,  $p<.05$  and  $\beta=.30$ ,  $p<.001$ , respectively) but were not associated with 12 month alcohol consumption levels ( $p>.05$ ). Non-coping-drinking motives were concurrently associated with alcohol consumption ( $\beta=.36$ ,  $p<.001$ ), but were not associated with alcohol-related problems at 12-months ( $p>.05$ ). Consistent with hypotheses, bullying victimisation at baseline was predictive of the development of both coping-drinking motives and alcohol-related problems at 12-months.

Bootstrapping mediation analyses confirmed a significant yet small indirect effect between baseline victimisation and alcohol-related problems at 12-months, through the development of 12 month coping-drinking motives as a partial mediator. This suggests that whilst the strength of the relationship between baseline victimisation and 12 month alcohol-related problems decreased, it remained significant upon the inclusion of coping- drinking motives into the model (see Table 3.2 for the bootstrapping mediation results). Comparison analyses provided no evidence to suggest either a direct or

**Table 3.1 Correlations between bullying victimisation, alcohol outcomes and drinking motives at baseline and 12-months**

	1	2	3	4	5	6 *	7 *	8 **	9 **
Mean	5.65	9.09	9.57	4.58	5.18	6.99	7.29	22.58	23.75
(SD)	(2.82)	(4.59)	(4.33)	(5.14)	(6.05)	(4.11)	(3.72)	(11.61)	(11.03)
1. Baseline victimisation	1								
2. Baseline alcohol-related problems	.20***	1							
3. 12 month alcohol-related problems	.22***	.49***	1						
4. Baseline alcohol consumption	.11*	.64***	.49***	1					
5. 12 month alcohol consumption	.13*	.52***	.64***	.75***	1				
6. Baseline coping-drinking motives	.09	.30***	.13*	.06	.03	1			
7. 12 month coping-drinking motives	.17**	.12*	.28***	-.07	.04	.49***	1		
8. Baseline non-coping-drinking motives	.02	.33***	.21***	.58***	.41***	.79***	.48***	1	
9. 12 month non-coping-drinking motives	-.09	.17**	.27***	.41***	.49***	.46***	.80***	.59***	1

\*p<.05; \*\*p<.01; \*\*\*p<.001

NB: \* Partial correlations are reported for coping motives, controlling for non-coping-drinking motives at baseline and 12-months for analyses involving victimisation, RAPI (alcohol-related problems) and QxF (consumption of alcohol-use) variables

\*\* Partial correlations are reported for non-coping motives, controlling for coping-drinking motives at baseline and 12-months for analyses involving victimisation, RAPI and QxF variables

indirect relationship between victimisation and alcohol consumption levels. No significant relationship was shown between either baseline victimisation or 12 month coping-drinking motives and alcohol consumption levels at 12-months ( $p=.29$  and  $p=.08$ , respectively). Instead, a concurrent relationship between non-coping-drinking motives and alcohol consumption was shown at 12-months ( $\beta=.37$ ,  $p<.001$ ), whilst controlling for previous alcohol consumption and non-coping-drinking motives, as well as previous and current coping motives.

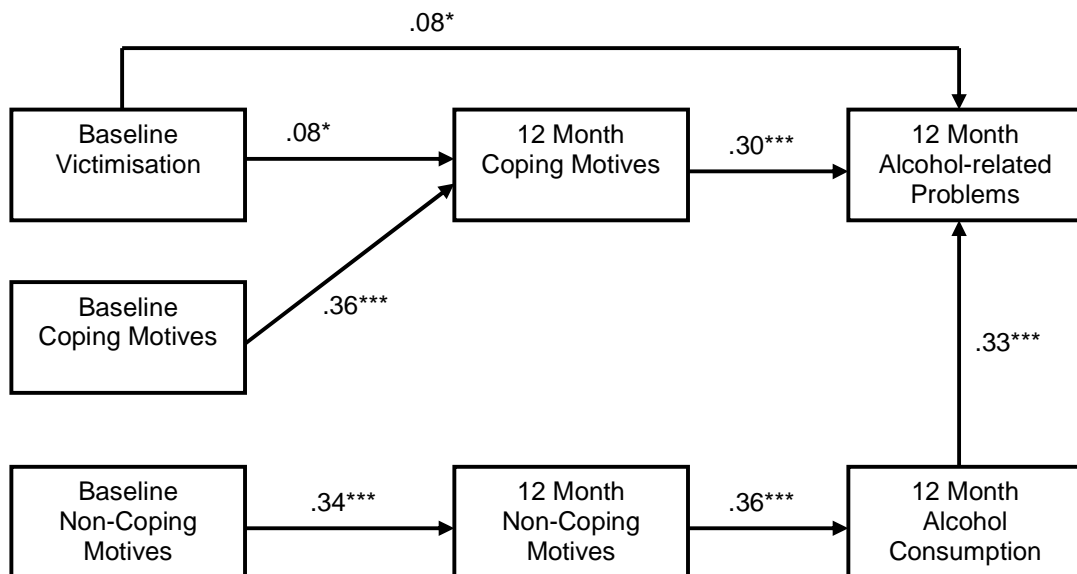
Additional mediation bootstrapping analyses were conducted to further investigate the relationship between coping motives for drinking and alcohol-related problems over a 12 month period. Results showed that 12 month coping-drinking motives partially mediated the relationship between baseline coping-drinking motives and alcohol-related problems at 12-months (95% CI=.0053 to .0255).

**Table 3.2 Mediation analysis of baseline bullying victimisation on alcohol-related problems, through coping-drinking motives**

	Adjusted $R^2$	Indirect Effect: point estimate	BCa 95% CI	
			Lower	Upper
<b>Victimisation and 12 Month Alcohol-related Problems</b>	.51			
Baseline Coping Motives		.0000	-.0006	.0001
12 Month Coping Motives		.0010	.0001	.0030

NB: 1) BCa = 5000 bias corrected and accelerated bootstrapping confidence intervals. Confidence intervals that do not include zero are considered significant. 2) The model controlled for non-coping motives at both time points as well as 12 month victimisation and baseline alcohol-related problem scores. Both models controlled for gender. 3) Adjusted  $R^2$  refers to amount of variance explained for alcohol-related problems in the final model, including both the IV and the mediator. 4) The analyses were repeated excluding 15 participants identified as being both victims and perpetrators of adolescent bullying. The exclusion of these participants did not change the direction of the above results.

**Figure 3.2 Path model from victimisation to alcohol-related problems**



Path analysis showing the path from baseline victimisation to alcohol-related problems at 12-months. The model controlled for gender as well as baseline scores for the alcohol-related outcomes, which were removed from the figure for the sake of presentation clarity. Baseline measures were allowed to covary. For the sake of presentation clarity, only significant paths are depicted. Whilst the drinking motives and alcohol outcomes were all collected at 12-months, they are presented as pathways to better depict the a-priori model, which was based on a model by Cooper and colleagues (1995).

Note: All path coefficients are standardised.

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

NB:

- 1) A comparison model was estimated using conformity and non-conformity drinking motives. This model achieved an adequate fit ( $\chi^2(8, N=324)=23.55, p < .01, \chi^2/df=2.94, CFI=.99, RMSEA=.08$ ). Unlike the coping model, victimisation was not predictive of 12-month conformity motives. 12-month conformity motives were not predictive of either consumption or alcohol-related problems at 12-months.
- 2) The model was re-estimated excluding 15 participants identified as being both victims and perpetrators of bullying. The model achieved an adequate fit ( $\chi^2(8, N=308)=13.72, p=.09, \chi^2/df=2.94, CFI=1, RMSEA=.05$ ). The pathway between baseline victimisation and 12-month alcohol-related problems became a significant trend ( $p=.08$ ) and a significant trend was seen between non-coping motives and 12-month alcohol-related problems ( $p=.06$ ).

### 3.6. Discussion

The current study uses 12 month longitudinal data to examine the impact of adolescent bullying victimisation on the development of alcohol-related problems. Furthermore, this study is the first to investigate the impact of coping motivations which are thought to underlie both the use and consequences of drinking, on the association between bullying victimisation and alcohol-related problems. Results highlight the complexity of the

relationship between school-based bullying victimisation and alcohol-misuse, showing that experiences of bullying victimisation are predictive of alcohol-related problems, and that this relationship can be partially understood by the development of coping-drinking motives. This is an understudied area of research that warrants further investigation that extends beyond the current focus on consumption levels into an understanding of the functional relationship between bullying victimisation and alcohol-misuse.

### *3.6.1 Bullying Victimisation and Problematic Alcohol-use*

The ramification of victims' engagement with alcohol has been shown to extend beyond the consumption of use into specific problem behaviours. Bullying victimisation recorded at baseline was correlated with consumption of alcohol-use over the 12 month period, which supports previous research (e.g. Sullivan et al., 2006; Tharp-Taylor et al., 2009). However, this relationship did not prove predictive when controlling for previous drinking. A stronger predictive relationship was shown between victimisation and alcohol-related problems at 12-months, over and above baseline problems. This finding suggests that whilst a measure of alcohol consumption approximates experiences with alcohol, investigating consumption levels may not be sensitive to specific facets of adolescent drinking behaviour. These include occasional excessive consumption triggered by stressful events (an adolescent drinking trajectory modelled by Colder and colleagues (2002)). Victims of school based bullying may not therefore drink high levels of alcohol frequently, yet when they do drink, they are at risk of adopting a drinking style that puts them at risk for further adverse consequences, including personality changes, or causing harm to themselves or other people.

### *3.6.2 Coping-drinking Style*

Victims of bullying have thereby been shown to adopt a risky coping-drinking strategy. Accordingly, these results suggest that victims of bullying are drinking in a similar style to that adopted by trauma victims and PTSD sufferers (e.g. Blumenthal et al., 2008). The well documented causal relationship between the experience of a severe trauma and risk for alcohol-misuse, postulates that victims drink alcohol in order to dampen the subsequent experience of negative affect, i.e. as a self medication coping strategy (e.g. Cooper et al.,

1992). This study provides initial results to suggest that victims of adolescent bullying may also be at risk for adopting a risky, self medication style of drinking.

Cooper and colleagues (1995) modelled the path from negative emotion to alcohol-use. The authors showed that in contrast to those people who drink in order to enhance social situations, those who drink alcohol in order to cope with negative emotions are at direct risk for developing alcohol-related problems. In support of this finding, the results from this chapter show that alcohol-use which is influenced by coping motives, is a style of drinking that leads directly and uniquely to alcohol-related problems. In contrast, motives for alcohol-use, other than drinking to cope, are related to an increased consumption of alcohol, and are not an immediate risk for alcohol-related problems. The specific relationship between drinking to cope and alcohol-related problems accentuates the specific risk for problematic alcohol-use presented by victimisation from bullying.

This study provides evidence in favour of a causal model of comorbidity between bullying victimisation and alcohol-misuse. Results suggest that the risk posed by victimisation can be seen even over a 12 month period, a relationship which is partly explained by a risky coping-drinking style. Victimisation appears to therefore encourage a drinking style that differs from “normal” drinking behaviour. Understanding the individual motivations that underlie alcohol-use is essential in order to prevent against adverse consequences which are associated with the riskier drinking styles that certain groups of adolescents (such as victims of bullying), may be more likely to adopt. With regards to prevention, the strong relationship between drinking to cope and alcohol-related problems suggests that victims of bullying may be deterred from engaging in drinking, if they did not associate alcohol as a potential coping strategy. In practical terms, bullying interventions should focus upon teaching victims adaptive coping techniques in order to prevent them from using alcohol in order to cope with their experiences.

### *3.6.3 Methodological Considerations*

There are a few limitations that must be taken into account when interpreting the results from this chapter. Firstly, students were surveyed at school during class. Peer

victimisation occurs mainly during school time, with perpetrators of bullying abusing their socially powerful positions (Rigby, 2002). Therefore, the survey was conducted at a location within which, victims may feel more vulnerable. To counter this, trained research assistants, as well as familiar teachers supervised data collection. However, increased anxiety may have led to victims' understating their experiences.

Secondly, the main analyses for this study did not take into account those participants who were both victims and perpetrators of bullying, due to the low prevalence of this group within the sample. A sub-analysis was conducted which excluded 14 participants categorised as being victims of bullying who also engaged in bullying their peers. Results of this analysis were in the same direction as those reported for the full sample, and did not change any of the conclusions drawn. However, this group of provocative victims have been shown to be at heightened risk for emotional and behavioural problems in comparison to either 'pure' victims or perpetrators of bullying (e.g. Nansel et al., 2001). Future studies should investigate the motivational mechanisms underlying alcohol consumption and related problems within separate groups of provocative victims and 'pure' victims, in order to understand any potential differences between these groups and to be able to tailor intervention programmes to their specific needs.

Thirdly, whilst this study controlled for the effect of gender, it did not have sufficient power to investigate gender specific effects. Gender has previously been shown to affect how victims perceive their experiences (Paquette & Underwood, 1999). Subsequently, further research with larger samples is needed to investigate potential differences in the motivational drinking pathways that may develop across female and male victims of adolescent bullying.

Fourthly, differences that may exist between different types of bullying with respect to a relationship with alcohol-misuse were not investigated. Instead this study presents results which reflect potential functional relationships between general victimisation from bullying and alcohol-misuse. Future research should consider differences between types of bullying victimisation and how these differences may affect victims' engagement with alcohol and



their risk for developing alcohol-related problems. Additionally, previous research has suggested that gender differences may exist between different types of bullying (see Smith, 1994); future research should therefore investigate potential interactions between gender and the type of bullying with respect to alcohol-misuse. Further, this thesis did not account for newer cyber-bullying forms of research. Cyber-bullying is becoming increasingly prevalent alongside technological advances, with perpetrators of bullying utilising mobile phone and social networking internet technologies to target their victims beyond the boundaries of school. This form of bullying has been associated with significant levels of emotional distress, which have been shown to be similar to those of traditional school-based victimisation (Smith et al., 2008), as well as to substance-use (Mitchell, Ybarra, & Finkelhor, 2007).

Additionally, whilst indirect effects have been shown, this study utilised two-wave data, which therefore prevents strong conclusions being drawn regarding temporality or causality. The mediational role of coping motives within the pathway between victimisation and future alcohol-related problems was of a significant yet small effect size. Consequently, this result whilst indicative of risky drinking styles for adolescent victims, does not fully explain this heightened risk. This result would need to be replicated with larger samples. Further, the data were transformed prior to analyses due to positive skew. Bootstrapping analyses were utilised to analyse the indirect effects. This methodology has been shown to be the most reliable for testing the significance of indirect effects and does not assume normality of data (Preacher & Hayes, 2004; 2008). Therefore, these results, which support the path analysis, indicate reliability of results. However, further replication is needed before strong conclusions are justified.

Finally, research on bullying is fraught with difficulties. There is no consensus over a specific definition for bullying. It has been shown that providing definitions for bullying may lead to under reporting of experiences not explicitly stated, even though students may perceive these as bullying actions (Madsen, 1996). Despite these difficulties, the results from this Chapter represent an important initial step towards understanding possible

motivational mechanisms underlying victims' alcohol usage and the risk for associated problems that increases alongside the adoption of a coping-drinking style.

#### *3.6.4 Conclusions*

In spite of the aforementioned limitations, this study has many strong points, including the longitudinal design and large sample size. This Chapter presents findings that are novel in their approach towards understanding the functional relationship between adolescent bullying victimisation and alcohol-misuse, through the investigation of alcohol-related problems and the underlying motivational mechanisms.

The results from this study provide evidence to suggest that adolescent bullying victimisation creates a proximal risk for alcohol-related problems, both directly and indirectly through the development of coping-drinking motives. In order for interventions programmes to prove successful, it is necessary to increase our understanding into the underlying causes which can lead towards alcohol problems for victims of bullying. More research is needed which differentiates between those victims of bullying who turn to alcohol in order to cope with their experiences and those who develop more adaptive coping methods, in order to be able to better prevent against this risky drinking style.

This study is an important addition to both the fields of addiction and adolescent bullying, which should help to inform school policies for both. These results indicate that the experience of bullying victimisation can have prolonged consequences with respect to alcohol-misuse, which have been shown to develop even over a 12 month period during adolescence. Consequently, even though victimisation has been shown to diminish over time (e.g. Smith et al., 1999), there is a clear need for longer term psychosocial interventions that help victims of bullying better cope with their experiences, to prevent against adverse developmental consequences. School bullying interventions in addition to their focus on preventing bullying, should address the elevated risk for victims to develop maladaptive avoidant coping strategies, such as alcohol-use.

With respect to the overarching aim of this thesis to understand the functional relationship between bullying victimisation and alcohol-misuse within adolescence, this Chapter has provided initial evidence in favour of a causal model of comorbidity; supporting the self-medication model for alcohol-use (Khantzian, 1985). The second model for comorbidity which has been proposed, and will be examined within this thesis is the common underlying mechanism model. In order to examine whether this model can apply to the relationship between bullying victimisation and alcohol-misuse, the following Chapter will investigate whether the experience of victimisation is predicted by neurotic personality characteristics and emotional difficulties; two factors that have already been shown within the literature to predict alcohol-misuse.

## **Chapter 4: THE PROSPECTIVE RELATIONSHIP BETWEEN PERSONALITY, EMOTIONAL SYMPTOMS AND FUTURE BULLYING VICTIMISATION**

### **4.1 Abstract**

**Objective:** To investigate a common-mechanism comorbidity model between victimisation and alcohol-misuse by assessing whether victimisation can be predicted by the same personality risk mechanisms (i.e. ‘hopelessness’ and ‘anxiety-sensitivity’) as have been previously identified in the literature for alcohol-misuse.

**Method:** Two independent studies (Preventure and Adventure) were used to assess and replicate the risks for victimisation over an 18-month period. Participants (Preventure: n=183 and Adventure: n=934), aged 13 to 15 years old were surveyed during class time at 4 time points over an 18-month period.

**Results:** In both the Preventure and Adventure studies, analyses showed that both ‘hopelessness’ and ‘anxiety-sensitivity’ personality domains (scored at baseline) indirectly increased risk for future victimisation at 18-months. This effect was partially explained by the development of emotional symptoms (which included physiological complaints, negative affect and anxiety-proneness). Further analyses showed that the role of personality in the relationship between victimisation and alcohol-misuse differed for ‘hopelessness’ and ‘anxiety-sensitivity’, a result which is indicative of separate comorbidity models which are dependent on personality.

**Conclusions:** These results show that two neurotic personality domains, previously implicated in the risk for alcohol-misuse, also predict victimisation. Further, the development of emotional symptoms is an important factor within the mechanisms of risk. Accordingly, personality can be seen as a common factor which increases risk for both victimisation and alcohol-misuse. The specific role for personality within this relationship has been shown to change depending on whether someone scores highly for ‘hopelessness’ or ‘anxiety-sensitivity’.

## **4.2 Introduction**

The previous Chapter provided evidence in support of a causal model of comorbidity between adolescent bullying victimisation and alcohol-misuse. The current Chapter will explore whether there is evidence for a second model of comorbidity: the common underlying mechanism model. The common mechanism model for comorbidity postulates that similar risk factors will drive the development of both outcomes: victimisation and alcohol-misuse. Accordingly, this Chapter will investigate the impact that two neurotic personality characteristics ('hopelessness' and 'anxiety-sensitivity'), in addition to emotional symptoms, have on the risk for victimisation; which are factors that have previously been implicated in the risk for alcohol-misuse (e.g. Woicik et al., 2009).

Individual factors (such as personality) have been shown to influence vulnerability for victimisation (e.g. Bollmer et al., 2006; Ball et al., 2008). Specifically, characteristics associated with the neurotic personality domain have been shown to increase interpersonal problems, including chronic victimisation (Salmivalli et al., 1996; Pepler et al., 1998; Karatzas et al., 2002; Griffiths, Wolke, Page, & Horwood, 2006).

Behavioural vulnerabilities which are associated with personality may influence an over experiencing of negative emotions (Rosen et al., 2007), which can lead to inappropriate public displays of negative emotion (e.g. crying or blushing heavily). Such displays have been associated with increases in problematic peer relationships, including the experience of peer isolation or rejection (Eisenberg et al., 2001). The experience of severe or chronic stressors can also precipitate the development of maladaptive emotional displays, thereby influencing a cyclical pattern of interpersonal conflict, emotional difficulties and the risk for future problems (Malatesta et al., 1988; Lemerise & Arsenio, 2000).

Empirical studies support this view; for example, Bollmer and colleagues (2006) investigated the relationship between personality and victimisation using self-report data from a sample of 99 children aged 10 to 13 years old. Results showed that those children who scored high for neuroticism and low for conscientiousness were more likely to experience negative affect during conflict situations; they were angrier, less forgiving and

attributed more blame to the bully. The experience of negative emotion was associated with higher levels of victimisation. Whilst this was only a cross-sectional study and therefore cannot infer causality, this result is suggestive of the functional role that neurotic personality may play in the risk for victimisation.

The study by Bollmer and colleagues (2006) supports an earlier study which investigated personality differences in 96 Italian children (aged 8 to 10 years old). Cross-sectional teacher ratings indicated that victims of bullying showed higher levels of emotional instability (which corresponded to neuroticism) and lower levels of traits such as conscientiousness and friendliness (Tani et al., 2003). The authors concluded that high levels of neuroticism augur risk for victimisation, due to an association between victimisation and difficulties in the regulation of negative emotions (e.g. Shields & Cicchetti, 2001); which increases the risk for prolonged victimisation (Schwartz et al., 2001).

#### *4.2.1 Aims and Hypotheses*

Previous studies have shown specific and independent relationships between neurotic personality characteristics, emotional experiences and alcohol-misuse (e.g. Cooper, 1995; 2000; Stewart & Devine, 2000). These same factors have been shown to confer separate risk for bullying victimisation. No previously published study has investigated these factors within a wider common-mechanism comorbidity model. This Chapter therefore has four main objectives: a) to examine predictive associations between neurotic personality domains (i.e. 'hopelessness' and anxiety-sensitivity), the development of behaviours associated with maladaptive emotional expression (e.g. displaying excessive worrying; feeling tearful), and the risk for victimisation over an 18-month period; b) to investigate the mediational role played by these emotional symptoms within the independent relationships between 'anxiety-sensitivity', 'hopelessness' and future victimisation; c) to replicate these analyses within an independent study which utilises a similar longitudinal design within a larger and more representative sample; d) to directly investigate the role of 'hopelessness' and 'anxiety-sensitivity' personality domains in the comorbidity between bullying victimisation and alcohol-misuse.

## **4.3 Method**

### ***4.3.1 Study 1: Preventure***

#### *4.3.1.1 Participants*

Adolescents (N=183; 63.4%=female) were recruited from 9 secondary schools across London, UK to take part in this study (mean baseline age=14.0, SD=0.71), which forms part of a study entitled Preventure. Whilst the full Preventure study recruited students from 24 secondary schools, baseline data on emotional symptoms were only available from the 9 schools included within the current study. Students attending years 9 to 11 were surveyed and followed up over a 24-month period. This chapter will report data collected from the first four time points: baseline, 6, 12 and 18-months. The follow-up rate achieved for this sample of participants from the Preventure study was 78.7% at six months; 69.4% at 12-months and 61.7% at 18-months (89.6% of participants were surveyed at least twice).

#### *4.3.1.2 Procedure*

The same procedure was followed as described within Chapter 2 of this thesis. A short description will be included below. All students from participating year groups were initially assessed during class time. Those students who scored one standard deviation or more above their school mean on one of the four subscales of the ‘Substance-Use Risk Personality Scale’ (SURPS, Woicik et al., 2009), were classified as having ‘high personality risk’ and were invited to take part in the follow-up stage of the study. Within each school, *participants* were then randomly divided into two groups: intervention and non-intervention control. In order to control for any effects that the intervention may have had on students’ behaviour or victimisation, only non-intervention control participants were included within the current analyses.

### ***4.3.2 Study 2: Adventure***

#### *4.3.2.1 Participants*

A replication analysis was conducted using data collected for the Adventure study, a follow-on study to Preventure. Adolescents (n=934; 52.4%=male) were recruited from 18 secondary schools across London, UK (mean baseline age=13.68, SD=.30). This study

differed somewhat from Preventure in its design. Adventure followed a cluster-randomised design, whereby *schools* were randomly selected and assigned to either a non-intervention control condition (7 schools) or an intervention condition (11 schools). Students attending years 9 to 11 were surveyed and followed up over a 24-month period. This chapter will report on data collected from the first four time points: baseline, 6, 12 and 18-months. The follow-up rate achieved for this sample of participants from the Adventure study was 84.7% at six months; 88.2% at 12-months; and 79.1% at 18-months (95.3% of participants were surveyed at least twice).

#### *4.3.2.2 Procedure*

The same procedure was followed as described within Chapter 2 of this thesis. A short description will be included below. All students from participating year groups were initially surveyed during class time. In an identical procedure to the Preventure study, all participants completed the SURPS and were categorised as being either low or high personality risk. Whilst the Preventure study followed up only the ‘high personality risk’ participants, the Adventure study followed-up all consented students regardless of their personality risk score. In order to control for any effects that the interventions may have had on students’ behaviour or victimisation, only participants from the non-intervention control schools were included within the current analyses; the included participants are either high or low personality risk. Eighty-four participants were excluded due to incomplete baseline data or unreliable answering (see Chapter 2 for more details).

The Adventure study provides an ideal basis to validate findings from the Preventure study, benefiting from a similar longitudinal design and comprising a sample recruited within the same region with a similar demography. In contrast to the Preventure study, Adventure followed up whole school year groups (regardless of their personality risk scores). This allows for a more representative sample, in order to assess whether the results from the predominantly high-risk Preventure sample can be generalised to a wider population.



#### *4.3.3 Follow-up Assessments*

Follow-up assessments followed the same procedure as baseline for both studies. Follow-up assessments were completed by students during class time every six months for two years post baseline.

#### *4.3.4 Measures*

The following measures were administered in both the Preventure and Adventure studies at all four time points: baseline, 6, 12 and 18-months. A full description of the instruments used in this thesis is provided in Chapter 2. A summary of the measures used for this chapter is included below.

##### *4.3.4.1 Demographics*

Using a forced-choice procedure (Stewart & Devine, 2000) participants were asked to provide information on gender, age, school grade and ethnicity.

##### *4.3.4.2 Personality Assessment*

‘Anxiety-sensitivity’ and ‘hopelessness’ were assessed using the Substance-use Risk Profile Scale (SURPS, Conrod & Woicik, 2002; Woicik et al., 2009). The SURPS is a 23-item questionnaire which assesses four personality risk factors for substance use: ‘hopelessness’, ‘anxiety-sensitivity’, sensation seeking, and impulsivity. Baseline scores of ‘anxiety-sensitivity’ and ‘hopelessness’ will be used for the current analyses. The ‘anxiety-sensitivity’ subscale was measured using five items (e.g. It’s frightening when I feel dizzy or faint; I get scared when I experience unusual body sensations). The ‘hopelessness’ subscale was measured using seven items (e.g. I am content or satisfied with life in general; I feel proud of my accomplishments). For each item within both subscales, participants indicated on a four point scale the extent to which they agreed with the statements about themselves (1= ‘strongly disagree’; to 4= ‘strongly agree’).

##### *4.3.4.3 Bullying Victimization*

Adolescent victimisation from bullying was assessed using a ‘bullying questionnaire’ measure amended from questions used in the large international study entitled: Health

Behaviour in School-aged Children (HBSC) study (see Currie et al., 2008), which were taken from the Revised Olweus Bully/Victim Scale (Olweus, 1996). Scores for bullying victimisation at baseline and 18-months will be utilised within these analyses.

As described in detail in Chapter 2, the questionnaire consisted of three-items covering three types of victimisation (verbal, relational and physical bullying). For each item participants indicated on a five point scale (1=never, to 5=several times a week) how often they had experienced that type of victimisation within the past six months. The victimisation items were combined to create a composite 'frequency of victimisation' variable.

#### *4.3.4.4 Emotional Symptoms*

Emotional symptoms were assessed using 5 items from the 'Strengths and Difficulties Questionnaire' (SDQ, Goodman, 1997). The items assessed physiological complaints, negative affect and anxiety-proneness (e.g. 'I get a lot of headaches, stomach-aches or sickness'; 'I am nervous in new situations'). For each item participants indicated on a three point scale how the statements reflected their behaviour over the past six months (1=not true, 2=somewhat true, 3=certainly true).

#### *4.3.4.5 Alcohol-Related Problems*

This measure will only be assessed within the Preventure sample. Participants who positively responded to consuming alcohol in the past six months answered a shortened version of the Rutgers Alcohol Problem Index (RAPI, White & Labouvie, 1989). Students who had not drunk alcohol within the past six months answered 'never' for all questions within this measure. For each of the 7 items respondents indicated on a 5-point scale (1 = never, to 5 = more than 6 times) how many times they have experienced negative consequences due to their alcohol-use in the past six months (e.g. got into fights; noticed a change in my personality). Responses were summed across the 7 items to yield a composite score accounting for problem frequency and severity.

#### **4.4 Data Analyses**

All statistical tests for this chapter were conducted using the Statistical Package for the Social Sciences (SPSS, 2004) and AMOS version 7 (Arbuckle & Wothke, 1999). Statistical significance was set at the conventional level of  $p \leq .05$ .

In order to derive scores for participants who were not able to be followed up, a full information maximum likelihood estimation (SPSS v.15) was used with continuous variables, taking into account baseline scorings for both samples. Logistic regression analyses showed that within the Preventure sample, older participants at baseline were more likely to drop out at both 6 and 12-months. No significant demographic predictors for attrition were shown for 18-months. Within the Adventure sample, older participants were more likely to drop out at 6 and 18-months. Female participants were more likely to drop out at both six months and 18-months. There were no significant demographic predictors for participant drop-out at 12-months. Victimization scores were log transformed in both data sets to correct for positive skew, thereby allowing for the use of continuous variables, and maintaining a higher level of statistical power.

Statistical analyses followed the same procedure for both the initial Preventure sample and replication Adventure sample.

Firstly, Pearson correlations were conducted to assess whether baseline ‘hopelessness’ and ‘anxiety-sensitivity’ personality scores, as well as emotional symptoms (scored at baseline, 6, 12 and 18-months) were related to victimisation (scored at baseline or 18-months).

Secondly, confirmatory path models were conducted to examine the path from ‘hopelessness’ and ‘anxiety-sensitivity’ to future bullying victimisation at 18-months. For model estimation, maximum likelihood estimators were used within AMOS version 7 (Arbuckle & Wothke, 1999). Standardised regression coefficients were computed for paths between variables. Overall goodness-of-fit was assessed using the  $\chi^2$  test statistic, Bentler’s comparative fit index: good fit  $>.95$  (CFI, Hu & Bentler, 1998) and root mean square error of approximation: good fit  $<.08$  (RMSEA, Browne & Cudeck, 1993).

Thirdly, the significance of mediation was investigated using 5000 bias corrected and accelerated bootstrapped confidence intervals, using a macro developed for SPSS by Preacher and Hayes (2004). This method to detect mediation is favoured (Shrout & Bolger, 2002; Preacher & Hayes, 2004; 2008) as it has been shown to provide the least Type I and Type II errors and is thought to have greater power to detect indirect effects than alternative ‘causal-steps’ or ‘normal theory’ approaches to mediation (MacKinnon et al., 2002). Confidence intervals were used to determine distinct indirect relationships between ‘hopelessness’ or ‘anxiety-sensitivity’ and bullying victimisation at both baseline and 18-months, with emotional symptoms at both baseline and six months assessed as a potential mediator. Indirect effects are present when the confidence intervals do not include 0. The indirect effect is subsequently significant at  $p < .05$  (see Chapter 3, section 3.4 for more information on mediation).

For consistency between the two study samples, all analyses controlled for gender and age as well as baseline scores for victimisation and emotional symptoms. The mediation models also controlled for either the ‘hopelessness’ or ‘anxiety-sensitivity’ personality domain in order to investigate independent mediation paths from either of the personality domains to future victimisation.

Final analyses assessed the role of the separate ‘hopelessness’ and ‘anxiety-sensitivity’ personality domains within a common-mechanism model of comorbidity between victimisation and alcohol-misuse. For the purposes of this final analysis, and due to the availability of data at the time of analysis, only the Preventure sample will be analysed. Analyses followed the procedure set out by Frazier and colleagues (2004). A hierarchical linear regression model was conducted to predict alcohol-misuse measured at 18-months. Step 1 included the covariates of gender and age; step 2 included the independent variable: bullying victimisation measured at baseline; step 3 included the moderator personality variables: ‘hopelessness’ and ‘anxiety-sensitivity’; step 4 included the two interaction terms between victimisation and the personality domains. As outlined by Frazier and colleagues (2004), the victimisation and personality variables were standardised to ease interpretation of the results.

## 4.5 Results

### 4.5.1 Study One: *Preventure*

#### 4.5.1.1 *Correlation analyses*

Table 4.1 shows Pearson correlations between victimisation, emotional symptoms and personality domains at baseline, 6 and 18-months. Results support the orthogonality of the two neurotic personality domains, with no significant association within this sample ( $r=.03$ ). Differences are demonstrated between personality domains regarding their relationship to victimisation. Victimisation was associated with ‘hopelessness’ at baseline and at 18-months post baseline ( $r=.38$  and  $r=.15$ , respectively) and ‘anxiety-sensitivity’ at baseline ( $r=.25$ ). Further, ‘hopelessness’ and ‘anxiety-sensitivity’ were both consistently associated with emotional symptoms at six months ( $r=.34$ ;  $r=.33$ , respectively), 12-months ( $r=.31$ ;  $r=.23$ , respectively) and 18-months ( $r=.27$ ;  $r=.29$ , respectively). Surprisingly, no significant associations were shown between either ‘hopelessness’ or ‘anxiety-sensitivity’ and baseline emotional symptoms ( $r=.02$ ;  $r=.12$ , respectively).

Victimisation at both baseline and 18-months was associated with emotional symptoms at all four time points. Initial evidence for a bi-directional longitudinal relationship was apparent, with baseline emotional symptoms related to 18-month victimisation ( $r=.17$ ), and baseline victimisation related to 18-month emotional symptoms ( $r=.25$ ).

#### 4.5.1.2 *Path Analysis*

Structural equation modelling was conducted to investigate the path from the personality domains of ‘hopelessness’ and ‘anxiety-sensitivity’ to 18-month victimisation, through the development of emotional symptoms (see Figure 4.1). The model achieved a good fit ( $\chi^2(2, 183)=1.41$ ,  $p=.50$ , CFI=1, RMSEA=.00). All baseline measures were allowed to correlate. In this model which included personality and emotional difficulties indices, the direct paths shown between either ‘hopelessness’ or ‘anxiety-sensitivity’ to 18-month victimisation were not significant. Results however indicated the presence of indirect pathways from both of these personality domains to future victimisation through the development of emotional symptoms. The development of emotional symptoms at six months was shown

to predict future victimisation at 18-months, with a concurrent association also shown between victimisation and emotional symptoms at 18-months.

**Table 4.1 Pearson correlations for the Preventure sample (n=186) between victimisation, emotional symptoms and neurotic personality domains**

	1.	2.	3.	4.	5.	6.	7.	8.
Mean (SD)	.60 (.17)	.53 (.08)	8.73 (2.42)	8.43 (2.25)	8.51 (2.38)	3.25 (2.35)	13.28 (3.92)	11.95 (3.07)
1. Baseline Victimisation	1							
2. 18-month Victimisation	.26***	1						
3. Baseline Emotional Symptoms	.16*	.17*	1					
4. 6 Month Emotional Symptoms	.36***	.36***	.28***	1				
5. 12 Month Emotional Symptoms	.27***	.18*	.12+	.46***	1			
6. 18-month Emotional Symptoms	.25**	.37***	.22**	.48***	.56***	1		
7. Baseline 'hopelessness'	.38***	.15*	.02	.34***	.31***	.27***	1	
8. Baseline 'anxiety-sensitivity'	.25**	.13	.12	.33***	.23**	.29***	.03	1

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

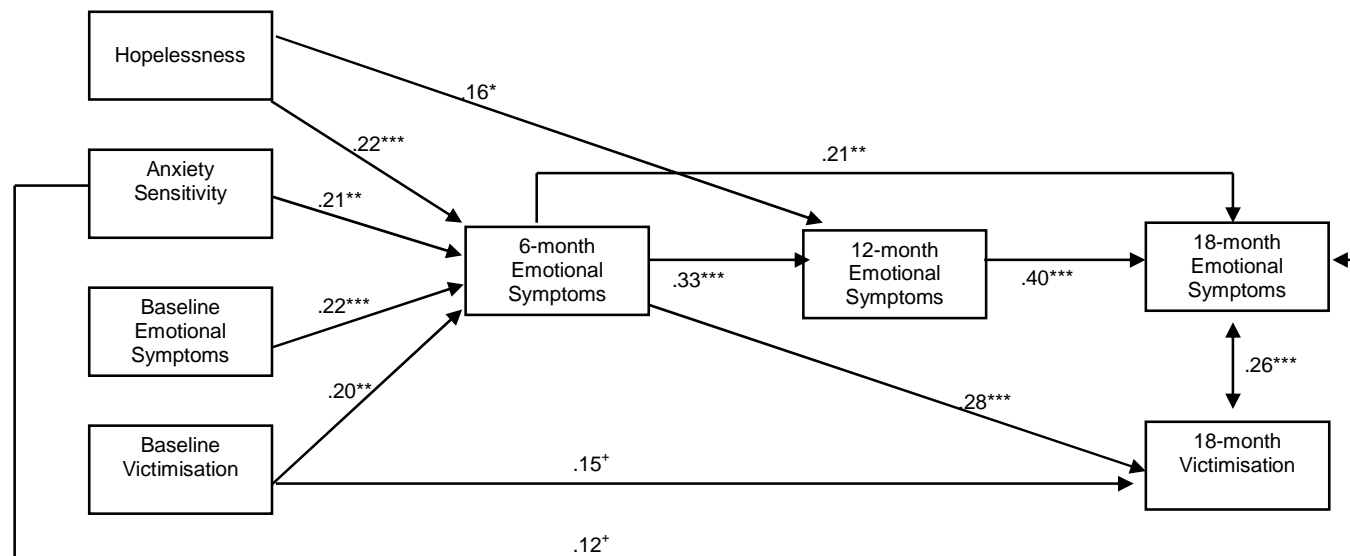
Three independent risk pathways for future victimisation are shown within the model which originate from baseline scores of 'hopelessness', 'anxiety-sensitivity' and previous victimisation. 'hopelessness' and 'anxiety-sensitivity' are shown to present independent risks for future victimisation through the development of emotional symptoms: 'hopelessness' and 'anxiety-sensitivity' scored at baseline predict the development of six-month emotional symptoms, which are strongly predictive of 18-month victimisation. Further, emotional symptoms are predictive of future emotional problems at each time point across the 18-month period, showing that the development of these symptoms increases both the risk for future problems, as well as for victimisation over an 18-month period within adolescence. The third pathway auguring towards future victimisation is shown through baseline victimisation, which also predicts the development of emotional symptoms at six months. Only a trend for a relationship between baseline and future victimisation is shown over and above both personality domains and emotional symptoms

within this model. An indirect path is apparent between baseline and future bullying victimisation through the development of emotional symptoms at six months.

#### *4.5.1.3 Mediation Analyses*

Bootstrapping analyses tested the extent to which the development of emotional symptoms could explain the relationship between ‘hopelessness’ or ‘anxiety-sensitivity’ (scored at baseline) and future victimisation (scored at 18-months). Results showed that emotional symptoms scored at six months partially mediated the independent relationships between both ‘hopelessness’ and ‘anxiety-sensitivity’ to victimisation at 18-months (see Table 4.2). Emotional symptoms scored at 18-months were shown to mediate the relationships between both ‘hopelessness’ and ‘anxiety-sensitivity’ and victimisation scored at 18-months; however unlike with six month emotional symptoms, this model did not adhere to temporal mediation assumptions. Temporal assumptions state that the independent variable should occur prior to the mediator, which should occur prior to the dependent variable. Additionally, post-hoc meditational analyses were conducted to further investigate the path from baseline victimisation to future victimisation at 18-months. The model controlled for the effect of gender, age, baseline emotional symptoms and both ‘hopelessness’ and ‘anxiety-sensitivity’ scores. Results showed that the development of emotional symptoms at six months was a significant mediator in the relationship between previous and future victimisation (95% CI: .0059 to .0756). This result indicates that over and above personality risk, baseline victimisation augurs risk for future victimisation at 18-months through the development of six month emotional symptoms.

**Figure 4.1 Preventure study: Path analysis showing risk paths for victimisation at 18-months (N=186)**



NB: The model controlled for gender. Gender as well as the non-significant pathways were removed from the figure for the sake of presentation clarity. Further, all baseline measures were allowed to covary.

All path coefficients are standardised.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; + $p = .06$



#### ***4.5.2 Replication Analyses: The Adventure Study***

##### ***4.5.2.1 Gender effects***

The larger sample provided by the Adventure study allows for investigation into the impact of gender in the risk for bullying victimisation over time. Whilst previous analyses within this thesis have controlled for any effect that gender may be having, they have not been sufficiently powered to investigate gender interactions. As such, the effect that gender may have on the proposed risk factors for victimisation was examined using multiple regression analyses in the manner outlined by Frazier and colleagues (2004). Bullying victimisation experienced at 18-months was included in the model as the dependent variable. The first step of the model included the covariates (baseline scores for victimisation and emotional symptoms). The second step included the predictor variables, which were all standardised: baseline scores for 'hopelessness' and 'anxiety-sensitivity' as well as emotional symptoms scored at 6, 12 and 18-months. The third step in the model included the moderator variable (i.e. gender). Finally, in the fourth step of the model, the five interaction terms were included (interactions between all the predictor variables and gender). Results showed no significant interactions between gender and any of the predictor variables (gender by 'hopelessness',  $p=.89$ ; gender by 'anxiety-sensitivity',  $p=.35$ ; gender by 6 month emotional symptoms,  $p=.43$ ; gender by 12 month emotional symptoms,  $p=.88$ ; gender by 18-month emotional symptoms,  $p=.93$ ). These results suggest that gender is not having a significant effect on the data within these analyses and as such the following analyses will not explore gender specific effects, but will instead include gender as a covariate.

**Table 4.2 Analysis of the indirect effects of ‘hopelessness’ and ‘anxiety-sensitivity’ personality domains on victimisation, through emotional symptoms within the Preventure sample**

	Adjusted R <sup>2</sup> for model	Indirect Effect: point estimate	SE	BCa 95% CI	
				Lower	Upper
<b>Baseline H and Baseline Victimisation</b>					
Baseline emotional symptoms	.22	.0001	.0004	-.0005	.0013
<b>Baseline AS and Baseline Victimisation</b>					
Baseline emotional symptoms	.22	.0009	.0009	-.0002	.0036
<b>Baseline H and 18-month Victimisation</b>					
6-month emotional symptoms	.11	.0013*	.0006	.0005	.0027
12-month emotional symptoms	.06	.0004	.0004	-.0002	.0018
18-month emotional symptoms	.14	.0014*	.0007	.0003	.0034
<b>Baseline AS and 18-month Victimisation</b>					
6-month emotional symptoms	.12	.0021*	.0009	.0008	.0045
12-month emotional symptoms	.06	.0004	.0004	-.0002	.0016
18-month emotional symptoms	.14	.0021*	.0008	.0009	.0042

Note: BCa = 5000 bias corrected and accelerated bootstrapping confidence intervals.

\*Confidence intervals that do not include zero are considered significant at  $p < .05$  level.

All models controlled for gender, age and baseline scores for victimisation and emotional symptoms (in predictive models). Additionally, all models controlled for the other neurotic personality domain (i.e. ‘hopelessness’ or ‘anxiety-sensitivity’).

#### 4.5.2.1 Correlation Analyses

Table 4.3 shows Pearson correlations between victimisation, emotional symptoms and personality domains at baseline, 6 and 18-months. Within this larger sample, the correlation between the two neurotic personality domains of ‘hopelessness’ and ‘anxiety-sensitivity’ is shown to reach significance ( $r = .08$ ,  $p < .05$ ). The mean values for victimisation across time (Preventure: baseline  $r = .60$ ; 18-months  $r = .53$ ; Adventure: baseline  $r = .63$ ; 18-months  $r = .58$ ) as well as for ‘hopelessness’ (Preventure:  $r = 13.28$ ; Adventure:  $r = 12.85$ ) and ‘anxiety-sensitivity’ scores (Preventure:  $r = 11.95$ ; Adventure:  $r = 11.32$ ) are similar across the Preventure and Adventure studies. The Adventure sample showed lower mean levels of emotional symptoms over the 18-month period, potentially due to the larger proportion of participants included within this sample who were

categorised as ‘low personality risk’, in comparison to the Preventure study (52.8% were categorised as ‘low personality risk’ within this sample from the Adventure study, compared to 32.8% within the sample taken from the Preventure study).

Overall, results from the correlation analyses corroborate those shown within the Preventure sample, with strong associations shown between victimisation, both the ‘hopelessness’ and ‘anxiety-sensitivity’ personality domains scored at baseline and emotional symptoms scored at all four time points. Importantly, these results support the relationship shown in the previous analyses between ‘anxiety-sensitivity’ and victimisation; a significant association is shown at baseline ( $r=.19$ ), however no significant association is shown between ‘anxiety-sensitivity’ and future victimisation at 18-months ( $r=.06$ ). Further, these results support the consistent relationship shown in Preventure between both personality domains and the development of emotional symptoms; yet this association is shown to develop earlier than the Preventure sample, with strong associations between both ‘hopelessness’ and ‘anxiety-sensitivity’ and emotional symptoms at baseline ( $r=.31$ ;  $r=.43$ , respectively).

#### *4.5.2.2 Path Analysis*

A confirmatory path analysis using the Adventure dataset was conducted to replicate pathways shown from the personality domains of ‘hopelessness’ and ‘anxiety-sensitivity’ to future victimisation at 18-months, through emotional symptoms (see Figure 4.2). The model achieved a good fit ( $\chi^2(2, 934)=6.16$ ,  $p=.05$ , CFI=.998, RMSEA=.05). All baseline measures were allowed to correlate.

The results corroborate previous findings from the Preventure sample, showing no direct pathway between either of the ‘hopelessness’ or ‘anxiety-sensitivity’ personality domains and future bullying victimisation, over and above the development of emotional symptoms and previous victimisation. Indirect pathways from the ‘hopelessness’ and ‘anxiety-sensitivity’ personality domains to future victimisation at 18-months were indicated through the development of emotional symptoms at 6, 12 and 18-months post baseline. Contrasting to the previous results from the Preventure study, a delayed predictive

relationship was shown between baseline victimisation and emotional symptoms; baseline victimisation was shown to increase the risk for the development of emotional symptoms at 12-months, rather than at six months.

Further, results showed a stronger direct pathway from baseline to 18-month victimisation, over and above the effect of the Hopelessness and Anxiety Sensitivity personality domains. A concurrent relationship was shown between emotional difficulties and 18-month victimisation, in addition to a predictive relationship shown between emotional symptoms scored at 6 and 12-months and future victimisation at 18-months.

#### *4.5.2.3 Mediation Analyses*

Mediation analyses supported the main finding from Preventure, which showed a temporal mediation over four time points within an 18-month period. The predictive independent relationships between ‘hopelessness’ and ‘anxiety-sensitivity’ to 18-month victimisation were shown to be mediated by the development of emotional symptoms at both six and 12-months (see Table 4.4). Post hoc mediation analyses were conducted which showed that in addition to a strong direct relationship, the development of emotional symptoms at 12-months acted as a partial mediator in the predictive relationship between baseline victimisation and future victimisation at 18-months (95% CI: .0025 to .0236). The indirect relationship was shown to be specific to emotional symptoms at 12-months; neither six month nor 18-month emotional symptoms were shown to mediate this relationship (95% CI: -.0042 to .0186; 95% CI: -.0129 to .0121, respectively). This is in contrast to results from the Preventure study which showed that emotional symptoms at six months mediated the relationship between past and future victimisation; reflecting the delayed relationship between victimisation and emotional symptoms shown in the Adventure sample in contrast to that seen in the Preventure sample.

**Table 4.3 Pearson correlations for the Adventure sample (n=934) between victimisation, emotional symptoms and neurotic personality domains**

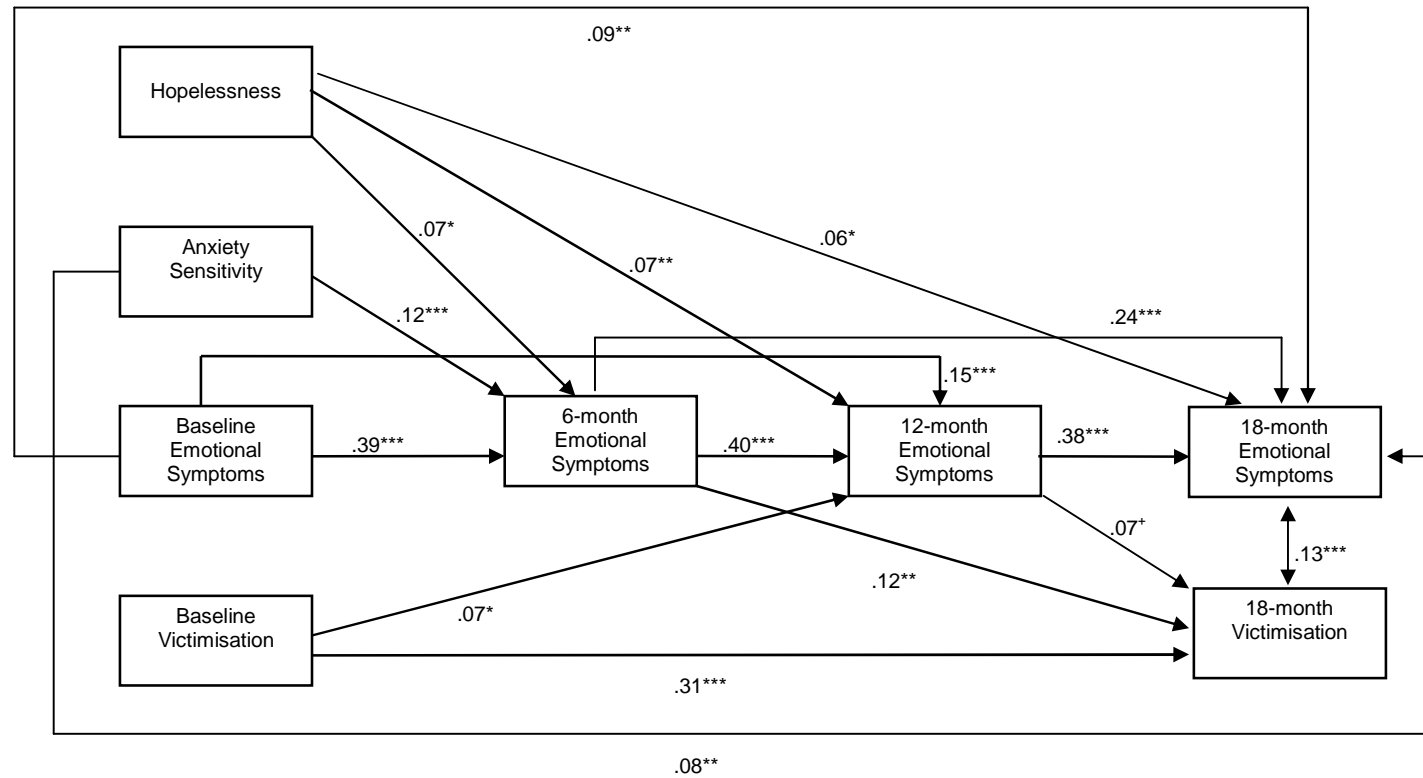
	1.	2.	3.	4.	5.	6.	7.	8.
Mean				2.59				11.32
(SD)	.63 (.15)	.58 (.14)	3.05 (2.15)	(1.98)	2.48 (2.15)	2.59 (2.09)	12.85 (3.53)	(2.65)
1. Baseline Victimisation	1							
2. 18-month Victimisation	.35***	1						
3. Baseline Emotional Symptoms	.46***	.19***	1					
4. 6 Month Emotional Symptoms	.28***	.22***	.51***	1				
5. 12 Month Emotional Symptoms	.30***	.20***	.46***	.56***	1			
6. 18-month Emotional Symptoms	.20***	.24***	.42***	.52***	.58***	1		
7. Baseline ‘hopelessness’	.28***	.14***	.31***	.22***	.23***	.22***	1	
8. Baseline ‘anxiety-sensitivity’	.19***	.06	.43***	.32***	.28***	.30***	.08*	1

\*p<0.05; \*\*\*p<0.001

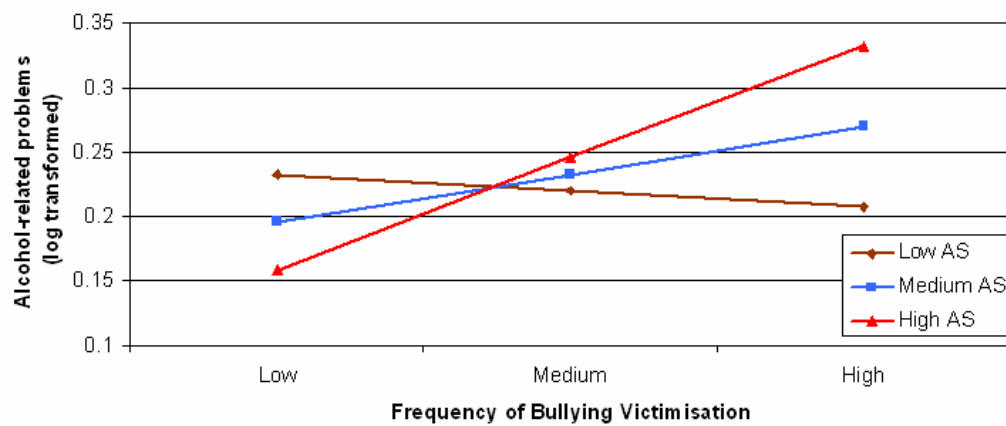
#### 4.5.3 Assessing a common mechanism comorbidity model

For the final analysis of this chapter data from the Preventure study was used. A hierarchical linear regression model was conducted in order to assess the role of the hopelessness and ‘anxiety-sensitivity’ personality domains within the functional relationship between bullying victimisation and future alcohol-misuse. Results showed that baseline victimisation predicted the development of alcohol-related problems at 18-months ( $\beta=.22$ ,  $p<.01$ ). This relationship became non-significant upon the inclusion of the neurotic personality domains into the model ( $\beta=.12$ ,  $p=.16$ , ns). The association between victimisation and alcohol-misuse was shown to be fully accounted for by ‘hopelessness’, rather than ‘anxiety-sensitivity’ (‘hopelessness’:  $\beta=.24$ ,  $p<.01$ ; ‘anxiety-sensitivity’:  $\beta=.04$ ,  $p=.59$ , ns). A significant interaction was shown between victimisation and ‘anxiety-sensitivity’ in predicting alcohol-related problems ( $\beta=.15$ ,  $p<.05$ ); victims of bullying who are highly ‘anxiety-sensitive’ are more likely to develop alcohol-related problems over an 18-month period (see Figure 4.3).

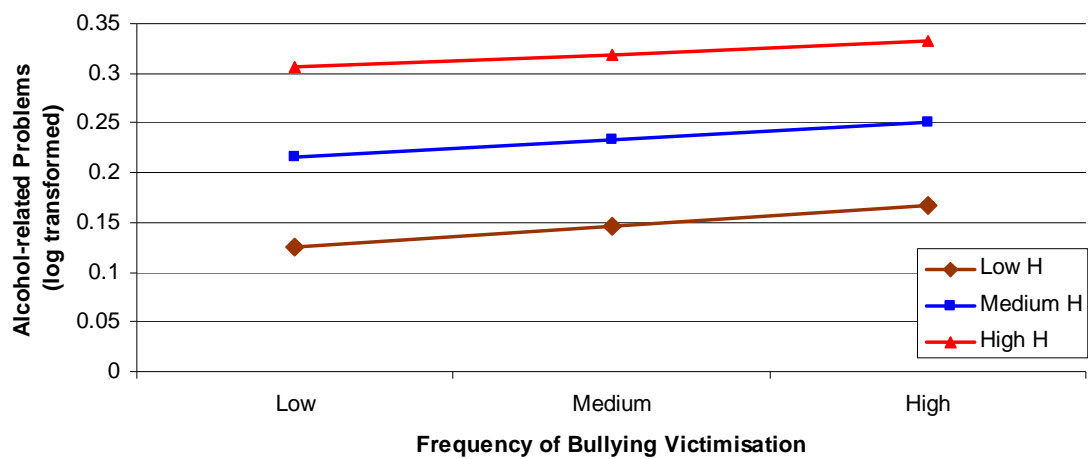
**Figure 4.2 Adventure study: Path analysis showing risk paths for victimisation at 18-months (n=934)**



NB: The model controlled for gender. Gender and non-significant pathways were removed from the figure for the sake of presentation clarity. All baseline measures were allowed to covary.  
All path coefficients are standardized regression paths.  
\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; + $p = .07$



**Figure 4.3 Interaction between bullying victimisation and ‘anxiety-sensitivity’**



**Figure 4.4 Interaction between bullying victimisation and ‘hopelessness’ (ns)**

**Table 4.4 Analysis of the indirect effects of ‘hopelessness’ and anxiety-sensitivity personality domains on victimisation, through emotional symptoms within the Adventure sample (n=934)**

	Adjusted R <sup>2</sup> for model	Indirect Effect: point estimate	SE	BCa 95% CI	
				Lower	Upper
<b>Baseline H and Baseline Victimisation</b>					
Baseline emotional symptoms	.24	.0050*	.0007	.0037	.0066
<b>Baseline AS and Baseline Victimisation</b>					
Baseline emotional symptoms	.24	.0093*	.0011	.0071	.0115
<b>Baseline H and 18-month Victimisation</b>					
6-month emotional symptoms	.14	.0004*	.0002	.0001	.0010
12-month emotional symptoms	.13	.0005*	.0002	.0002	.0010
18-month emotional symptoms	.15	.0009*	.0003	.0004	.0017
<b>Baseline AS and 18-month Victimisation</b>					
6-month emotional symptoms	.14	.0010*	.0004	.0004	.0019
12-month emotional symptoms	.13	.0007*	.0003	.0002	.0014
18-month emotional symptoms	.15	.0015*	.0004	.0008	.0024

\*p<.05

NB: 1) BCa = 5000 bias corrected and accelerated bootstrapping confidence intervals. Confidence intervals that do not include zero are considered significant. 2) All models controlled for gender, age and baseline scores for victimisation and emotional symptoms (in predictive models). Additionally, all models controlled for the non-analysed neurotic personality domain (i.e. ‘hopelessness’ or ‘anxiety-sensitivity’).

## 4.6 Discussion

This Chapter assessed a common mechanism model for comorbidity by investigating the effect of neurotic personality domains, which have previously been implicated in the risk for alcohol-misuse, in conferring risk for victimisation. Pathways of risk for victimisation were investigated and replicated using data from two independent studies with identical longitudinal designs over 18-months. The results from this Chapter provide evidence to suggest that two independent personality domains (‘hopelessness’ and ‘anxiety-sensitivity’), which are derived from the broader ‘neuroticism’ domain, indirectly increase risk for school-based victimisation over an 18-month period, partially explained by the manifestation of emotional symptoms. Further, results showed that these two personality domains differentially affect the functional relationship between victimisation and alcohol-misuse.



#### *4.6.1 The 'Anxiety-Sensitivity' and 'Hopelessness' Pathways*

Results from both the Preventure and Adventure samples have shown evidence for two independent personality risk pathways for victimisation, which are mediated through the same general mechanism. Indirect relationships were shown within both samples between baseline scores for 'hopelessness' and 'anxiety-sensitivity' and future victimisation at 18-months, through the mediation of six month emotional symptoms. These predictive relationships and mediation models demonstrate risk whilst controlling for baseline personality scores, previous victimisation and baseline emotional symptoms. Over and above these factors, it appears that emotional symptoms at six months predict additional risk for victimisation. The temporal nature of this mediational pathway over an 18-month period highlights the pivotal role played by emotional difficulties. It appears that regardless of whether these symptoms endure over 18-months, previous demonstration increases the risk for future victimisation.

#### *4.6.2 The Victimisation Pathway*

Results from both the Preventure and Adventure samples showed baseline victimisation to be a strong contributor in auguring risk for future victimisation. The Preventure study showed an indirect relationship from baseline victimisation to future victimisation at 18-months, through the development of emotional symptoms at six months. It seems that once victimisation has been experienced and emotional symptoms developed, these problems predict the continuation or development of new victimisation over the full 18-month period; a negative spiral towards repeated victimisation can therefore be seen even within an 18-month period during adolescence. Importantly, within the Preventure sample, only a trend for a direct relationship was shown between baseline and 18-month victimisation over and above the strong emotional symptoms predictor scored at six months. Previous research has shown that stability in victimisation over time can depend upon factors such as classroom environment; with low stability associated with lower social hierarchical structuring (Schafer, Korn, Brodbeck, Wolke, & Schulz, 2005). Further research has shown that victimisation decreases during adolescence (e.g. Smith et al., 1999; Nansel et al., 2001), and is therefore not wholly stable during this period. Subsequently, results from these analyses suggest that individual differences may increase risk for specific adolescents

and prevent against the general decline shown within this age group. Within this Chapter, results have shown a direct as well as indirect risk for re-victimisation using data from the larger Adventure study, whilst only an indirect risk has been demonstrated within the Preventure study. These results suggest that whilst the direct relationship between past and future victimisation over time may not be wholly stable, the development of other risk factors, such as emotional symptoms, can cause a continuation of victimisation experiences in the absence of a direct association.

The Adventure sample for the most part replicated results from the Preventure study. Both studies demonstrate temporal causation through the development of six month emotional symptoms; the Adventure study also shows emotional symptoms at 12-months to be a mediator in the development of future victimisation. The main difference between the two studies is the relationship shown between baseline victimisation and the risk for emotional symptoms. Within Preventure, the cycle of emotional problems begins immediately after experiencing victimisation at six months, whereas in the Adventure sample there is a delayed relationship, with baseline victimisation predicting the development of emotional symptoms at 12-months. This difference between the two studies may be a consequence of the lower mean levels of emotional symptoms seen in the Adventure sample, such that the victimisation experiences take longer to affect the development of these problems. Whilst victimisation and emotional symptoms are consistently correlated across the 18-month period within both samples, the path analyses demonstrate that victimisation is not continuously linked to emotional symptoms over time over and above personality risk and baseline scores.

The results of these conservative analyses (which controlled for both baseline and six-month emotional symptoms) suggest that the relationship between emotional symptoms and victimisation is unstable both over time and across the two studies. However, the main aim of this research, which was to show longitudinal risk pathways, has been supported, with the results shown to be stable and consistent in demonstrating risk across both studies.

#### *4.6.3 A common mechanism model for comorbidity*

This study in tandem with previously published studies (e.g. Woicik et al., 2009), implicates both ‘hopelessness’ and ‘anxiety-sensitivity’ as common factors in the risk for both bullying victimisation and alcohol-misuse. The results from the final analyses of this Chapter suggest that ‘hopelessness’ and ‘anxiety-sensitivity’ hold differential roles within the functional relationship between bullying victimisation and alcohol-misuse. ‘Hopelessness’ fully accounted for the predictive relationship between victimisation and alcohol-related problems, therefore representing a common factor in the risk for both outcomes and supporting a common mechanism comorbidity model. This result suggests that for adolescent victims who are high in ‘hopelessness’, their risk for alcohol-misuse is explained wholly through their personality vulnerabilities; the same personality vulnerabilities also drive their risk for victimisation. ‘Anxiety-sensitivity’ was not shown to be a common factor in the same manner as ‘hopelessness’ (it did not predict alcohol-misuse within this model). However, ‘anxiety-sensitivity’ was shown to interact with victimisation, such that victims of bullying who are highly anxiety-sensitive will be more likely to develop higher levels of alcohol-related problems. ‘Anxiety-sensitivity’ therefore seems to ‘exacerbate’ the predictive relationship between victimisation and alcohol-misuse, increasing the severity and the risk for both outcomes, without accounting for the relationship in the same manner as ‘hopelessness’.

#### *4.6.3 Limitations*

When interpreting these results it is important to take into account a number of potential limitations. Firstly, the Adventure study whilst included within this chapter as a replication study for Preventure did not utilise an identical design and therefore the samples cannot be identically matched. However, Adventure followed up all students regardless of personality-risk status and can therefore be said to be more representative than the Preventure sample. Whilst the initial results were not fully replicated, both sets of analyses strongly implicated both personality and emotional symptoms in auguring risk for victimisation.

Secondly, when interpreting the results from this study (particularly those from the larger Adventure study), the small size of some of the significant pathways should be noted. These small effect sizes warrant further investigation before firm conclusions can be drawn. Further, in the Preventure study, the lack of a relationship between baseline emotional symptoms and either 'hopelessness' or 'anxiety-sensitivity' is an aspect of the study that warrants further investigation. All three measures showed good internal reliability (see Chapter 2), and as such this lack of a relationship (shown as significant within the Adventure sample) may reflect the differences between the two samples. The sample from the Preventure study consisted of those adolescents with a high personality risk, who reported higher levels of emotional symptoms in comparison to the more varied Adventure sample (which consisted of high and low personality risk adolescents). This increased level of emotional symptoms within the Preventure sample may account for the differences shown in the relationship between emotional symptoms and personality between the two studies.

Finally, whilst results from this Chapter suggest risk pathways from across this 18-month period, it is important to note that other factors which may have been experienced in earlier childhood may also account for the development of emotional symptoms, and subsequent risk for bullying victimisation. As such, further research is needed with longer longitudinal time frames in order to ascertain risk for bullying victimisation from earlier childhood through to late adolescence.

#### *4.6.4 Clinical Implications*

The results from this Chapter highlight the importance of emotional symptoms or difficulties in conferring risk for victimisation. The development of these difficulties; which include physiological complaints, negative affect and anxiety-proneness, influence an indirect risk for victimisation in those adolescents who show higher levels of either 'hopelessness' or 'anxiety-sensitivity'. As outlined previously, the way in which individuals experience and display negative emotions partially determines their levels of social competence (Eisenberg et al., 2000). Public displays of negative emotions, as well as the behaviours associated with these emotions, could possibly be interpreted as a weakness

by peers. Due to this perception of weakness, those adolescents who show increases in emotional symptoms, may be at increased risk for either the initiation or continuation of bullying victimisation (e.g. Shields & Cicchetti, 2001; Schwartz et al., 2001). The results from these analyses further previous findings by suggesting that this risk may be heightened for those victims who report higher levels of either ‘hopelessness’ or ‘anxiety-sensitivity’. Previous studies have produced conflicting results regarding directionality in the relationship between emotional difficulties and victimisation (e.g. Juvonen et al., 2000; Bond et al., 2001; Kim et al., 2006). It cannot be said that these analyses have resolved this issue, however strong evidence has been accumulated to suggest that emotional symptoms are an important factor within the mechanisms of risk for future victimisation. Accordingly, the tendency to experience high levels of emotional symptoms as a result of neurotic personality traits or previous victimisation should be focused upon within intervention programmes that either target the personality risk (e.g. Conrod et al., 2010; O’Leary-Barrett et al., 2010) or the emotional symptoms themselves (e.g. ‘Beating the Blues’: Proudfoot et al., 2003). Well-informed, targeted prevention strategies may dramatically improve the school-life of adolescent victims and prevent against future health problems.

#### *4.6.5 Conclusions*

The first two empirical Chapters within this thesis have investigated two different models of comorbidity between bullying victimisation and alcohol-misuse within adolescence. Chapter 3 provided evidence in favour of a causal model of comorbidity, whilst the current Chapter provided evidence to suggest that there may be a common underlying mechanism involving personality and emotional difficulties, that is driving both victimisation (as shown in this study) and alcohol-misuse (as shown in previously published studies). Importantly, the results from this Chapter suggest that ‘hopelessness’ and ‘anxiety-sensitivity’ may be differentially involved in the functional relationship between victimisation and alcohol-misuse. This indicates that various risk pathways may be involved for both alcohol-misuse and victimisation from personality, which may effect the efficacy of intervention programmes which target both outcomes. The next two empirical Chapters will further explore the manner in which victims process emotional social cues

(both at a cognitive and neural level), in order to better understand how the experience of bullying victimisation may impact on victims' behaviour within social situations. Changes to victims responses to emotional cues may work to differentiate them from their uninvolved peers and thereby increase risk both for prolonged victimisation, as well as adverse behavioural consequences.

## **Chapter 5: HYPERVIGILANCE FOR EMOTIONAL FACES IN VICTIMS OF BULLYING AND TRAUMA-EXPOSED ADOLESCENTS: COGNITIVE ANALYSES**

### **5.1 Abstract**

**Objective:** This study sought to further previous literature by assessing differences in the vigilance for negative emotional faces between adolescent victims of bullying, individuals who have been exposed to a severe trauma and uninvolved ‘control’ participants.

**Method:** Participants (n=247, mean age=14.41; 41 victims of bullying; 48 who had been exposed to a severe trauma and 158 control participants) were recruited from schools across 8 different studies sites in Europe, as part of the IMAGEN project. Participants were assessed across 1 or 2 sessions at both their home, using a computer-based programme and at their local research centre.

**Results:** Adolescents exposed to bullying victimisation or a severe trauma showed similar levels of hypervigilance to fear under the context of anger. Trauma-exposed adolescents displayed significantly greater levels of hypervigilance to fear in comparison to controls. A significant trend suggested that victims of bullying also showed increased vigilance for fear, under the context of anger, in comparison to control participants. A linear association was shown between groups with regards to fear vigilance, with trauma-exposed adolescents displaying the greatest level of vigilance, and control participants showing the lowest.

**Conclusions:** These results suggest that experiencing bullying victimisation or exposure to trauma results in comparable heightened levels of vigilance for social threat. The comparability of these groups tentatively suggests this hypervigilance for fear may be a consequence of victims’ adverse social experiences.

## **5.2 Introduction**

The previous Chapter provided evidence to suggest that emotional difficulties are important in auguring risk for future victimisation. The current Chapter will further investigate the emotional impact of victimisation, by assessing whether victims of bullying show differential cognitive response patterns to emotional social cues in comparison to their uninvolved peers as well as to those adolescents who have been exposed to a life-time trauma. With respect to the overall aim of this thesis, the current analyses will provide further information regarding a potential causal model of comorbidity between victimisation and alcohol-misuse. This model postulates that victims of bullying will increase their use of alcohol in an attempt to dampen symptoms of hyperarousal. If victims of bullying and those adolescents who have been exposed to a trauma, display similar reactions to social stimuli, this may suggest that any signs of hypervigilance are a consequence of the victims' adverse experiences. This would support the notion of a causation model for alcohol-use (e.g. the self medication model for alcohol-use: Khantzian, 1985): those victims of bullying who drink alcohol may do so to compensate for a hypervigilance towards socially threatening cues in their environment.

Prolonged exposure to traumatic or stressful events has been shown to negatively effect cognitive functioning (see DeBellis, 2001). Impaired cognitive functioning can impact the manner in which individuals experience emotions and respond to emotional cues, thereby leading to a hypervigilance for threat in the external environment (Malatesta & Wilson, 1988; Lemerise & Arsenio, 2000). Facial paradigm tasks (e.g. Ohman, Lundqvist, & Esteves, 2001; Mogg, Garner, & Bradley, 2007) are suitable for assessing the cognitive and emotional effects of trauma, as they provide an ecologically valid representation of emotion within social interactions (Ekman, 1993; Kanwisher et al., 1997; Palermo, & Rhodes, 2007).

The ability to categorise emotions within facial expressions is dependent upon both experience and learned expectations (Pollak & Sinha, 2002). In real world settings, adolescent victims of trauma and bullying will often be presented with varying or novel social situations that require interpretation amidst differing contextual information (e.g.



their own current emotional state, or previous social experiences). Only one identified study has assessed victims' recognition of emotional faces. Two-hundred children aged 9 to 11 years old took part in a facial expression recognition task. Results showed no significant differences in emotional recognition between victims of physical bullying and non-victims. Victims of either relational bullying (i.e. social exclusion; rumour mongering) or a combination of relational and physical bullying exhibited poorer emotional recognition abilities, particularly for angry and fearful faces. However, only small effect sizes were shown and the sample size for relational victims ( $n=11$ ) was perhaps too small for any firm conclusions to be drawn. Furthermore, this study utilised a pre-adolescent sample and did not examine the effect of contextual information on victims' responding (Woods et al., 2009).

The morphed faces task allows for an assessment of emotional vigilance, whilst taking into account the context under which the cues are presented. 'Target' facial emotions are displayed amidst different distracter (or 'prime') emotions; i.e. two emotions are mixed together, and participants are required to distinguish between the emotions. Pollak and Kistler (2002) examined emotional recognition in a sample of 40 children with a history of abuse, using a morphed faces task consisting of four dimensions (happy and sad; happy and fear; anger and sad; anger and fear). Abused children were shown to over-identify anger, which contrasted to the under-identification shown by control children. Further, the effect of experiencing abuse on emotion hypervigilance was shown to be anger specific, with no between group differences shown for the other emotions.

### *5.2.1 Aims and Hypotheses*

The previous Chapter of this thesis suggested that emotional symptoms are implicated both as a consequence of bullying, as well as affecting risk for a continuation of victimisation. Such symptoms included displaying sadness (e.g. crying), and anxiety (e.g. worrying a lot). The current study will therefore aim to further the work of Pollak and Kistler (2002) who showed hypervigilance for anger in maltreated children, by investigating whether victims of bullying also display a hypervigilance for negative emotions (i.e. fear and sadness). Novel to these analyses, this study will compare victims' emotional vigilance to two groups of

adolescents who have either experienced a lifetime trauma (that is not school-based victimisation) or who are considered ‘uninvolved’ controls (i.e. those participants who have experienced neither bullying victimisation nor a severe life trauma). Victims’ emotional vigilance for two ‘target’ emotions (fear and sadness) will be investigated under the context of a threatening prime emotion (i.e. anger). Using the morphed faces task, this thesis will utilise anger and happiness as the ‘contextual’ emotions, whilst investigating victims’ responses to fear and sadness as the ‘target’ emotions. The task has been conceptually perceived in this way due to the particular aims of this thesis to investigate the effect of school-based victimisation on victims’ emotional responses with regards to anxiety-sensitivity and hopelessness. Should victims show an increased reaction to fear and sadness, this would provide support for the previous results within this thesis which have shown that those adolescents who relate highly to ‘anxiety-sensitivity’ and ‘hopelessness’ are more vulnerable to victimisation from their peers. Similarly to previous studies which have shown that trauma-exposed individuals display a hypervigilance for threat (Lavy & Vandenhout, 1993; Ehlers & Breuer, 1995; Daleiden, 1998; Pollak & Kistler, 2002), it is hypothesised that victims of bullying will show a bias towards negative emotional stimuli (fearful and sad faces) under the context of threat (i.e. angry faces). This hypervigilance for negative emotions will be similar to trauma-exposed adolescents, but will differ from uninvolved control participants.

## **5.3 Method**

### *5.3.1 Participants*

Adolescents (n=247; 48.2%=female; mean age=14.41, sd=0.33) were recruited from secondary schools across 8 study centres in England, Ireland, France and Germany to take part in this study, which forms part of a large-scale multi-centre imaging-genomics project entitled IMAGEN (see Schumann et al., 2010). The final sample included only participants for whom phenotypic quality control procedures had been completed for all relevant measures at the time of writing.

### *5.3.2 Testing Setting*

Participants were tested both at home and at their local institute over 1 or 2 visits. The home-assessment was conducted through a web-based coordinated system ‘Psytools’ that was developed for the purpose of multi-site, multilingual projects (Delosis, London, UK). Participants were provided with ‘home-assessment’ instructions including a unique identification code and an internet link to download the psychometric battery in a computerized format. The home-assessment included reliability check variables (including nonsensical responding, answering positively to sham drug questions and reaction-time checks). Participants who failed these reliability checks were excluded from the current analyses.

### *5.3.3 Measures*

A full description of the instruments used in this thesis is provided in Chapter 2. A summary of the measures used for this chapter is included below.

#### *5.3.3.1 Demographics*

Participants were asked to provide information on gender and age. Information regarding ethnicity was collected as part of a semi-structured interview regarding ‘family-history’ administered to the parent or guardian by a trained researcher.

#### *5.3.3.2 The Morphed Faces Task*

Emotional vigilance was assessed using the Morphed Faces Task. This task is an adapted version of the paradigm introduced by Pollak and Kistler (2002) using stimuli from the MacBrain database (see <http://www.macbrain.org/>). Two characters (one male, one female) were selected. Four series of faces which were mixed between two emotions (anger to sad; anger to fear; happy to fear; happy to sad) were produced in the manner described by Pollak and Kistler (2002). Each continuum consisted of 11 morph-points with the emotional faces mixed at 10 percent increments (0, 10, 20, 30, 40, 50, 60, 70, 80, 90, & 100%) (see Figure 5.1).

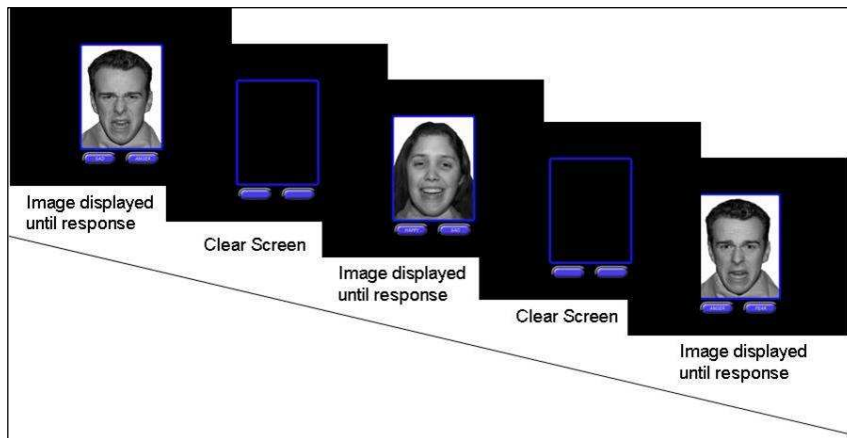
Participants were informed that different faces would appear on the computer screen and that each face would show an emotion. Static facial images which were mixed between two emotions (e.g. anger to fear; anger to sad) were randomly presented to participants in order to disguise the specific continuum under investigation



**Figure 5.1 Photographs of included faces morphed between 2 emotions**

NB: The photographs on the left represent faces which are comprised 100% of the ‘prime-emotion’ (i.e. angry or happy), whereas the photos on the right represent faces which are comprised of 100% of the ‘target-emotion’ (i.e. fear or sad)

Participants were asked to identify the facial expressions by choosing between two emotions. Participants responded by clicking on corresponding virtual response buttons, which appeared below the morphed faces, using a computer mouse (see Figure 5.2 below). During the testing session 8 of the 11 morph points on all four continua were presented twice, for both male and female pictures. The central three morphed points, which are the points at which the two emotions are most ambiguous and therefore the most difficult to distinguish (40 percent, 50 percent and 60 percent) were presented 4 times. The number of trials totalled 224.



**Figure 5.2 Procedure of the morphed faces task**

#### *5.3.3.3 Bullying Victimization*

The same ‘bullying questionnaire’ measure which was used in the Preventure and Adventure studies was utilised for this study. This measure was amended from questions used in the large international study entitled: Health Behaviour in School-aged Children (HBSC) study (see Currie et al., 2008), which were taken from the Revised Olweus Bully/Victim Scale (Olweus, 1996).

As described in detail in Chapter 2, the questionnaire consisted of three-items which detailed three types of victimisation (verbal, relational and physical bullying). More severe victims were identified as those who had experienced one or more type of bullying at least two or three times per month in the past six months. Within the current study, these participants will be classified as ‘victims’.

#### *5.3.3.4 Trauma Exposure*

Participants who had experienced an extremely stressful life-event were identified during the institute assessment using the ‘Development and Well-Being Assessment’ (DAWBA, Goodman et al., 2000). Participants were presented with the following statement; a screening question which is used to diagnose Post Traumatic Stress Disorder: *The following questions are about events or situations that are exceptionally stressful, and that would*

*really upset almost anyone. For example being caught in a burning house, being abused, being in a serious car crash or seeing family or friends being mugged at gunpoint. During your lifetime has anything like this happened to you?* Participants were asked to answer either ‘yes’ or ‘no’ to the above statement and question. Those participants who answered ‘yes’ were categorised as having experienced an extremely stressful life-event.

#### **5.4 Data Analyses**

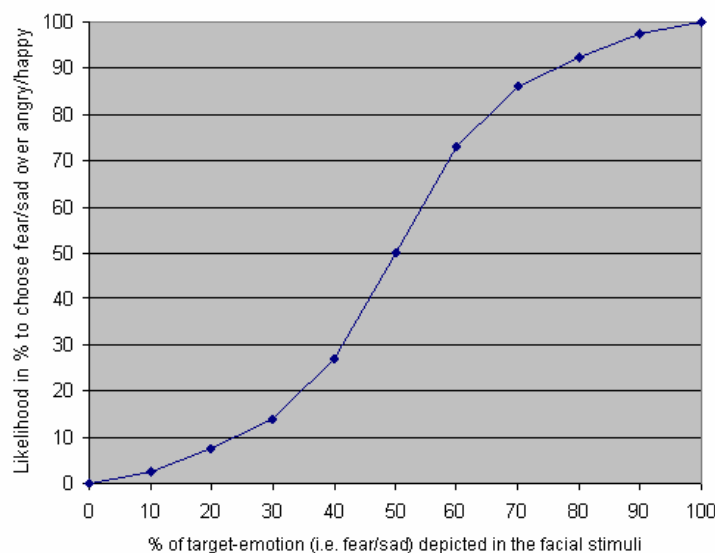
A categorical grouping variable was created which identified 3 groups of participants who had either: a) experienced victimisation from bullying at least 2-3 times per month over the past six months (n=48); b) been exposed to a lifetime trauma (n=41); or c) experienced neither event (n=158). In order to be able to differentiate between the effects of bullying victimisation and exposure to trauma, fourteen participants were excluded from further analyses due to experiencing both victimisation and trauma exposure.

Emotional vigilance for each morph point within each continuum on the faces task was recorded. Emotional vigilance was scored as the likelihood in percentage to choose the target-emotion (fear or sad) over the prime-emotion (angry or happy) at each morph point within the different continua. Analyses focused on the differential ability between groups to identify the target-emotion (fear or sad) under the context of the different ‘prime-emotions’ (anger or happiness): i.e. within a positive-emotional or negative-emotional context. Higher scores indicated a greater likelihood to recognise the target emotion (either fear or sadness) (see Figure 5.3 below). Analyses for this study were primarily concerned with participants’ vigilance for negative emotions under a threatening context (i.e. anger). Subsequently, the two anger related continua (anger to fear; anger to sad) are the main focus of these analyses, with the happy related continua (happy to fear; happy to sad) were included in the analyses as comparison continua, in order to be able to determine whether any effects are specific to the anger domain.

The IMAGEN study was conducted across eight European study sites. The impact of clustering by site upon the data was assessed using the ‘variance components’ methodology

within SPSS. Controlling for the effect of site is not deemed to be necessary if unconditional models reveal that less than 10% of systematic variance exists at the between site level (Lee, 2000). Analyses revealed that between 0 and 5 percent of the variance in emotional vigilance was accounted for by intra-cluster correlations. As such, the data for all further analyses were collapsed across the different sites.

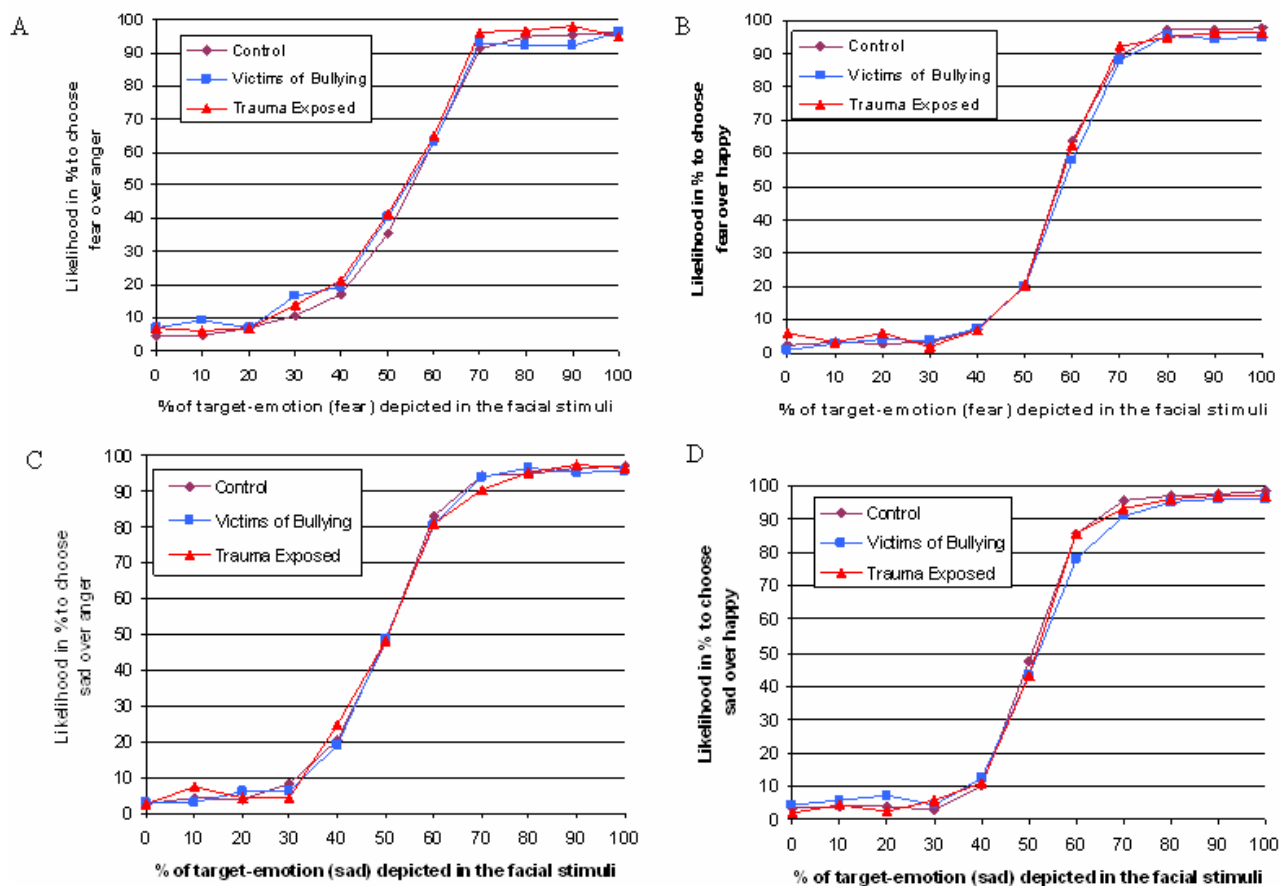
Differences between groups on emotional vigilance were analysed using repeated measures analyses of covariance (ANCOVA), using the victimisation-trauma (VT) grouping variable as the between-subjects factor and the target emotion (fear or sad), prime emotion (anger or happy) and morph point as within subjects factors. All analyses covaried for the effects of gender and emotional symptoms. Emotional symptoms were controlled for within these analyses as they were shown within Chapter 4 to be important in increasing the risk for future victimisation. The current Chapter is attempting to assess the effect of victimisation on cognitive emotional vigilance, over and above any emotional behavioural difficulties that they may be experiencing. Significant interactions were investigated further by holding the prime emotion constant.



**Figure 5.3 Theoretical curve showing emotional vigilance for the target emotion that would typically be expected along a continuum which is morphed between 2 emotions (where ‘0%’ represents a face that consists 100% of the prime emotion and 0% of the target emotion)**

## 5.5 Results

Table 1 shows the means and standard deviations of the emotional vigilance scores for each group across the 11 morph points on all four continua. These mean scores were plotted at each morph-point (see Figure 5.4). The plots below show that the vigilance slope for the control group in each of the four continua appears most similar to the hypothetical response depicted previously in Figure 5.3. The three groups appear to be the most different in response to fearful faces under the context of an angry prime emotion.



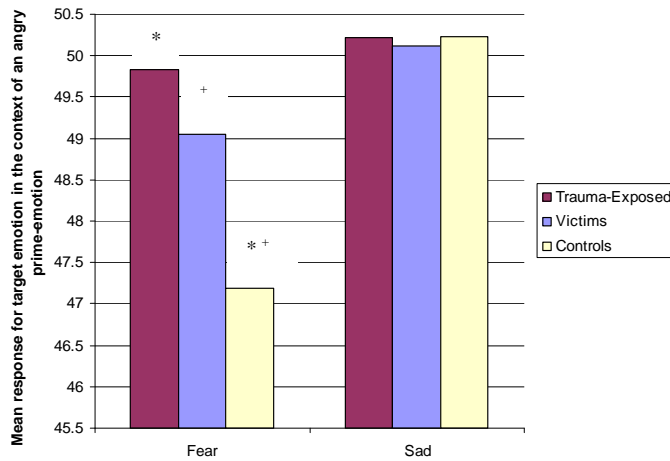
**Figure 5.4 Descriptive plots of the mean emotional responsivity for each of the 3 groups, at each morph point, across all four continua**

Plot A displays participants responsivity to fearful faces in the context of anger; plot B displays participants responsivity to fearful faces in the context of happiness; plot C displays participants responsivity to sad faces in the context of anger; plot D displays participants responsivity to sad faces in the context of happiness.



Inferential analyses of the between groups differences in mean vigilance scores across each of the four continua were conducted using repeated measures ANCOVA. The grouping variable was included as the between-subjects factor, and target emotion (fear/ sad), prime emotion (happy/ angry), and morph point were included as the within-subjects factors. At this stage of the analyses, the 2 happiness-related continua were included as a comparison to the anger continua; which are the 2 continua under investigation. No significant between-group main effects were found when investigating scores across all four continua. Significant effects were found for target emotion,  $F(1,242)=14.62$ ,  $p<.001$ ; prime emotion,  $F(1,242)=25.73$ ,  $p<.001$ ; and morph point,  $F(10,2420)=525.16$ ,  $p<.001$ . A significant linear four-way interaction was found for target-emotion by prime-emotion by morph-point by group,  $F(2,242)=3.42$ ,  $p<.05$ . Due to the difficulties in interpreting a 4-way interaction, as well as the focus of this study on vigilance to threat, the following analyses will hold prime emotion constant and investigate between group differences using only the two anger-related continua (anger to fear; anger to sad).

Repeated measures analyses of covariance, which included both of the anger-related continua within the same model showed a significant two-way interaction for target-emotion by group  $F(2,242)=3.28$ ,  $p<.05$ , as well as a trend for a multivariate three-way interaction between target-emotion, morph-point and group,  $F(20,468)=1.51$ ,  $p=.07$ . This result suggested that group differences were apparent specifically for fearful faces in the context of anger; victims of bullying and trauma-exposed participants display higher levels of vigilance for fear. This was investigated further in analyses that included only the anger-fear continuum; results showed a significant between-groups difference  $F(2,242)=4.07$ ,  $p<.05$ . Pairwise comparisons showed that participants who had been exposed to a trauma were significantly more likely to recognise a face as fearful when the emotion was mixed with anger, in comparison to control participants ( $p<.05$ ). A trend suggested that victims of bullying were also more likely to identify fear in comparison to control participants ( $p=.07$ ). No significant difference was shown between those trauma-exposed participants and victims of bullying ( $p=.54$ ) (see Figure 5.5).



**Figure 5.5 Mean emotional vigilance (in percentages) for fear and sadness in the context of anger**

\* $p < .05$ ; + $p = .07$

The above results suggest that vigilance for fear increased in a linear fashion across groups; i.e. control participants were less vigilant for fear than victims of bullying, who in turn were less vigilant than trauma-exposed adolescents. A post-hoc ANOVA analysis was therefore conducted to assess the significance of this linear association using a mean vigilance score that was computed from all scores across the anger-fear dimension. Results showed a significant linear association between groups ( $p < .05$ ). Effect sizes for fear vigilance between groups were calculated, showing a small effect size for victims' vigilance for fear in comparison to controls (Cohen's  $d = .20$ ), and a moderate effect size for trauma-exposed participants' fear vigilance in comparison to controls (Cohen's  $d = .30$ ).

No significant interactions or mean differences were seen between groups within the anger-sad continuum (main effect of group:  $p = .99$ ). Further, comparison analyses of vigilance to fearful and sad faces under the context of happiness showed no significant between group differences (main effect of group:  $p = .46$ ).

## **5.6 Discussion**

This Chapter aimed to understand the impact of adolescent victimisation for emotional vigilance under the context of social threat. The design of this study was developed in order to investigate whether victims over-detect negative emotions in comparison to adolescents who have experienced a severe life trauma as well as to a group of uninvolved ‘control’ participants. Accordingly, these analyses sought to evaluate the impact of victimisation on response to social facial cues under a threatening context, as well as to assess whether this impact is comparable to adolescents who have been exposed to a life-time trauma. This is the first study to investigate victims’ emotional hypervigilance and to assess whether this hypervigilance is specific to a threatening social context. Using a morphed faces design, this study distinguished between participants’ responses to sadness (a non-threatening negative emotion) and fear (a threatening negative emotion) under a threatening emotional context (i.e. when the emotions were mixed with anger).

The results showed significant group differences, with both trauma-exposed participants and victims of bullying over detecting fear in comparison to an uninvolved ‘control’ group of participants. This apparent hypervigilance for fear was only shown when the fear was mixed with anger; utilised to represent social threat. Interestingly, no significant differences between groups were shown for sadness mixed with anger. Further, comparison analyses showed this effect to be anger-specific, with no hypervigilance for fear shown when presented under a positive context (i.e. when morphed with happiness). Interestingly, whilst the trauma-exposed participants did not significantly differ from victims of bullying (who have been bullied at least two or three times per month in the past six months), evidence for a linear trend was found. This showed that victims of bullying displayed a greater hypervigilance for fear in comparison to their uninvolved peers (who had experienced neither victimisation nor a trauma), which was less severe than those adolescents exposed to a severe trauma.

These results are in accordance to the study by Pollak and Kistler (2002), which used the same task to show that maltreated children display an anger-specific detection bias. The current study has shown similar results in two further vulnerable groups. Taken together,

these results suggest that a heightened attention to fearful facial cues is primed or facilitated by an anger cue. It seems that anger in parallel with fear produces an extra threatening stimulus that is strong enough to elicit a hypervigilance for threat in these vulnerable groups. In contrast, fear under a happy context may not be perceived as threatening to the same extent, which would help to explain the lack of an emotional bias to fear under the context of a happy prime emotion.

The finding of a fear hypervigilance supports previous research which has previously shown hypervigilance in trauma-exposed and anxious individuals towards negative or threatening stimuli (see Lavy & Vandenhout, 1993; Ehlers & Breuer, 1995; Daleiden, 1998). Importantly, this study expands on previous findings by showing that victims of bullying also demonstrate a hypervigilance for fear. This increased cognitive response to fear under a context of social threat may predispose towards, or exacerbate the effects of interpersonal problems (see Visu-Petra, Tincas, Cheie, & Benga, 2010), thereby leaving victims vulnerable for a continuation or increase in the severity of their experiences.

#### *5.6.1 Limitations*

Whilst this study reports important and novel findings, there are a few limitations that must be taken into consideration when interpreting these results. Firstly, the morphed faces task included four continua: anger to fear, anger to sad, happy to fear and happy to sad. The results from this study would have benefited from two further continua: anger to neutral and happy to neutral in order to distinguish whether this result was fear specific or instead due to the anger context.

Secondly, this study followed a cross-sectional design and thereby no implications for causality can be drawn; longitudinal research is needed in order to assess emotional vigilance over time. Whilst this is a limitation, results from this chapter provide an important initial foray into the association between victimisation and emotional processing, as well as providing evidence to suggest that adolescent victims exhibit similar levels of emotional vigilance to those who have been exposed to trauma.

Thirdly, adolescents exposed to a severe trauma were identified by using a screening question for Post Traumatic Stress Disorder (PTSD). This question asked participants to recall any traumatic event that may have occurred within their lifetime. This wide time frame was perceived as necessary due to the rare occurrence of such events, however, this may have inadvertently caused recall errors. This timeframe is also in contrast to the measure for bullying victimisation, which asked about victimisation experiences from the past six months. Due to only a few participants reaching the full diagnostic criteria for PTSD within the IMAGEN sample, it was not possible to use participants diagnosed with PTSD as a comparison group. Future research should extend this research by assessing whether victims of bullying show similar cognitive responses to those adolescents who have been exposed to a severe trauma and who meet the criteria for PTSD.

Finally, due to the genetic nature of the wider IMAGEN project, an ethnically homogeneous sample was recruited. The results of this study are therefore limited for a predominantly Caucasian sample. Future studies should replicate this design within a more representative sample, in order to assess whether the current results can be generalised across ethnicities.

### *5.6.2 Conclusions*

The strengths of this study include the three-group design and the use of large cross-national sample; which allow these results to be generalised across nationalities and cultures. Further, the morphed faces design analysed advances efforts made by other studies, by allowing an examination of emotional vigilance whilst differentiating between positive and negative contexts, which have shown these effects to be specific to a socially threatening context. The results from this study have indirect implications regarding the severity of victimisation as a stressful life experience. Victimisation from bullying has been shown to be associated with a cognitive hypervigilance for threat, which is similar to the levels of hypervigilance shown by those adolescents who have experienced a severe trauma. This similarity between the different ‘victim’ groups suggests that a hypervigilance for fear under the context of social threat may be a consequence of bullying victimisation. Further whilst longitudinal research is needed before firm conclusions on

causality can be reached, this finding can tentatively be used with respect to this thesis' overall aim to better understand the functional relationship between bullying victimisation and alcohol-misuse. If emotional problems and a hypervigilance for threat are a consequence of victimisation, then victims may turn to alcohol in order to dampen down these adverse emotional reactions; thereby supporting a causal model of comorbidity between victimisation and alcohol-misuse. The next Chapter will extend this investigation into the emotional vigilance of victims, by investigating whether this hypervigilance, or arousal exists at a neural level within specific cognitive and emotional brain regions.

## **Chapter 6: RESPONSIVITY TO EMOTIONAL FACES IN A GROUP OF COMBINED VICTIMS OF BULLYING AND TRAUMA-EXPOSED ADOLESCENTS: NEUROLOGICAL ANALYSES**

### **6.1 Abstract**

**Objective:** This Chapter aimed to 1) investigate neural activation to angry and ambiguous facial expressions in a combined sample of victims and trauma-exposed participants and to compare to a group of uninvolved adolescents; 2) investigate the role of emotional symptoms in both neurological responsivity for emotional faces, as well as in the functional relationship between victimisation and alcohol-use.

**Method:** Participants (n=272, mean age=14.41) were recruited from schools across 8 different studies sites in Europe, as part of the IMAGEN project. Participants were assessed across 1 or 2 sessions at both their home, using a computer-based programme and at their local research centre.

**Results:** No group differences were shown for neurological activation to angry faces. Group differences were suggested for amygdala activation in response to ambiguous faces ( $p=.06$ ). A victim-group with high levels of emotional impact showed increased activation in the anterior cingulate for emotional faces. Emotional symptoms were associated with increased activation in different brain regions for both the combined-victim and uninvolved control adolescents groups; the orbitofrontal cortex was activated in both groups. Emotional symptoms mediated the relationship between victimisation and alcohol-use.

**Conclusions:** This Chapter has shown that adolescents exposed to trauma or victimisation perceive social cues differently to their uninvolved peers. Emotional symptoms have been implicated in this difference between groups. This suggests that prevention programmes should target victims' emotional symptoms in order to indirectly target these differential neural activation patterns as well as the adverse consequences association with victimisation, such as increased alcohol-use.

## **6.2 Introduction**

The previous Chapter provided evidence to show that victims of bullying display a cognitive hypervigilance for fear, when in the context of a threatening social stimulus (i.e. angry faces). The level of victims' fear vigilance was shown to be similarly high to that exhibited by adolescents who have been exposed to a trauma, yet different from uninvolved 'control' participants (who displayed lower levels of fear vigilance). The current study will aim to extend this work by investigating the neurological response to threatening or ambiguous social cues in a group of 'combined-victims'; i.e. those who have experienced either bullying victimisation or an extreme trauma. The response of this combined group of victims will be compared to a group of uninvolved 'control' participants. Further, Chapter 4 showed the pivotal role played by emotional symptoms in the risk for victimisation. This Chapter will therefore investigate the association between these emotional symptoms and victims' neural response to threatening or ambiguous faces. Finally, emotional symptoms will be investigated for their role in the functional relationship between bullying victimisation and alcohol-use.

Response to stressful situations has been shown to be reliant on information received by brain regions involved in the sensory nervous system (such as the thalamus and insula) (LeDoux, 1992; Phan et al., 2002), as well as areas included in the 'limbic system' (implicated in the regulation of affective states), such as the amygdala (e.g. Young et al., 1994; Adolphs, 2001). Nelson and colleagues (2005) outline the 'social brain network', which incorporates a circuit of brain regions, including the medial prefrontal cortex, the anterior cingulate, the amygdala and the insula that are thought to work together in order to detect, categorise and regulate response to social stimuli, as well as to ascribe meaning and significance to situations (e.g. LeDoux, 1996; Bush et al., 2000; Charney, 2004; Frith, 2007; Dalgleish et al., 2009; Carlson et al., 2011).

Cognitive and emotional centres of the brain, such as those involved in the social brain network, have been implicated in the response to threatening stimuli. Specifically, areas within the limbic region (including the amygdala, hippocampus, and thalamus) are thought to communicate with frontal brain regions (e.g. the orbitofrontal cortex) for the perception of threat, the retrieval of emotional memories and the subsequent regulation or adaptation



of behaviour (e.g. Adolphs, 2001; Phan et al., 2002; Charney, 2004; Ochsner & Gross, 2005; Carlson et al., 2011).

Adolescents who have been exposed to severe trauma, such as disasters, abuse, or violent attacks, have been shown to display differential activation levels within both emotional and cognitive brain centres. For example, Yang (2004) assessed neural activation patterns for two groups of adolescents (aged 12 to 14 years old) who had experienced an earthquake; one group (n=5) met the diagnostic criteria for Post Traumatic Stress Disorder (PTSD), whilst the other group did not (n=6). Using a functional magnetic resonance imaging (fMRI) technique, both groups of adolescents were presented with earthquake related images, as well as neutral stimuli. Results showed that the earthquake imagery in contrast to neutral images evoked increased activation in the anterior cingulate cortex for the non-PTSD group only. Whilst the interpretation of these results is limited due to the small sample size, this study suggests that differential neural activation as a consequence of trauma, may be influenced by an individual's emotional response to the trauma.

Whilst no identified study has focused on the neurological effect of victimisation from bullying, the consequences of social rejection have been investigated using a 'cyberball' fMRI paradigm (Eisenberger et al., 2003; Masten et al., 2009; Sebastian et al., 2011). The 'cyberball' task consists of two conditions: participant 'inclusion' and participant 'exclusion' within a virtual ball throwing game. Increased activation in the prefrontal cortex regions in addition to the anterior cingulate was shown in response to social rejection in a recent study with female adolescents (aged 14 to 16 years old) (Sebastian et al., 2011). In a previous study of 23 adolescents (aged 12 to 13 years old), social exclusion evoked increased activation in both the insula and anterior cingulate cortex. Greater levels of self-reported distress were associated with increased activation of both the insula and subgenual anterior cingulate cortex, a finding that contrasted to that reported by Yang (2004). The right ventrolateral prefrontal cortex was negatively related to distress, whilst lower levels of distress were also associated with activity in the ventral striatum, an area which was implicated in the regulation of the anterior cingulate cortex. Results from this study suggest that the prefrontal cortex may play a regulatory role in the experience of negative

affect; adolescents who show increased vigilance for peer acceptance and rejection demonstrate increased neural reactivity to distressing social situations (Masten et al., 2009).

#### *6.1.1 Aims and Hypotheses*

This Chapter aims to further investigations into the effect of trauma on emotional responsivity, by investigating neural activation to angry and emotionally-ambiguous facial stimuli. In the previous Chapter, victims of bullying were shown to respond cognitively similarly to those adolescents who had been exposed to trauma. As such, in order to increase statistical power, this chapter will utilise a ‘combined-victim’ group, consisting of both victims of bullying and trauma-exposed adolescents, to compare the neural functioning of these combined-victims to a group of control participants, who have experienced neither victimisation nor trauma. Based on a review of the literature a-priori neural regions will be investigated: the amygdala, hippocampus, insula, orbitofrontal cortex, anterior cingulate cortex, putamen, caudate and thalamus. It is hypothesised that angry faces will elicit an increased activation within these regions for the combined-victim group, in comparison to a group of non-exposed control participants. The findings from Chapter 5 showed that the victim groups were most distinguished from non-exposed ‘control’ youth when responding to emotionally ambiguous information (i.e. fearful faces) in a threatening context. Accordingly, this study will also include an ambiguous faces condition.

Finally, Chapter 4 implicated the development of emotional symptoms within both the risk for, and consequences from victimisation. This Chapter will therefore investigate the association between emotional symptoms and neural activation within the specified regions of interest. Based on the study by Masten and colleagues (2009), it is hypothesised that higher levels of emotional symptoms will be associated with increased activation to angry and ambiguous faces for a combined-victim group of adolescents. Finally, with respect to the overall aim of this thesis to understand the functional relationship between victimisation and alcohol-misuse, the role of emotional symptoms in this relationship will be investigated.

## **6.3 Method**

### *6.3.1 Participants*

Participants for these analyses were recruited as part of the European IMAGEN project (see Chapters 2 and 5 for a full summary of the recruitment procedure). Phenotypic and neuroimaging quality control procedures had been completed for all relevant measures at the time of writing for 305 participants. Only right handed participants were included in the analyses, which resulted in the exclusion of 33 participants. The final sample totalled 272 adolescents (mean age=14.41, SD=0.34), of which 55.5% were female.

### *6.3.2 Testing Setting*

Participants were tested both at home and at their local institute over 1 or 2 visits. Measures included within this chapter were assessed as part of both the home and institute assessments (see Chapters 2 or 5 for further details on the home assessment). The institute assessment consisted of cognitive and behavioural tasks and two magnetic resonance imaging (MRI) sessions lasting 45 minutes each (to acquire a combination of structural and functional MR scans). All images were acquired on 3-Tesla magnetic resonance scanners. In the scanner, participants were equipped with a goggle system for visual stimulation (NordicNeuroLab, Bergen, Norway) and received brief visual and verbal reminders of the task instructions before commencement of the task.

### *6.3.3 Measures*

The following measures were administered:

#### *6.3.3.1 Demographic Questionnaire*

Participants were asked to provide information on gender, age and school grade during the recruitment procedure. Data on ethnicity was collected as part of a family history questionnaire completed as part of a semi-structured interview administered to the parent/guardian by a trained researcher.

#### *6.3.3.2 Neural Activation to Emotional Stimuli*

A functional MRI task was adapted from a faces task created by Grosbas and Paus (2006). Participants passively watched 18-seconds blocks of short (2-5 seconds) black and white video clips that presented five different male and female faces with animated angry or ambiguous (e.g. nose twitching) facial expressions as well as control non-biological motion stimuli (concentric circles). Five blocks for both the angry and ambiguous facial stimuli were randomly interspersed with nine blocks of animated (expanding and contracting) concentric circles. After the scanning session, participants completed a short recognition task in order to ensure that they sufficiently attended to the task. For the purposes of this study, analyses will focus on a) the ambiguous faces versus control contrast; i.e. brain activation for ambiguous faces once the activation for the control stimulus has been removed, and b) the angry faces versus control contrast; i.e. brain activation for angry faces once the activation for the control stimulus has been removed. The use of these contrasts, which remove any brain activation achieved from viewing the control stimuli, increases confidence that the subsequent analyses are examining brain activation caused from viewing the facial expressions (rather than non-specific brain activation which could be created by looking at any random object).

#### *6.3.3.3 Emotional Symptoms*

Emotional symptoms were assessed using 5 items from the 'Strengths and Difficulties Questionnaire' (SDQ, Goodman, 1997). The items assessed physiological complaints, negative affect and anxiety-proneness (e.g. 'I get a lot of headaches, stomach-aches or sickness'; 'I am nervous in new situations'). For each item participants indicated on a three point scale how the statements reflected their behaviour over the past six months (1=not true, 2=somewhat true, 3=certainly true). Emotional symptoms were measured using a composite score of each item. Impact scores that assess overall distress and social impairment from emotional symptoms were assessed using a further 5 items (e.g. difficulties upset or distress me; interfere with home life; interfere with friendships; interfere with classroom learning; interfere with classroom activities). For each item participants answered on a 4-point scale (1=not at all to 4=a great deal). A total impact score was measured using a composite score of each item.

#### *6.3.3.4 Bullying Victimization*

Adolescent victimisation from bullying was assessed using a ‘bullying questionnaire’ measure amended from questions used in the large international study entitled: Health Behaviour in School aged Children study (HBSC) (see Currie, et al., 2008), which were amended from the Revised Olweus Bully/Victim Scale (Olweus, 1996).

As described in detail in Chapter 2, the questionnaire consisted of three-items which detailed three types of victimisation (verbal, relational and physical bullying). Chronic victims were identified as those participants who had experienced one or more type of bullying at least two or three times per month in the past six months. For the purposes of the final analysis within this Chapter, The victimisation items were summed together to create a composite ‘frequency of victimisation’ variable.

#### *6.3.3.5 Trauma Exposure*

Participants who had been exposed to trauma were identified during the institute assessment using the ‘Development and Well-Being Assessment’ (DAWBA, Goodman et al, 2000). Those participants who answered ‘yes’ to a PTSD screening question (see Chapters 2 and 5 for more detail) were categorised as part of the trauma-exposed group.

#### *6.3.3.6 Alcohol Consumption*

Alcohol consumption was assessed using a ‘quantity and frequency’ (QxF) of alcohol-use composite score. Drinking quantity was measured by asking participants to answer on the number of standard alcoholic beverages typically consumed on one drinking occasion over the past 30 days (according to a 5-point scale between zero and more than 10). Drinking frequency was assessed by asking students to report how often they normally drank alcohol over the same 30 day period, by using another 5-point scale (1=never to 5=daily).

### **6.4 Data Analysis**

In the previous Chapter, results showed that victims of bullying and trauma-exposed adolescents displayed similar levels of cognitive vigilance to fearful emotional faces in the context of anger. Subsequently, and in order to enhance power within these current

analyses, victims and trauma-exposed participants were grouped together into a combined-victim group. The combined-victim group included participants who had experienced chronic victimisation from bullying over the past six months (n=34), exposure to trauma (n=31), or both victimisation and trauma exposure (n=7). Non-exposed ‘control’ participants were categorised as those participants who had experienced neither victimisation nor trauma exposure (n=121). Seventy-nine participants were excluded from further analyses due to experiencing some form of bullying victimisation, which was not frequent enough to be classified as chronic victimisation for the purposes of these analyses.

The IMAGEN study was conducted across eight European study sites. The impact of clustering by site upon the data was assessed using the ‘variance components’ methodology within SPSS. Controlling for the effect of site is not deemed to be necessary if unconditional models reveal that less than 10 percent of systematic variance exists at the between site level (Lee, 2000). Analyses revealed that between 0 and 5.5 percent of the variance in region of interest activation was accounted for by intra-cluster correlations. As such, the data for all further analyses were collapsed across the different sites.

#### *6.4.1 fMRI data collection and preparation*

Functional magnetic resonance data were obtained in all eight study sites using 3-Tesler scanners. The same scanning protocol was used in all sites: high-resolution T1-weighted 3D structural images were acquired for anatomical localization and co-registration with the functional time-series. Blood oxygen-level dependent (BOLD) functional images were created with a gradient-echo, echo-planar imaging (EPI) sequence. For each participant, 160 volumes were collected, each consisting of 40 slices (slice thickness: 2.4 mm, 1 mm gap, matrix : 64mm<sup>2</sup>) parallel to the anterior commission/ posterior commission line. A short echo-time (TE=30 ms, TR=2.2s) was used to enhance the imaging reliability of subcortical regions. Preprocessing was conducted using SPM-8 (Statistical Parametric Mapping: <http://www.fil.ion.ucl.ac.uk/spm>), which included slice-timing correction, spatial realignment to the first volume and non-linear warping on the MNI space. Finally, images were smoothed using a Gaussian kernel of 5-mm full-width at half-maximum.

#### *6.4.2 fMRI outlier analyses*

All brain images were individually viewed to check for medical abnormalities. Outliers were identified at both the task specific and contrast specific level. Task specific outliers include outliers created due to artefacts in the scanner. Contrast specific outliers included checks for extreme movement in both subcortical and cortical regions of the brain. These were calculated using a multivariate approach, which allows checks to be conducted simultaneously within larger areas of the brain (rather than at each voxel). Individuals who were shown to surpass a multivariate determined threshold were excluded from further analyses (n=7).

#### *6.4.3 fMRI Regions of Interest*

Eight bilateral structural regions of interest were acquired (amygdala, hippocampus, insula, putamen, thalamus, anterior cingulate cortex, inferior orbital frontal cortex, and caudate), using the anger versus control faces task contrast, for all included participants. The regions of interest were generated using the AAL regions of interest library (a library which includes various structural regions of interest already prepared from template brains) within marsBaR toolbox version 0.42 (Brett, Anton, Valabregue, & Poline, 2002), adapted for the SPM-8 software package. The regions of interest acquired are specific for each contrast, as such the procedure for acquiring regions of interest was repeated in order to acquire eight regions of interest for the ambiguous faces versus control stimuli.

#### *6.4.4 Behavioural Analyses*

Multivariate analyses of covariance were conducted to investigate between group differences in brain activation patterns for both ambiguous and angry faces. The anger and ambiguous face paradigms were contrasted to a 'control' stimulus and analysed separately. The grouping variable was included in the analyses as the fixed factor, to allow the combined-victim group to be compared to the non-exposed participants; i.e. those individuals who have experienced neither bullying victimisation nor exposure to trauma. Analyses controlled for the effect of gender.

Results from Chapter 4 showed that emotional symptoms were pivotal in the risk for bullying victimisation across an 18-month period in both the Preventure and Adventure samples. Further, within the DSM-IV (APA, 1994), mental health symptoms are considered more severe when they show a detrimental impact to the individual's daily life. Information on the impact of experiencing emotional symptoms was not available for data analyses using the Preventure and Adventure studies (for Chapter 4), however, this information was available for the IMAGEN study. Subsequently, a post-hoc sub-analysis was performed which included only those combined-victims who reported emotional symptoms which were associated with moderate to severe levels of impact (scores > 2; N=14). The non-exposed participants were also filtered to include only those participants who reported no impact (scores = 0; N=100). The aim of this analysis was to investigate neural activation patterns for this potentially more severely effected sub-group of combined-victims. Due to the small sample size of this subgroup of combined-victims, these analyses can only suggest the effect that emotional symptoms may have on neural activation patterns. As such, due to greater statistical power, the remaining analyses will be conducted on the larger groups of combined-victim and non-exposed groups.

Finally, partial correlations were conducted with the full sample (controlling for the effect of gender) to investigate the relationships between brain activation in the regions of interest to ambiguous and angry faces, over and above any activation accounted for by the concentric circle control stimuli, and emotional symptoms. This relationship was assessed separately for the combined-victim and non-exposed comparison group.

#### *6.4.5 Assessing the comorbidity between victimisation and alcohol-use*

Using data from 3 separate studies (Preventure, Adventure, IMAGEN), previous analyses within this thesis have shown that emotional symptoms are indirectly implicated in the relationship between victimisation and alcohol-misuse. Consequently, the final analyses in this Chapter will investigate whether the negative impact from emotional symptoms can account for the possible causal relationship between victimisation and alcohol-use. Linear regression models will assess the paths between victimisation and alcohol-use; victimisation and emotional impact scores; and emotional impact scores and alcohol-use.



In order to assess the effect of emotional impact, bootstrapping mediation analyses will be conducted using 5000 bias corrected and accelerated bootstrapped confidence intervals, using a macro developed for SPSS by Preacher and Hayes (2004). Indirect effects are present when the confidence intervals do not include 0. The indirect effect is subsequently significant at  $p < .05$  (see Chapter 3, section 3.4 for more information on mediation). All analyses controlled for gender.

## 6.5 Results

### 6.5.1 Angry Faces versus Control Stimulus

Table 6.1 shows the means and standard deviations of the neural activation within the eight regions of interest for the fMRI faces task investigating neurological activation to angry faces (excluding any effect accounted for by viewing the control stimuli). An analysis of these scores was conducted using multivariate analysis of covariance with the non-exposed versus combined-victim group as the fixed factor. Results showed no significant differences between groups.

An analysis of covariance was then conducted to compare the subset of combined-victims who reported emotional symptoms with high levels of impact, to a group of non-exposed participants (see Table 6.1). Results showed a significant between-groups difference in the right anterior cingulate, indicating increased activation to angry faces, with the combined-victim group showing greater activation than the non-exposed group,  $F(1, 111) = 3.96$ ,  $p < .05$ .

Finally, partial correlations were conducted, which controlled for gender, within each group separately to investigate the association between emotional symptoms and brain activation within the eight regions of interest. Results revealed no significant associations within the non-exposed group. Within the combined-victim group a positive relationship was shown between emotional symptoms and bilateral activation within the anterior cingulate (left:  $r = .23$ ,  $p \leq .05$ ; right:  $r = .29$ ,  $p < .05$ ) (see Figure 6.1 below).

**Table 6.1 Mean activation within regions of interest for the angry faces**

					Impact based subgroups	
		Whole Sample (N=193)	Non-exposed (N=121)	Combined-victims (N=72)	Non-exposed (N=100)	Combined-victims (N=14)
Region of Interest	Hemisphere					
Amygdala	Left	.30 (.31)	.30 (.32)	.28 (.29)	.27 (.30)	.23 (.30)
	Right	.30 (.30)	.31 (.32)	.28 (.28)	.29 (.32)	.18 (.30)
Caudate	Left	.03 (.24)	.03 (.25)	.03 (.24)	.02 (.25)	.10 (.24)
	Right	.03 (.21)	.03 (.23)	.02 (.20)	.03 (.24)	.02 (.25)
Anterior Cingulate	Left	-.10 (.28)	-.10 (.27)	-.11 (.29)	-.09 (.27)	.01 (.28)
	Right	-.07 (.22)	-.08 (.22)	-.06 (.22)	-.07 (.21)*	.05 (.23)*
Inferior OFC	Left	.02 (.22)	.01 (.23)	.04 (.20)	.01 (.22)	.09 (.14)
	Right	.05 (.20)	.05 (.21)	.06 (.18)	.05 (.21)	.05 (.17)
Hippocampus	Left	.12 (.19)	.13 (.19)	.11 (.17)	.12 (.19)	.18 (.22)
	Right	.14 (.18)	.14 (.19)	.14 (.17)	.13 (.18)	.12 (.20)
Insula	Left	-.01 (.19)	-.01 (.20)	-.02 (.18)	-.01 (.20)	.00 (.20)
	Right	-.04 (.22)	-.05 (.24)	-.01 (.20)	-.06 (.25)	.01 (.19)
Putamen	Left	.02 (.17)	.03 (.17)	.01 (.16)	.02 (.17)	-.01 (.17)
	Right	.03 (.18)	.02 (.19)	.05 (.16)	.01 (.20)	.05 (.18)
Thalamus	Left	.02 (.17)	.02 (.18)	.03 (.16)	.01 (.18)	.05 (.16)
	Right	.05 (.17)	.04 (.19)	.06 (.15)	.02 (.19)	.03 (.11)

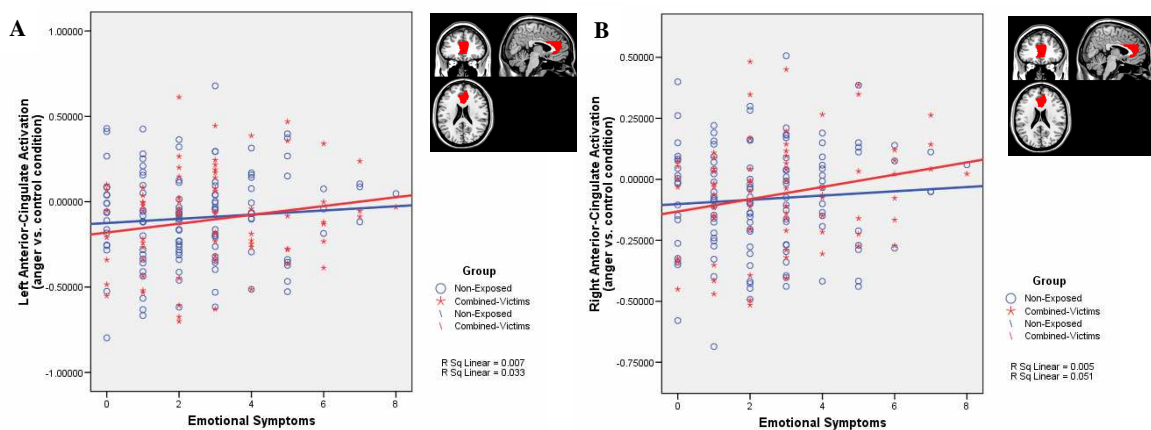
NB: standard deviations in parentheses

\* significant between group difference,  $p < .05$

### 6.5.2 Ambiguous Faces versus Control Stimulus

Table 6.2 shows the means and standard deviations of the neural activation within the eight regions of interest for the fMRI faces task investigating neurological activation to ambiguous faces. An analysis of these scores was conducted using multivariate analysis of covariance with the non-exposed versus combined-victim group as the fixed factor. Results showed a trend for a group difference in the left amygdala:  $F(1,183)=3.56$ ,  $p=.06$ , which suggests increased activation to ambiguous faces (when contrasted to a control stimulus), with the combined-victim group showing greater activation than the non-exposed group.

Similarly to the previous analyses, an analysis of covariance was conducted to compare the subset of combined-victims who reported emotional symptoms with high levels of impact, to a group of non-exposed participants. Results showed a trend for a between-groups difference in the right anterior cingulate, indicating increased activation to ambiguous faces, with the combined-victim group showing greater activation,  $F(1, 107)=3.14, p=.08$ .



**Figure 6.1** Plots to show the significant correlations within regions of interest between emotional symptoms and neural activation to angry faces for the combined-victim group; correlations for the non-exposed participants are included as a comparison

Partial correlations were conducted, which controlled for gender, within each group separately to investigate the association between emotional symptoms and neurological activation to ambiguous faces. Results revealed different significant positive associations within the non-exposed group and the combined-victim group. Within the combined-victim group a significant positive association was shown between emotional symptoms and bilateral activation within the anterior cingulate (right:  $r=.34, p<.01$ ; left:  $r=.31, p<.01$ ); the right amygdala ( $r=.24, p<.05$ ); and the right orbitofrontal cortex ( $r=.24, p<.05$ ). Within the non-exposed control group, significant positive associations were shown between emotional symptoms and neural activation within the caudate ( $r=.20, p<.05$ ); bilaterally within the orbitofrontal cortex (right:  $r=.18, p<.05$ ; left:  $r=.201, p<.05$ ); bilaterally within

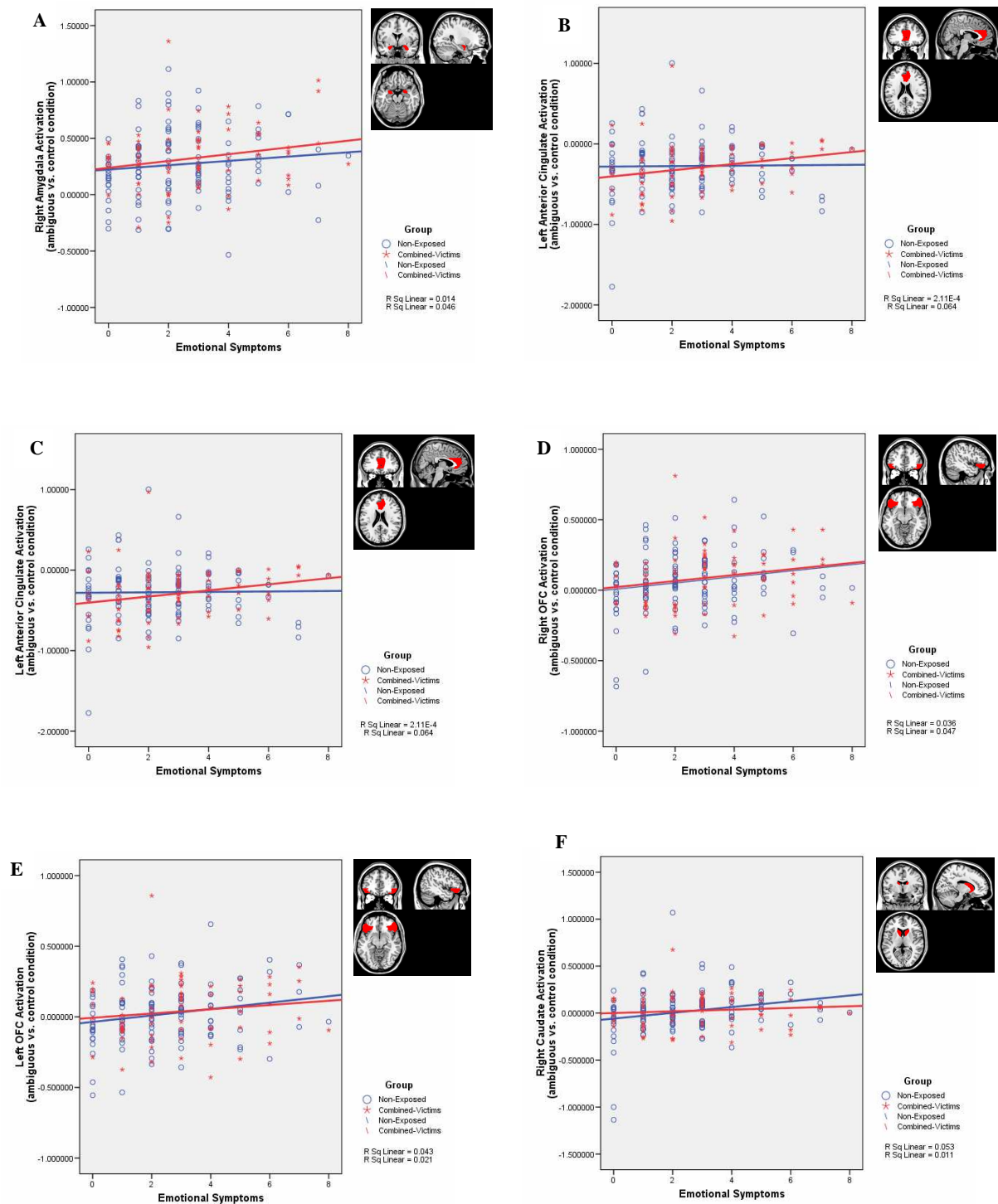
the hippocampus (right:  $r=.18$ ,  $p\leq.05$ ; left:  $r=.20$ ,  $p<.05$ ); and within the right thalamus ( $r=.19$ ,  $p<.05$ ) (see Figure 6.2 below).

**Table 6.2 Mean activation within regions of interest for ambiguous faces**

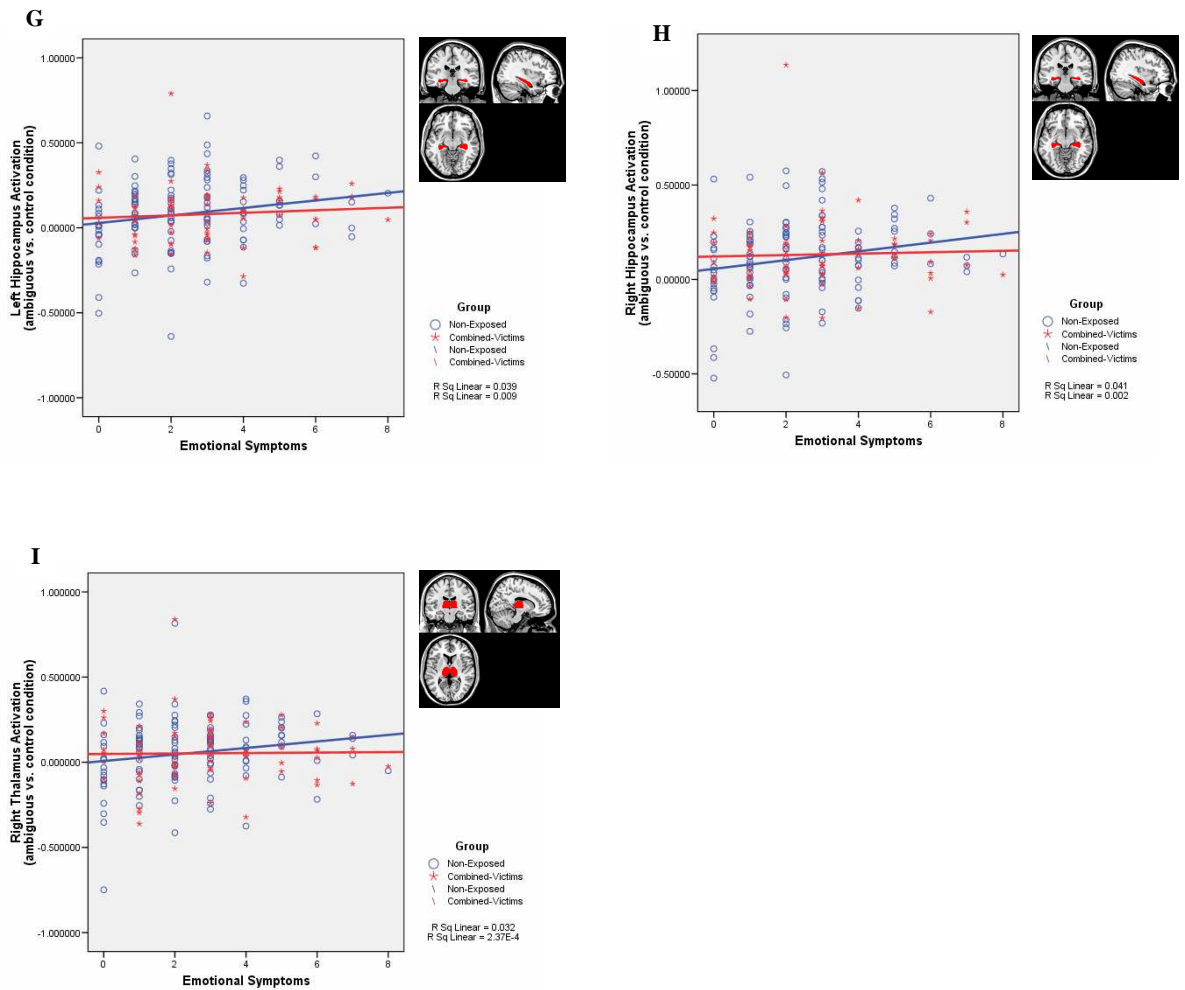
					Impact based subgroups	
		Whole Sample (N=186)	Non-Exposed (N=116)	Combined-victims (N=70)	Non-Exposed (N=96)	Combined-victims (N=14)
Region of Interest	Hemisphere					
Amygdala	Left	.24 (.32) <sup>++</sup>	.21 (.33) <sup>++</sup>	.30 (.29)	.17 (.32)	.29 (.19)
	Right	.29 (.28)	.27 (.29)	.31 (.26)	.24 (.28)	.33 (.27)
Caudate	Left	.00 (.21)	-.01 (.22)	.02 (.19)	-.01 (.23)	.07 (.14)
	Right	.02 (.18)	.01 (.20)	.02 (.16)	.00 (.20)	.08 (.12)
Anterior Cingulate	Left	-.29 (.27)	-.28 (.28)	-.30 (.26)	-.27 (.27)	-.19 (.28)
	Right	-.20 (.23)	-.21 (.23)	-.20 (.21)	-.21 (.23) <sup>+</sup>	-.10 (.21) <sup>+</sup>
Inferior OFC	Left	.02 (.19)	.02 (.19)	.03 (.18)	.01 (.18)	.06 (.17)
	Right	.06 (.19)	.06 (.20)	.07 (.18)	.05 (.18)	.10 (.20)
Hippocampus	Left	.08 (.18)	.09 (.20)	.07 (.13)	.06 (.19)	.12 (.07)
	Right	.12 (.18)	.12 (.20)	.12 (.14)	.10 (.20)	.12 (.13)
Insula	Left	-.04 (.17)	-.04 (.18)	-.04 (.15)	-.05 (.18)	.03 (.08)
	Right	-.05 (.20)	-.04 (.21)	-.06 (.18)	-.05 (.20)	.00 (.11)
Putamen	Left	.01 (.17)	.02 (.17)	-.00 (.16)	.01 (.17)	.04 (.10)
	Right	.04 (.16)	.04 (.17)	.02 (.14)	.03 (.16)	.05 (.11)
Thalamus	Left	.01 (.16)	.01 (.16)	-.00 (.15)	-.00 (.17)	.05 (.15)
	Right	.05 (.16)	.05 (.17)	.04 (.15)	.03 (.17)	.01 (.11)

<sup>+</sup>p=.06; <sup>++</sup> p=.08

NB. Standard deviations are shown in parentheses.



**Figure 6.2** Plots to show the significant correlations between emotional symptoms and neural activation to ambiguous faces for the combined-victim group and the non-exposed comparison group



**Figure 6.2b** Plots to show the significant correlations between emotional symptoms and neural activation to ambiguous faces for the combined-victim group and the non-exposed comparison group

### 6.5.3 Assessing the comorbidity between victimisation and alcohol-use

Emotional impact scores were shown within these analyses to be important in differentiating between combined-victims and uninvolved control participants with respect to neural activation patterns. The final analyses of this Chapter assessed the effect of these emotional impact scores on the functional relationship between bullying victimisation and alcohol-use. Similarly to results from Chapter 4, linear regression models showed no significant direct relationship between bullying victimisation and alcohol consumption levels ( $\beta=.03$ ,  $p=.60$ , ns). Bullying victimisation was associated with emotional impact

scores ( $\beta=.36$ ,  $p<.001$ ), and emotional impact scores were associated with alcohol-use ( $\beta=.22$ ,  $p<.001$ ). Bootstrapping analyses showed an indirect relationship between bullying victimisation and alcohol-use, through higher emotional impact scores (95% CI: .1107 to .5278). This result suggests that victims of bullying who experience negative emotional impact from their experiences will be more likely to increase their alcohol consumption levels.

## **6.6 Discussion**

The main aim of this Chapter was to assess whether a combined-victim group would display an increased neural vigilance for emotionally threatening stimuli, in addition to their cognitive hypervigilance for fear already reported in Chapter 5. Secondly, this Chapter aimed to investigate whether a neural response for emotional stimuli is related to increased levels of emotional symptoms. This is the first study of its kind to assess the neural response of adolescent victims of bullying or trauma to threatening social stimuli within a-priori specified cognitive and emotional centres of the brain. Results showed that only those participants in the combined-victim group who had reported adverse impact from their experiences displayed differential neural activation levels in comparison to non-exposed adolescents. This subgroup of combined-victims showed increased activation in the anterior cingulate in response to both angry and ambiguous faces. Further, within the combined-victim group, higher levels of emotional symptoms were related to increased activation of the anterior-cingulate in response to both angry and ambiguous faces. Emotional symptoms were also related to increased activation of the amygdala and the orbitofrontal cortex in response to ambiguous faces for the combined-victim group. With respect to the overall aim of this thesis to investigate the functional relationship between bullying victimisation and alcohol-use, the final analyses of this Chapter showed an indirect relationship between bullying victimisation and alcohol consumption levels through the development of negative emotional impact.

### *6.6.1 Neural correlates of emotional face perception*

Ambiguous faces elicited increased activation within the amygdala for the combined-victim group, in comparison to the control group. The amygdala is commonly referred to as the ‘fear’ centre within the brain (LeDoux, 1996; Dalglish et al., 2009). Activation of this brain region in response to ambiguous faces, therefore suggests that stimuli which are ambiguous with regards to their level of social threat, elicit a response which is similar to a fear response. This result supports previous research, indicating that amygdala activation levels reflect the extent to which an individual feels safe and comfortable within a social situation; perception of personally familiar faces has been shown to evoke lower levels of amygdala activation in comparison to unfamiliar faces which led to an increased amygdala response (Gobbini, Leibenluft, Santiago, & Haxby, 2004).

A smaller sub-sample of combined-victims, who reported increased emotional symptoms with a high level of negative impact, showed a heightened response within the anterior cingulate to ambiguous faces. In response to angry faces, no significant differences were shown between groups. Similarly to the findings for ambiguous faces, a sub-sample of combined-victims who reported higher levels of emotional impact from their experiences, displayed heightened activation within the anterior cingulate in response to angry faces, in comparison to a low-impact non-exposed group. This result mirrors the previous result shown for ambiguous faces and supports previously published fMRI studies: increased activation of the anterior cingulate has been reported in non trauma-exposed adolescents’ response to angry and sad faces (Blair et al., 1999); in response to social ostracism for those adolescents who reported greater levels of distress (Masten et al., 2009); and in a group of trauma-exposed adolescents (who did not meet diagnostic criteria for PTSD) when exposed to traumatic reminder stimuli (Yang, 2004). The anterior cingulate is closely linked to the medial prefrontal cortex (which includes the orbitofrontal cortex) (Bush et al., 2000), and has been described as a ‘neural alarm’ for emotionally distressing stimuli (see Eisenberger et al., 2003). The results from this current study suggest that in a similar manner to the investigation into social ostracism (Masten et al., 2009), a greater impact from emotional symptoms is necessary in order for this differential response to threatening social stimuli to become apparent.



In the absence of a fearful face within this functional MRI paradigm, ambiguous faces can be thought of as being somewhat similar to a ‘fear’ condition. Compared to anger, fear is the less prevalent social cue, and therefore is more ambiguous with regards to the source of threat and therefore interpretation of intent (Whalen et al., 1998). Further, emotionally ambiguous stimuli and conditioned fear have been shown to be regulated by a common amygdala-prefrontal circuitry (Bishop, 2007). In this respect, ambiguous faces show similar qualities to a fearful face, which helps to explain the heightened activation of the anterior cingulate shown in response to both angry and ambiguous faces.

#### *6.6.2 Associations between emotional symptoms and neural processing*

Following results from Chapter 4, which showed that emotional symptoms were pivotal for both the causes and consequences of victimisation, the second aim of this Chapter was to test for associations between emotional symptoms and neural activation to emotional face stimuli. Results showed that higher levels of emotional symptoms were related to increased neural activation in response to both ambiguous and angry faces within the combined-victim group and in response to ambiguous faces for the non-exposed comparison group. Interestingly, whilst both groups showed increased activation in association with emotional symptoms to ambiguous faces, the groups showed this activation within different regions; the only region to activate within both groups was the orbitofrontal cortex, a brain region which is closely connected to the anterior cingulate for the regulation of cognitive and emotional processing in response to social cues (Bush et al., 2000). The victim group showed activation within the anterior-cingulate for both angry and ambiguous faces, as well as the amygdala for ambiguous faces. These results corroborate the previous findings, as well as supporting the previous study by Masten and colleagues (2009). These results suggest that those adolescents who have experienced either trauma or victimisation, and who have developed emotional symptoms, are more likely to display an increased neural response within specific brain regions. Accordingly, emotional symptoms which have already been implicated in the risk for victimisation (see Chapter 4), also seem to differentiate victims from their non-exposed peers with regards to their response to social cues; a difference which may be indicative of changes to victims’ social information processing.

#### *6.6.4 Assessing the comorbidity between bullying victimisation and alcohol-use*

Results from Chapters 4 and 5 have shown that emotional symptoms are important for both the risk for and consequences from bullying victimisation. The current study went one step further to show that emotional symptoms were related to the neural reaction to threatening or ambiguous social cues. As such, the final analyses of this Chapter extended these results further to assess the role of negative emotional impact in the relationship between victimisation and alcohol-use. Results showed that higher levels of negative impact lead to an indirect relationship between bullying victimisation and increased alcohol consumption. No direct relationship was shown between bullying victimisation and alcohol consumption levels, which supports the findings from Chapter 4, which used data from the Preventure study. Information on alcohol-related problems was not analysed for the IMAGEN project, due to the sample showing a lack of meaningful variability, possibly due to being too young at 14 years of age. However, this result suggests that the causal pathway between victimisation and alcohol-misuse shown within Chapter 4 may be accounted for by the negative impact of victims' experiences. Future research should therefore explore the effect of negative emotional impact at both the cognitive and neural level in the risk for alcohol-related problems. This study did not investigate whether the association shown between emotional symptoms and neural activation effected drinking, as it was not possible to control for a potential bi-directional relationship; i.e. whether victimisation leads to neural emotional activation and this increases the risk for drinking, or whether alcohol-use independently influences an increased neural activation to emotional cues.

#### *6.6.4 Experimental Limitations*

This Chapter has provided novel findings regarding the association between adverse experiences in adolescence and neural responding to social cues. However, there are a number of limitations to this study which must be taken into account when interpreting these results. Firstly, the fMRI faces task did not include a fear condition. Ambiguous faces have been utilised within these analyses in the absence of fearful faces, however, the two conditions cannot be directly comparable and therefore interpretation of the 'ambiguous' results should be taken with caution.

Secondly, this Chapter identified a smaller sub-sample of adolescents who had been exposed to bullying victimisation or trauma and who also reported increased levels of emotional impact. Differences were suggested between the groups, however, analyses using this sub-sample were statistically underpowered. Subsequently, whilst these results implicate the impact of emotional symptoms to be influential in neural responding, these results need to be replicated within a larger sample before any firm conclusions can be drawn.

Thirdly, in Chapter 5, which investigated cognitive emotional processing, victims of bullying did not significantly differ from those adolescents who had experienced a severe life trauma. In order to increase power for analyses, this current Chapter combined these two groups of adolescents to assess neurological processing and associations with emotional symptoms. Whilst this was justifiable conceptually, these groups of adolescents may show some differences, and a larger sample would enable these differences to be explored.

Fourthly, a further limitation can be seen with regards to the identification of the trauma-exposed group. This was done using a screening question for post-traumatic stress disorder, which asked participants to think back over their whole life. As such, participants within this group may behave differently, depending on when they experienced their trauma and the current and previous impact of this event. Further, this question did not differentiate between those who had experienced a one-off or a repeated trauma. It would be interesting to assess this in future research to investigate whether participants exposed to a repeated trauma would behave more similarly to victims of bullying than those adolescents who have been exposed to a one-off trauma.

Finally, data from the IMAGEN project has shown that victimisation is related to alcohol-use through the experience of negative emotional impact. Information on alcohol-misuse and dependence symptoms were available within the IMAGEN project, however the sample was possibly too young at 14 years of age to have meaningful variability. This association will be able to be better investigated within the follow-up stage of the project,

during which participants will be 16 years old. Previous studies have shown that increased alcohol-use can lead to alcohol-misuse, therefore the results from the current analyses provide indirect evidence to suggest that negative emotional impact may explain the predictive relationship between bullying victimisation and alcohol-misuse. Further research is needed to directly investigate this association.

#### *6.6.4 Conclusions*

The findings from this Chapter suggest that adolescents who have been exposed to either victimisation from bullying or a severe trauma are more likely to perceive social cues differently to their non-exposed peers. Accordingly, these results suggest that exposure to bullying victimisation or trauma may effect adolescents' social information processing (Crick & Dodge, 1994). This may lead to the misinterpretation of social situations and subsequent inappropriate behavioural responses, which increase the risk for chronic victimisation (e.g. Eisenberg et al., 2000). Additionally, the development of emotional symptoms was associated with an increased neurological activation for both ambiguous and threatening stimuli. This result extends findings from previous Chapters and thereby implicates displays of negative emotions in both the risk for, and consequences of victimisation. The overall aim of this thesis is to explore models of comorbidity between victimisation and alcohol-misuse. Results from Chapters 5 and 6 have provided cross-sectional evidence to suggest that victimisation is associated with a cognitive fear hypervigilance as well as increased neural activation within cognitive and emotional brain regions to social cues; these activation patterns have been associated with emotional symptoms and negative emotional impact. Results from this Chapter have provided evidence to suggest that negative emotional impact is important both in neural response to social cues, but also in creating a risk for increased alcohol consumption in victims of bullying. Further research is required to examine how these cognitive and neural responses may be directly related to avoidant behavioural coping strategies: specifically the use of alcohol.

## **Chapter 7: EFFECTS OF A PERSONALITY-TARGETED INTERVENTION ON VICTIMISATION FROM BULLYING**

### **7.1 Abstract**

**Objective:** To assess the effect of personality-targeted interventions on levels of adolescent bullying victimisation and coping strategies over an 18-month period.

**Method:** Two independent intervention trials (Preventure and Adventure) were used to assess and replicate the effect of personality-targeted interventions on levels of bullying victimisation over an 18-month period. ‘High personality risk’ participants (Preventure: n=292 and Adventure: n=1089), aged 13 to 15 were surveyed during class time at 4 time points over an 18-month period. Participants were randomly assigned (either individually or by school) to intervention or control conditions.

**Results:** The initial study (Preventure) showed an intervention by personality interaction on coping skills and victimisation over 18-months. In the ‘anxiety-sensitivity’ group only, the intervention increased positive coping skills over a 6-month period. The second study (Adventure) showed a main effect of intervention on victimisation over 18-months.

**Conclusions:** Evidence from these two independent trials strongly suggests that personality-targeted coping skills interventions may prevent against school-based victimisation. Future research should further explore these results by targeting personality-specific vulnerabilities to prevent against the adverse consequences of victimisation.

## **7.2 Introduction**

The previous empirical Chapters have provided evidence to suggest that emotional symptoms are important both in conferring risk for victimisation, as well as being an adverse consequence of victimisation; indicative of a change in social information processing. This adaptation to how victims cope with their negative emotions and approach social situations can be targeted within intervention programmes. The current study will analyse the effects of a school-based personality-targeted intervention, to assess whether this programme, which focuses on personality relevant coping skills, can help to reduce levels of bullying victimisation over an 18-month period.

Victims have been shown within the literature to be a heterogeneous group, differing both in their individual characteristics as well as in their reactions to bullying. For example, neurotic personality characteristics have been shown to augur risk for victimisation (Tani et al., 2003; Bollmer et al., 2006), potentially due to the association between victimisation and difficulties in regulating negative emotions (e.g. Shields & Cicchetti, 2001). The manner in which victims respond to bullying helps to determine risk for future victimisation (Schwartz, 2000; Espelage et al., 2001). In a sample of 12 to 13 year olds (N=573), participants rated victims' responses to being bullied. For females, a continuation in victimisation was predicted by displays of helplessness, whilst the inverse (i.e. a lack of helplessness) predicted a reduction in victimisation (Salmivalli et al, 1996).

Interventions which target individual differences and personality characteristics of victims may help victims to better regulate their emotions and thereby minimise the risk for future victimisation (e.g. Frey et al., 2005; 2009). However, current school-based interventions are rarely targeted, and tend to favour a whole-school approach to intervention. The most widely implemented intervention to date remains the Olweus Bullying Prevention Program (Olweus, 1991). This is a whole-school intervention model which aims to reduce and prevent against bullying problems whilst improving school-based peer relations; reductions of over 50 percent have been achieved in both victimisation and bullying perpetration levels (Olweus, 2005). This model has however suffered from inconsistent replication

attempts, a factor which seems to be heavily affected by programme implementation (e.g. Pepler et al., 1994; Ortega & Lera, 2000; Roland, 2000).

A recent meta-analysis conducted by Ttofi and Farrington (2011) showed that whole school models for intervention successfully reduced bullying perpetration, but did not significantly reduce rates of bullying victimisation. In a further meta-analysis of 42 published intervention studies, with a combined sample of 34,713, a larger effect size for reducing bullying behaviours was shown for 'higher risk' students (Ferguson et al., 2007). Accordingly, intervention programmes may benefit from targeting individual characteristics.

Whilst specific characteristics have been implicated in risk (e.g. Pepler et al., 1998; Karatzias et al., 2002; Bollmer et al., 2006; Ball et al., 2008), few bullying intervention trials are targeted towards these risk factors. A recent intervention trial which targeted victims in grades 7-10 who were suffering from anxiety (N=46), showed no direct effect on decreasing victimisation levels. However, this programme which focused on improving anxiety management and coping skills, did successfully increase victims' resilience against future victimisation (e.g. Berry & Hunt, 2009).

Ttofi and Farrington (2011) conclude their recent meta-analysis with a call for further research into bullying interventions. Whilst the whole-school approach does include many beneficial elements, these studies are sensitive to differences in implementation strategies and seem to differ depending on the schools and country in which the programme is trialled. Further, in attempting to capture the entire school population, these programmes are at risk for delivering a generic strategy that does not capture the specific needs of those most vulnerable for victimisation.

The Preventure and Adventure trials administered targeted interventions for 'high-risk' students categorised by their personality characteristics. These trials have proven to be successful in reducing personality specific risky behaviours or mental health outcomes (Castellanos & Conrod, 2006; Conrod et al., 2008; O'Leary-Barrett et al., submitted

manuscript). Importantly, this personality-targeted approach seems to address the replication difficulty seen for previously published anti-bullying trials. The Preventure project has achieved positive prevention effects against the growth of alcohol and substance misuse, within both the UK and North America (Conrod et al., 2006; Conrod et al., 2008; Conrod et al., 2010). Further, Preventure's effects on alcohol-misuse and mental health outcomes have been replicated within the Adventure trial, which utilises a differential model for implementation (O'Leary-Barrett et al., 2010; O'Leary-Barrett et al., submitted manuscript).

### *7.2.1 Aims and Hypotheses*

Accordingly the first aim of this study is to assess the effects of two personality-targeted intervention trials (Preventure and Adventure) on rates of victimisation over an 18-month period. The second aim of this chapter is to investigate how these personality-targeted interventions might influence the reduction of victimisation levels, by analysing the role of positive and avoidant coping strategies. Neuroticism is a personality domain which has been associated with increased risk for victimisation. Subsequently, it is hypothesised that these targeted interventions which focus upon improving personality-specific coping-skills will decrease rates of self-reported victimisation for participants scoring high on 'hopelessness' and 'anxiety-sensitivity' (two lower-order personality domains which are derived from the broader neuroticism domain). Secondly it is hypothesised that the interventions will work to enhance positive coping and to decrease avoidant coping strategies within the 'anxiety-sensitive' and 'hopelessness' groups, thereby helping to explain any reduction in victimisation.

## **7.3 Method**

### *7.3.1 Study 1: Preventure Study*

#### *7.3.1.1 Participants*

Adolescents (N=292; 67%=female) were recruited from 9 secondary schools across London, UK to take part in this study, which forms part of a study entitled Preventure



(mean baseline age=14.00, sd=.70). Whilst the full Preventure study recruited students from 24 secondary schools, coping-skills data were only available from the 9 schools included within the current study. Students attending years 9 to 11 were surveyed and followed up over a 24-month period. This chapter will report data collected from the first four time points: baseline, 6, 12 and 18-months. The follow-up rate achieved for this sample of participants from the Preventure study was 83.2% at six months, 64.4% at 12-months and 64.1% at 18-months (90.1% of participants were surveyed at least twice).

#### *7.3.1.2 Procedure*

The same procedure was followed as described within Chapter 2 of this thesis. A short description will be included below. All students from participating year groups were initially assessed during class time. Those students who scored one standard deviation or more above their school mean on one of the 4 subscales of the 'Substance-Use Risk Personality Scale' (SURPS: hopelessness, anxiety-sensitivity, impulsivity and sensation-seeking, Woicik et al., 2009), were classified as having 'high personality risk' and were invited to take part in the follow-up stage of the study. Within each school, *participants* were then randomly divided into two groups: intervention and non-intervention control (intervention condition: n=167; control condition: n=125).

Four different intervention workshops were conducted within each school; one for each of the four personality 'risk' domains. Students who were randomised to the intervention condition were included within the personality-targeted workshop for which they scored highest; i.e. those students who scored high for 'anxiety-sensitivity' were included in the anxiety-sensitivity-targeted CBT workshop. If a student scored high on more than one subscale, they were assigned to the personality group for which they showed the most statistical deviance according to z-scores. The interventions occurred soon after the initial baseline assessment.

### **7.3.2 Study 2: Adventure Study**

#### **7.3.2.1 Participants**

A replication study was conducted using data collected for the Adventure study: a follow-on study to Preventure, which trained school-staff to administer the same personality-targeted interventions. Adolescents ( $n=1089$ ; 55.1%=male) were recruited from 18 secondary schools across London, UK to take part in this study (mean baseline age=13.71,  $SD=.36$ ). This study differed somewhat from Preventure in its design. Adventure followed a cluster-randomised design, whereby *schools* were randomly selected and assigned to either a non-intervention control condition (7 schools,  $n=464$ ) or an intervention condition (11 schools,  $n=625$ ). Students attending years 9 to 11 were surveyed and followed up over a 24-month period. This chapter will report on data collected from the first four time points: baseline, 6, 12 and 18-months. The follow-up rate achieved for this sample of participants from the Adventure study was 86.8% at six months, 87.6% at 12-months and 79.7% at 18-months (94.7% of participants were surveyed at least twice).

#### **7.3.2.2 Procedure**

The same procedure was followed as described within Chapter 2 of this thesis. A short description will be included below. All students from participating year groups were initially surveyed during class time. In an identical procedure to the Preventure study, all participants completed the SURPS at baseline and were categorised as being either low or high personality risk; high personality risk participants were identified as those who scored one standard deviation or more above their school mean on one of the 4 subscales. All ‘high personality risk’ participants within the *schools* randomised to the intervention condition were invited to take part in the intervention workshops. For the purpose of these analyses, ‘high personality risk’ participants within non-intervention control schools will form the comparison ‘control’ group.

#### **7.3.3 Follow-up Assessments**

Follow-up assessments followed the same procedure as baseline for both studies and were conducted by research assistants who were blind to participants’ (with respect to Preventure) or the school’s (with respect to Adventure) treatment condition. Follow-up

assessments were completed by students during class time every six months for two years post baseline.

#### *7.3.4 Intervention Workshops*

The brief intervention sessions involved two 90-minute group sessions that were conducted at participants' schools by chartered counselling psychologists or experienced special needs teachers, as well as co-facilitators. For a detailed description of the intervention programme, please refer to Chapter 2, section 2.1.8.

#### *7.3.5 Measures*

The following measures were administered in both the Preventure and Adventure studies at all four time points: baseline, 6, 12 and 18-months. A full description of the instruments used in this thesis is provided in Chapter 2. A summary of the measures used for this Chapter is included below.

##### *7.3.5.1 Demographics*

Using a forced-choice procedure participants were asked to provide information on gender, age, school grade and ethnicity (Stewart & Devine, 2000).

##### *7.3.5.2 Personality Assessment*

Personality was assessed using the Substance-use Risk Profile Scale (SURPS, Conrod & Woicik, 2002; Woicik et al., 2009). The SURPS is a 23-item questionnaire which assesses four personality risk factors for substance use: 'hopelessness', 'anxiety-sensitivity', sensation seeking, and impulsivity. Baseline scores of 'anxiety-sensitivity' and 'hopelessness' will be used for the current analyses, with the 'impulsivity' and 'sensation seeking' domains included for comparison purposes. The 'anxiety-sensitivity' subscale was measured using five items (e.g. It's frightening when I feel dizzy or faint; I get scared when I experience unusual body sensations). The 'hopelessness' subscale was measured using seven items (e.g. I am content or satisfied with life in general; I feel proud of my accomplishments). For each item within both subscales, participants indicated on a four

point scale the extent to which they agreed with the statements about themselves (1='strongly disagree'; to 4='strongly agree').

#### *7.3.5.3 Bullying Victimisation*

Adolescent victimisation from bullying was assessed using a 'bullying questionnaire' measure amended from questions used in the large international study entitled: Health Behaviour in School-aged Children (HBSC) study (see Currie et al., 2008), which were taken from the Revised Olweus Bully/Victim Scale (Olweus, 1996).

As described in detail in Chapter 2, the questionnaire consisted of three-items covering three types of victimisation (verbal, relational and physical bullying). For each item participants indicated on a five point scale (1=never, to 5=several times a week) how often they had experienced that type of victimisation within the past six months. The victimisation items were combined to create a composite 'frequency of victimisation' variable.

#### *7.3.5.4 Coping Strategies*

Positive and avoidant coping strategies were measured within the Preventure sample using items taken from the COPE questionnaire (Carver et al., 1989). Positive coping was assessed using 14 items that measured strategies such as active coping; planning; seeking social support; positive reinforcement; acceptance; and religion. Avoidance coping was assessed using 8 items that measured strategies such as denial, behavioural disengagement, mental disengagement and alcohol disengagement. For each item participants are asked to indicate on a four-point scale the extent to which they had engaged in each behaviour in order to deal with their problems over the past six months (1='I haven't been doing this at all', to 4='I have been doing this a lot').

### **7.4 Data Analyses**

All statistical tests for this chapter were conducted using the Statistical Package for the Social Sciences (SPSS, 2004). Statistical significance was set at the conventional level of

$p \leq .05$ . Data was imputed for participants who were not followed up, using the full information maximum likelihood estimation method (SPSS v.15) based on completed baseline datasets for both samples separately. Logistic regression analyses showed that for the Preventure study, younger participants were more likely to drop-out at six months ( $B = .93$ ,  $p < .001$ ), whilst male participants were more likely to drop-out at 12-months. For the Adventure sample, female participants were more likely to drop out at six months ( $B = .65$ ,  $p < .001$ ), and older participants were more likely to drop out at 18-months ( $B = -.43$ ,  $p < .05$ ). There were no significant predictors for attrition at 12-months. Within both sets of analyses, victimisation scores were log transformed to correct for positive skew.

The Adventure study followed a cluster-randomised design (clustered by school). The statistical programme HLM-6 was utilised in order to assess the impact of clustering upon the data. Accounting for school clusters is not deemed to be necessary if unconditional models reveal that less than 10% of systematic variance exists at the between school level (Lee, 2000). Analyses revealed that 4% of the variance in victimisation was accounted for by intra-cluster correlations. As such all further analyses did not control for cluster and were conducted using SPSS v.15. To assess the effect of the interventions, repeated measures analyses of covariance (ANCOVA) were conducted, investigating interactions between time, personality group and intervention group status. Gender, ethnicity, and baseline scores were held as covariates. Due to a greater degree of variance in this variable, age was included as a further covariate within the Preventure analyses. Effect sizes for repeated measures were calculated in SPSS using Partial Eta-squared ( $\eta_p^2$ ) (small effect = .01; moderate effect = .09 and large effect = .25). Cohen's  $d$  effect size was calculated for results showing time specific effects (small effect = .20; moderate effect = .50; large effect = .80).

## **7.5 Results**

### **7.5.1 Study One: Preventure Sample**

#### *7.5.1.1 Intervention Effects for Victimisation*

Table 7.1 shows the means and standard deviations for victimisation at each of the four time points: baseline, 6, 12 and 18-months. Descriptive statistics are included for the total

sample, for each of the four personality domains, as well as for the intervention and non-intervention control groups. Independent samples t-tests were conducted which showed that the intervention and non-intervention control groups were matched at baseline for victimisation scores within the ‘anxiety-sensitivity’, ‘hopelessness’ and ‘sensation seeking’ personality domains ( $p=.34$ ;  $p=.11$ ;  $p=.50$ , respectively). The control group for the ‘impulsivity’ domain reported significantly higher levels baseline levels of victimisation in comparison to the intervention group,  $t(34.78)=-2.26$ ,  $p<.05$ . An analysis of the mean scores was conducted using repeated measures ANCOVA with intervention status and personality risk group as the between-subject factors. Self reported victimisation levels over time at 6, 12 and 18-months were included as the within-subjects factors. Controlling for baseline scores, results showed a significant main two-way ‘intervention by personality’ group interaction,  $F(3,280)=4.77$ ,  $p<0.01$ .

This interaction was further analysed and interpreted by holding personality group constant. Repeated measures ANCOVA analysed separately for each personality domain, showed a significant main effect of intervention within the ‘anxiety-sensitivity’ group,  $F(1,73)=18.19$ ,  $p<.001$  ( $\eta_p^2=.20$ ), with the intervention group showing lower levels of victimisation across the 18-month period in comparison to the non-intervention control group. Additionally, a trend for a two-way ‘time by intervention’ multivariate interaction was shown within the ‘anxiety-sensitivity’ group,  $F(2, 72)=2.8$ ,  $p=.067$ , indicating that the intervention was effective in reducing victimisation across the 18 month period, but that this effect was strongest at 6 and 12 months.

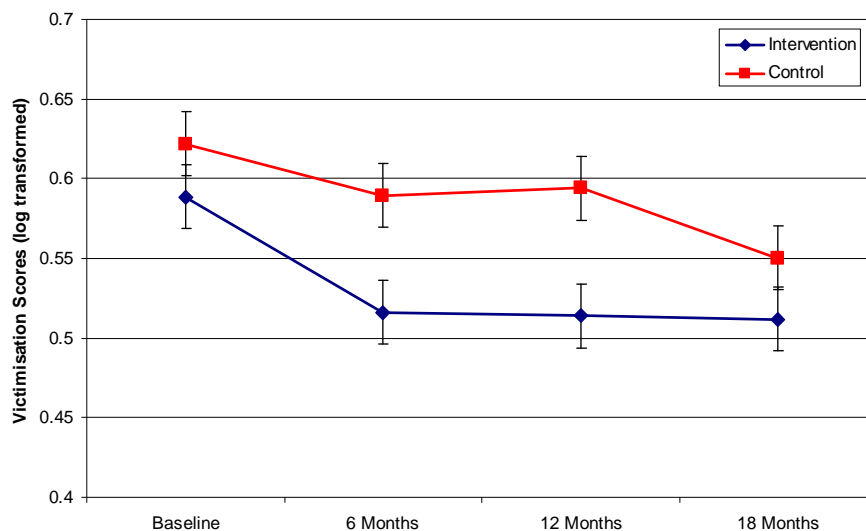
Univariate ANCOVAs (controlling for the effects of ethnicity, age and gender) were conducted to assess the difference within the ‘anxiety-sensitivity’ personality group domain between the intervention and non-intervention control groups across each of the four time points (see Figure 7.1). The intervention and non-intervention control groups were matched at baseline for victimisation scores ( $p=.39$ ). Significant between groups differences were shown for victimisation reported at all subsequent time points (six months:  $F(1,73)=10.83$ ,  $p<.01$ ; 12-months:  $F(1,73)=10.46$ ,  $p<.01$ ; 18-months:  $F(1,73)=6.81$ ,  $p<.05$ ), with the intervention group reporting lower levels of victimisation. There were no

significant effects of intervention for the hopelessness, impulsivity or sensation seeking personality groups ( $p=.11$ ;  $p=.32$ ;  $p=.93$ , respectively), therefore no further analyses were conducted for these personality groups.

**Table 7.1 Mean victimisation scores: the Preventure study**

		Baseline	6-Months	12-Months	18-Months
<b>Whole Sample</b>	<i>Control (n=125)</i>	4.57 (1.85)	4.03 (1.86)	3.88 (1.46)	3.64 (1.17)
	<i>Intervention (n=167)</i>	4.09 (2.33)	3.85 (1.73)	3.66 (1.50)	3.42 (.90)
<b>Anxiety-Sensitivity</b>	<i>Control (n=37)</i>	4.54 (2.10)	4.14 (1.47)	4.12 (1.51)	3.63 (.73)
	<i>Intervention (n=42)</i>	4.18 (1.94)	3.30 (.64)	3.33 (.59)	3.26 (.46)
<b>Hopelessness</b>	<i>Control (n=28)</i>	5.59 (3.21)	4.20 (1.52)	3.48 (1.09)	3.66 (1.14)
	<i>Intervention (n=40)</i>	4.47 (1.91)	4.49 (2.06)	4.19 (2.19)	3.89 (1.36)
<b>Impulsivity</b>	<i>Control (n=22)</i>	5.32 (2.36)	4.71 (3.11)	4.37 (1.81)	3.79 (1.30)
	<i>Intervention (n=37)</i>	4.05 (1.65)	3.87 (1.69)	3.55 (1.30)	3.34 (.72)
<b>Sensation-Seeking</b>	<i>Control (n=38)</i>	3.41 (.87)	3.40 (1.24)	3.64 (1.33)	3.53 (1.46)
	<i>Intervention (n=48)</i>	3.71 (1.86)	3.79 (1.98)	3.59 (1.42)	3.22 (.70)

NB: Standard deviations are shown in parentheses; these mean values do not control for baseline scores



**Figure 7.1 Effect of the intervention on victimisation scores within the ‘anxiety-sensitivity’ group over 18-months, using data from study 1: the Preventure Study**

NB: 1) The figure depicts marginal means, controlling for the effect of baseline victimisation scores. Baseline scores are shown here to help interpretation of results.

2) The intervention workshops were conducted soon after the baseline assessments.

#### *7.5.1.2 Intervention Effects on Coping Strategies*

The previous result showed that the intervention successfully reduced levels of victimisation only for the ‘anxiety-sensitivity’ personality group. In order to try to understand the mechanisms underlying this positive intervention effect, the effect of the intervention was assessed for its impact upon positive and avoidant coping strategies, specifically within the ‘anxiety-sensitivity’ group. Tables 7.2 and 7.3 show the means and standard deviations for positive and avoidant coping strategies, over an 18-month period. Using these mean scores, a 2x3 repeated measures ANCOVA was conducted with coping style (positive or avoidant) and time (6, 12 and 18-months) as the within-subjects factors, and intervention status as the between-subjects factor. Results showed a significant three-way time by intervention by coping-style multivariate interaction,  $F(2, 66)=3.30, p<.05$ .

The previous analyses suggested a differential effect of the intervention depending on type of coping strategy (i.e. positive or avoidant strategies). As such, this effect of the interaction was explored further by holding coping style constant and repeating the model separately for positive and avoidant coping strategies. Results showed no significant main effect of intervention ( $p=.49$ ). A significant two-way interaction of ‘time by intervention’ on positive coping-skills was shown,  $F(2,136)=4.86, p<.01$  ( $\eta_p^2=.07$ ) (see Figure 7.2), indicating that the intervention was effective in increasing positive coping skills only at 6 months. Univariate ANCOVAs were conducted to assess the between group differences for positive coping at each of the four time-points (controlling for the effect of gender, age and ethnicity). Results showed that the intervention and non-intervention control groups were matched at baseline ( $p=.95$ ). The intervention group showed significantly greater positive coping-skills at six months,  $F(1,69)=6.30, p<.05$  (Cohen’s  $d=.50$ ). The intervention and control groups did not significantly differ at either 12 or 18-months ( $p=.26$  and  $p=.32$ , respectively).



**Table 7.2 Mean positive coping scores: the Preventure study**

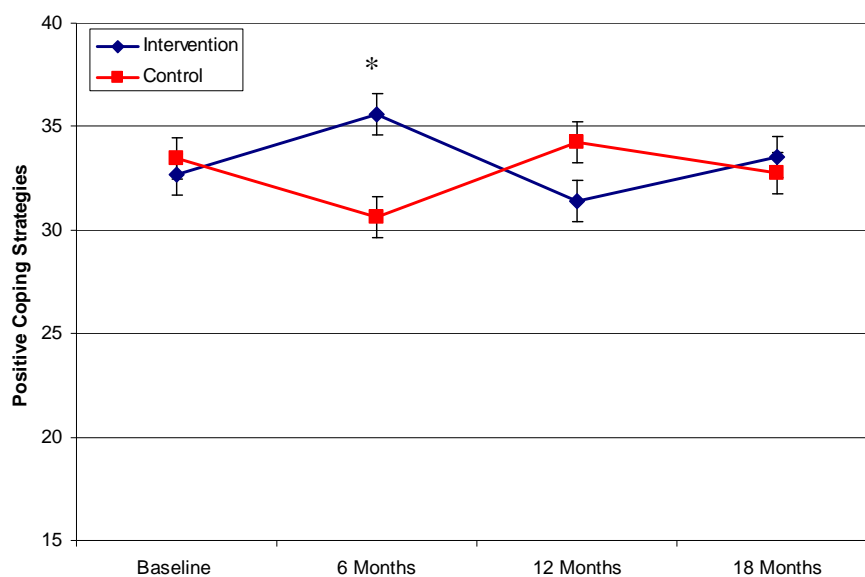
		Baseline	6-Months	12-Months	18-Months
<b>Whole Sample</b>	<i>Control</i>	30.53 (9.18)	29.74 (8.84)	31.17 (8.65)	30.01 (8.57)
	<i>Intervention</i>	29.17 (8.28)	31.68 (8.67)	28.86 (8.98)	31.10 (10.00)
<b>Anxiety-Sensitivity</b>	<i>Control</i>	33.43 (8.94)	30.91 (8.24)	34.42 (7.84)	32.88 (7.79)
	<i>Intervention</i>	32.73 (10.03)	35.38 (9.46)	31.24 (10.17)	33.42 (10.86)

NB: Standard deviations are shown in parentheses; these mean values do not control for baseline scores

**Table 7.3 Mean avoidant coping scores: the Preventure study**

		Baseline	6-Months	12-Months	18-Months
<b>Whole Sample</b>	<i>Control</i>	14.43 (4.84)	14.03 (4.33)	14.51 (4.45)	13.94 (4.42)
	<i>Intervention</i>	13.68 (3.78)	14.59 (4.00)	13.84 (3.89)	14.02 (4.27)
<b>Anxiety-Sensitivity</b>	<i>Control</i>	14.00 (3.72)	13.49 (4.18)	14.64 (3.70)	13.93 (4.19)
	<i>Intervention</i>	14.10 (4.29)	14.73 (4.11)	13.45 (4.14)	14.58 (4.63)

NB: Standard deviations are shown in parentheses; these mean values do not control for baseline scores



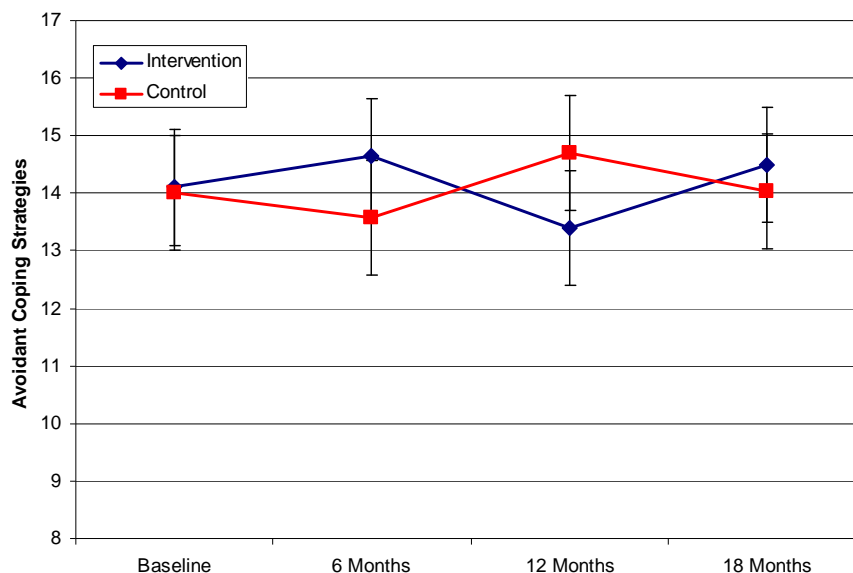
**Figure 7.2 Effect of the intervention on positive coping scores within the ‘anxiety-sensitivity’ group over 18-months, using data from study 1: the Preventure Study**

\* $p < .05$

NB: 1) 5 additional participants were excluded from the coping analyses due to nonsensical reporting  
 2) The figure depicts marginal means. Analyses controlled for the effects of positive coping strategies at baseline; baseline scores are shown here to help interpretation of results.

3) The intervention programmes were conducted soon after the baseline assessments.

Finally, a repeated measures ANCOVA was conducted to assess the impact of the intervention on avoidant coping strategies over the 18-month period. No significant main effect of intervention was shown ( $p=.89$ ). Results showed a significant two-way ‘time by intervention’ interaction,  $F(2,136)=3.53$ ,  $p<.05$  (see Figure 7.3), suggesting that the intervention was effective in reducing avoidant coping strategies at 12 months. Similarly to the previous analyses, univariate ANCOVAs were conducted to assess the between group differences at each of the four time-points. The intervention and control groups were not shown to significantly differ for avoidant coping at any time-point ( $p=.66$ ;  $p=.12$ ;  $p=.33$ ,  $p=.26$  respectively).



**Figure 7.3 Effect of the intervention on avoidant coping strategy within the ‘anxiety-sensitivity’ group over 18-months, using data from study 1: the Preventure Study**

\* $p<.05$ ,

NB: 1) 5 additional participants were excluded from the coping analyses due to nonsensical reporting

2) The figure depicts marginal means. Analyses controlled for the effects of avoidant coping strategies at baseline; baseline scores are shown here to help interpretation of results.

3) The intervention programmes were conducted soon after the baseline assessments.

### *7.5.2 Replication Analysis: The Adventure Study*

#### *7.5.2.1 Intervention Effects for Victimisation*

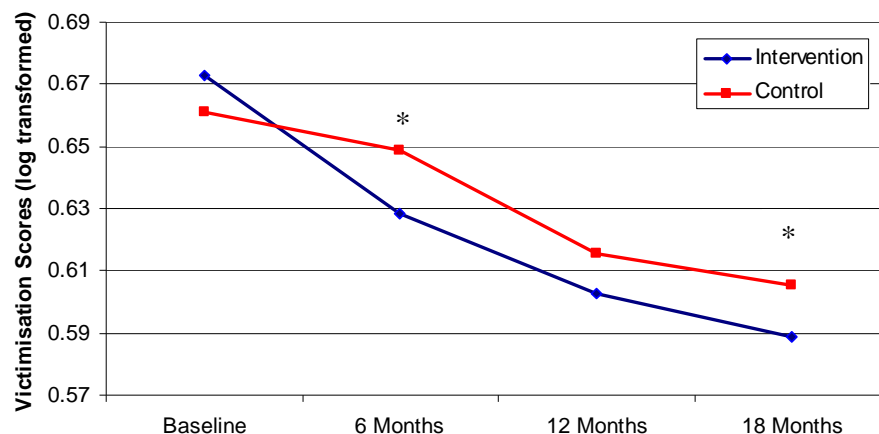
Table 7.4 shows the means and standard deviations for victimisation at each of the four time points: baseline, 6, 12 and 18-months. Descriptive statistics are included for the total sample, for each of the four personality domains, as well as for the intervention and non-intervention control groups. Independent samples t-tests were conducted which showed that the intervention and non-intervention control groups were matched at baseline for victimisation scores within each personality domain ('anxiety-sensitivity':  $p=.13$ ; 'hopelessness':  $p=.87$ ; 'sensation seeking':  $p=.34$ ; 'impulsivity':  $p=.87$ ). An analysis of the mean scores was conducted using repeated measures ANCOVA with intervention status and personality risk group as the between-subject factors. Self reported victimisation levels over time at 6, 12 and 18-months were included as the within-subjects factors. Results showed a main effect of intervention status,  $F(1,1078)=6.54$ ,  $p<.05$  ( $\eta_p^2=.01$ ), with the intervention group showing lower levels of victimisation. No significant effects of personality group were shown ( $p=.10$ ).

Whilst, no specific effect of time was shown with regards to the intervention ( $p=.97$ ), univariate ANCOVAs were conducted to further explore time effects across the whole sample (see Figure 7.4). Results showed that the intervention and control groups were matched for victimisation scores at baseline ( $p=.30$ ). Univariate ANCOVAs at each of the follow-up time-points controlled for the effect of gender, age, ethnicity and baseline victimisation scores. The intervention group reported significantly lower levels of victimisation at both 6 and 18 months (6 months:  $F(1, 1084)=5.83$ ,  $p<.01$ ; 18 months:  $F(1, 1084)=3.71$ ,  $p<.05$ ). The intervention group also scored lower than the control group at 12 months, although this result did not reach significance ( $p=.08$ ). A final paired-samples t-test was conducted to assess the degree of change from baseline to 18 months within the intervention and control groups separately. Results showed that victimisation scores decreased significantly for both groups (control:  $t(463)=6.88$ ,  $p<.001$ ; intervention:  $t(624)=11.25$ ,  $p<.001$ ), but that the effect was larger for the intervention group (effect size for difference in reduction of victimisation: Cohen's  $d=0.14$ ).

**Table 7.4 Means victimisation scores: the Adventure study**

		Baseline	6-Months	12-Months	18-Months
<b>Whole Sample</b>	<i>Control (n=464)</i>	4.75 (2.12)	4.63 (2.14)	4.38 (1.99)	4.25 (1.94)
	<i>Intervention (n=625)</i>	5.04 (2.62)	4.65 (2.43)	4.38 (2.21)	4.16 (1.91)
<b>Anxiety-Sensitivity</b>	<i>Control (n=127)</i>	4.65 (1.89)	4.52 (1.66)	4.28 (1.88)	4.01 (1.65)
	<i>Intervention (n=176)</i>	5.22 (2.60)	4.74 (2.51)	4.69 (2.53)	4.04 (1.42)
<b>Hopelessness</b>	<i>Control (n=110)</i>	5.54 (2.84)	5.06 (2.42)	4.35 (1.73)	4.31 (2.22)
	<i>Intervention (n=147)</i>	5.73 (3.33)	5.24 (2.91)	4.48 (2.05)	4.42 (2.39)
<b>Impulsivity</b>	<i>Control (n=115)</i>	4.52 (1.70)	4.52 (2.34)	4.71 (2.36)	4.42 (1.99)
	<i>Intervention (n=145)</i>	4.86 (2.43)	4.64 (2.35)	4.13 (1.75)	4.26 (2.03)
<b>Sensation-Seeking</b>	<i>Control (n=112)</i>	4.22 (1.59)	4.40 (2.10)	4.20 (1.96)	4.29 (1.89)
	<i>Intervention (n=157)</i>	4.30 (1.66)	3.98 (1.59)	4.11 (2.27)	3.96 (1.76)

NB: Standard deviations are shown in parentheses; these mean values do not control for baseline scores



**Figure 7.4 Effect of the intervention on victimisation scores within the whole sample over 18 months using data from study 2: the Adventure Study**

\* $p < .05$

NB: 1) The figure depicts marginal means, which controlled for baseline victimisation scores. Baseline scores are shown here to help interpretation of results.

2) The intervention programmes were conducted soon after the baseline assessments.

## **7.6 Discussion**

The previous empirical Chapters within this thesis have implicated risk factors for bullying victimisation (i.e. emotional symptoms and neurotic personality), which have previously been implicated in the risk for alcohol-misuse. Accordingly, this Chapter aimed to assess the secondary effects of a personality-targeted intervention, which is primarily targeted towards risky behaviours (including alcohol-misuse), on rates of self-reported victimisation over an 18-month period. This is the first study of its kind to administer separate interventions for victimisation which were targeted towards adolescents' personality characteristics, rather than their role in bullying. Data from an independent intervention trial were analysed to attempt to replicate findings. Results from the initial study showed a significant positive effect of the intervention within the 'anxiety-sensitivity' personality group. The second study showed a reduction in overall levels of victimisation over time, but no personality specific effects were found.

These results provide evidence to suggest that targeted interventions which focus on personality vulnerabilities can decrease levels of adolescent bullying victimisation over an 18-month period. Results from both the Preventure and Adventure trials show a significant reduction in victimisation within the intervention groups in comparison to control groups over an 18-month period. The results from these studies present important and novel implications for preventing against bullying victimisation, which can lead to serious and even fatal consequences (e.g. Arseneault et al., 2010; Mackie et al., 2010; Klomek et al., 2010).

The initial study which analysed data from the Preventure study showed a personality specific intervention effect within the 'anxiety-sensitivity' group, who showed decreased victimisation levels over the 18-month period. Contrary to hypotheses, no significant effect of receiving an intervention was shown within the 'hopelessness' group. Previous research has highlighted the personality risk posed by neurotic personality domains (see Bollmer et al., 2006; Slee & Rigby, 1993). The lack of an effect shown for the 'hopelessness' group within this study may be indicative of the therapist-led intervention workshops being more pertinent for the anxious, rather than negative thinking facet of neuroticism. Alternatively,

this effect may have been caused by the relatively small group sizes included within this sub-sample from the Preventure trial.

These personality-targeted interventions are focused upon teaching participants coping strategies which are relevant for their personality domain. For example, adolescents who score highly for ‘anxiety-sensitivity’ may be afraid of social groups and therefore choose to cope with this fear through avoidance of social events. Whilst this coping strategy may benefit the individual in the short term by preventing against any social event induced anxiety, in the long term, this strategy serves to enhance their isolation and potentially increase their fear of social settings. Poor coping strategies have been shown within previous studies to be important for the development or continuation of bullying victimisation (Espelage et al., 2001; Schwartz, 2000; Kochenderfer-Ladd and Skinner, 2002; Kochenderfer-Ladd, 2004).

Accordingly, in order to understand how this intervention may be positively affecting levels of victimisation within the ‘anxiety-sensitive’ group, the effects of the intervention on positive and avoidant coping strategies were assessed. The ‘anxiety-sensitivity’ targeted intervention was shown to significantly enhance positive coping-skills, including active coping; acceptance; and seeking social support, over a six month period. Whilst the intervention worked to enhance active positive coping skills, no significant effect was shown for avoidance coping. This result suggests that these brief personality-targeted workshops are able to enhance participants’ positive coping skills over a six month period, which subsequently diminishes participants’ risk for future interpersonal conflict.

This result which is specific for the ‘anxiety-sensitive’ intervention group, supports results from the only published intervention study to date which targeted anxious victims of bullying (Berry & Hunt, 2009). The results from the current study mirror Berry and Hunt’s (2009) findings, to suggest that the success of the intervention on enhancing positive coping skills, rather than in decreasing avoidance coping, may be due to the strong psychoeducational component included within the programme. This component aims to

teach anxious participants strategies that they can use to cope positively with adverse social experiences.

The Preventure trial ran costly therapist delivered interventions, and due to opt-in consent procedures, relatively small groups were available for these analyses. As such, the same hypotheses were tested using data from the Adventure trial, which had a larger sample to detect effects and involved training school-staff to deliver the prevention programme, thereby enhancing the sustainability of the intervention model. Previous results from Chapter 4 of this thesis, which investigated data collected from the non-intervention control participants within the Adventure trial, showed that ‘anxiety-sensitivity’ and ‘hopelessness’ independently predicted increases in victimisation over an 18-month period. This result was replicated across both the Preventure and Adventure studies, and would suggest that personality-targeted interventions would show personality specific effects. However, the results from this chapter have shown that whilst the Adventure intervention trial had a positive overall effect in decreasing victimisation levels over time, this effect was generalised across all personality groups. This result suggests that administering separate targeted interventions can successfully reduce victimisation, without differentiating between personality groups with respect to efficacy.

Whilst the intervention workshops were limited to those adolescents categorised as high-risk, in contrast to the Preventure study, the Adventure trial implemented a whole-grade approach with respect to the surveys. All assenting adolescents, whether high or low personality risk were followed up over each time point, with some teachers trained to deliver all four interventions. This strategy may have promoted a global increase in awareness and tolerance towards individual differences within the participating year-group, resulting in improved coping-skills and behaviours which are not restricted to a specific group. This strategy is perhaps more in line with previous interventions that have successfully reduced victimisation using a whole-school approach; aiming to reduce victimisation through changes to the school environment (e.g. Olweus, 2005).

Importantly, a previous analysis of the Adventure trial has shown a ‘herd’ effect to exist, such that low-risk students who are enrolled in the intervention schools, but who do not participate in the intervention workshops, show a reduction in alcohol and drug misuse in comparison to their low risk counterparts who were enrolled in control schools (Conrod et al., under review). Information on coping strategies was not available for the Adventure study, therefore, future studies should replicate this trial and investigate whether a potential ‘herd’ effect exists for positive coping skills, which may help to explain the generalised reduction shown for levels of victimisation.

#### *7.6.1 Limitations*

When interpreting these results it is important to take into account a number of potential limitations. Firstly, the Adventure study whilst included within this chapter as a replication study for Preventure, did not utilise an identical design and therefore the samples cannot be identically matched. The intervention programmes, whilst identical in content had different facilitators, with the Preventure trial utilising professional therapists, and the Adventure study training school staff to deliver the programme. Whilst the Adventure trial has shown high programme fidelity (O’Leary-Barrett et al., 2010), the use of teachers may have impacted on levels of victimisation in a manner which is beyond the scope of these analyses.

Whilst the results from the Preventure trial were not fully replicated within the Adventure study, both sets of analyses implicate these personality-targeted interventions in the successful reduction of bullying victimisation levels over time. The opt-in consent procedure led to a smaller sample size for the Preventure trial, which should be taken into consideration when interpreting the results. Additionally, information on coping strategies was not available within the Adventure study. Taking into account the smaller sample size, the intervention effect shown for coping strategies must therefore be replicated before any firm conclusions can be made.

Finally, neither the Preventure nor Adventure trials administered a placebo control condition, which would have methodologically strengthened the study. Both of these



interventions were only evaluated in comparison to control groups who were exposed to general coping skills information through the national school curriculum. Future studies should investigate whether a placebo-controlled trial is necessary in evaluating the efficacy of the intervention with respect to school-based victimisation.

### *7.6.2 Conclusions*

Taking these limitations into consideration, this Chapter has provided evidence to suggest that brief school-based and personality-targeted interventions can help to reduce levels of bullying victimisation. Further, this result has been replicated across two independent samples, which utilised differential implementation techniques. This is an important advance within the victimisation intervention field, as previously successful trials have cited implementation as the reason behind replication failure (e.g. Roland et al., 2000). In order for an intervention to claim broad success, it should be translatable to multiple settings, countries and languages. Outcomes from the Preventure trial for alcohol and substance misuse have already been replicated in both North-American and European contexts (e.g. Conrod et al., 2006; Conrod et al., 2010), providing evidence to support the transferability of this design. The results from these two intervention trials corroborate one-another to suggest that successful school-based victimisation interventions need not be limited to focused ‘anti-bullying’ programmes. Instead, behavioural interventions which target specific risk factors (such as personality vulnerabilities) can successfully and indirectly work to reduce victimisation, whilst simultaneously increasing the feasibility and cost-effectiveness of the intervention model. With respect to the overall aim of this thesis, this study has shown that an intervention which targets personality domains, which have been implicated in the risk for substance-use, can also work to effectively decrease levels of victimisation. This provides evidence in favour of a common mechanism comorbidity model. To explore this further, the following chapter will investigate whether these same interventions can prevent against alcohol-misuse specifically for victims of bullying.

## **Chapter 8: EFFECTS OF A PERSONALITY-TARGETED INTERVENTION IN PREVENTING THE DEVELOPMENT OF COPING-DRINKING MOTIVES AND ALCOHOL-RELATED PROBLEMS FOR VICTIMS OF BULLYING**

### **8.1 Abstract**

**Objective:** To investigate whether personality-targeted coping-skills interventions would be effective in preventing coping-drinking motives and alcohol-related problems for a subgroup of adolescent victims of bullying.

**Method:** ‘High personality risk’ participants (N=564; mean age=13.8) were recruited as part of the Preventure study and were randomised to either an intervention or control condition. Participants were followed up every six months after the intervention over an 18-month period.

**Results:** Results showed a positive intervention effect which was strongest for victims of bullying and less so for non-victims over an 18-month period. Victims within the intervention group showed significantly lower levels of coping-drinking and alcohol-related problems in comparison to victims in the control condition. Independent samples t-tests showed that for victims of bullying, the intervention prevented against alcohol-related problems for the full 18-month period, whilst coping-drinking motives were prevented against for 12-months. Once the effect of the intervention was accounted for in the victim group, there were no significant differences within the non-victim group for either of the two outcome measures.

**Conclusions:** These results show that personality-targeted interventions are especially effective in preventing against a risky style of coping and related drinking problems for victims of adolescent bullying. Wider implications can be made regarding school-based interventions, which should aim through the use of a single, targeted programme, to prevent against a broad range of risky behaviours, specifically within more vulnerable groups of adolescents.

## **8.2 Introduction**

The previous Chapter provided evidence to show that a personality-targeted intervention programme can work to effectively reduce levels of bullying victimisation over an 18-month period. This targeted model for prevention has been previously shown to be successful in reducing alcohol and drug misuse (e.g. Conrod et al., 2008; Conrod et al., 2010; O’Leary-Barrett et al., 2010). With respect to the overall aim of this thesis, the success of this programme in preventing against both alcohol-misuse as well as bullying victimisation suggests that both outcomes are effected by personality. This therefore provides evidence in favour of a common underlying mechanism between victimisation and alcohol-misuse. Accordingly, this chapter will analyse data from the same programme, to assess whether targeting personality vulnerabilities can prevent against alcohol-misuse specifically for victims of bullying.

Various forms of adolescent victimisation (including maltreatment and one-off acts of violence) have been associated with the risk for alcohol-misuse (e.g. Duncan et al., 1996; Kilpatrick et al., 2000), with some studies also showing a relationship between bullying victimisation and increased alcohol consumption (e.g. Sullivan et al., 2006; Tharp-Taylor et al., 2009). Drinking motivations, which have been described as the final common pathway towards alcohol-use and misuse (Cox & Klinger, 1988), can help to explain why vulnerable adolescents may be at increased risk for alcohol-related problems (Cooper, 1994; Cooper, 2005). Individuals who have experienced a traumatic event or victimisation have been shown to consume alcohol due to coping-drinking motives (e.g. Dixon et al., 2009), a style of drinking which is associated with alcohol-related problems (e.g. Kuntsche et al., 2007).

Selected school-based interventions which target higher risk adolescents may achieve greater success in reducing risky behaviours, as they are able to focus on the needs of a more homogeneous group who show similar vulnerabilities (Spath, 2006). Targeted programmes can be tailored to teach higher risk youth adaptive coping strategies, including seeking out external support, developing problem solving abilities, strategies to resist peer pressures and strategies to cope with negative emotions (Botvin et al., 1995; Kimber et al., 2008).

Adolescent victims of bullying are one such vulnerable group who could potentially benefit from interventions which focus on teaching positive coping strategies. However, no known intervention study has specifically targeted alcohol-misuse in victims of bullying. This is possibly due to the paucity of research which investigates the association between bullying victimisation and alcohol-misuse. However, as shown in Chapter 3 of this thesis, victims of bullying are at increased risk for initiating alcohol-use as part of a general maladaptive coping strategy. Accordingly, it is important that targeted interventions be developed which address the unique needs of this group.

The Preventure Project, conducted in the United Kingdom, is an example of a brief personality-targeted intervention programme that utilises cognitive behaviour focused coping skills workshops in order to prevent against and reduce personality specific problem behaviours (see Castellanos & Conrod, 2006; Conrod et al., 2010). This trial targeted adolescents who were classified as being at heightened risk for problematic behaviours associated with their personality domain. For example, the trial has shown to successfully reduce shoplifting rates for adolescents who score highly for impulsivity, whilst binge-drinking rates have been prevented against for adolescents who show high levels of sensation-seeking (Conrod et al., 2008).

### *8.2.1 Aims and Hypotheses*

Chapter 3 of this thesis provided evidence to suggest that bullying victimisation increases the risk for alcohol-related problems, partially explained by the development of coping-drinking motives. Further, Chapter 7 showed that the same personality-targeted interventions aforementioned, are successful in reducing levels of victimisation. Accordingly, it seems that rather than just reducing a specific behaviour or outcome, these interventions work by targeting the personality vulnerabilities that seem to be a common mechanism underlying both victimisation and alcohol-misuse. As such, the aim for this final chapter is to conduct a subgroup analysis of the Preventure trial to assess whether this personality-targeted coping skills intervention, is also able to prevent against the

development of coping-drinking motives and alcohol-related problems amongst victims of adolescents bullying.

## **8.3 Method**

### *8.3.1 Participants*

Adolescents (n=564; 73.2%=female) were recruited from 18 secondary schools across London, UK to take part in this study, which forms part of a study entitled Preventure (mean age=13.85, sd=0.75). Whilst the full Preventure study recruited students from 24 secondary schools, baseline data on bullying victimisation were only available from the 18 schools included within the current study. Students attending years 9 to 11 were assessed and followed up over a 24-month period. This chapter will report data collected from the first four time points: baseline, 6, 12 and 18-months. The follow-up rate achieved for this sample of participants from the Preventure study was 83.5% at six months, 72.2% at 12-months and 61.2% at 18-months (92% of participants were surveyed twice and 77.5% of students were surveyed at least 3 times).

### *8.3.2 Procedure*

The same procedure was followed as described within Chapters 2 and 7 of this thesis. A short description will be included below. All students from participating year groups were initially assessed during class time by trained research assistants, with school teachers present. High personality risk students (identified using the 'Substance-Use Risk Personality Scale' (SURPS, Woicik et al., 2009), were invited to take part in the follow-up stage of the study. Within each school, *participants* were then randomly divided into two groups: intervention and non-intervention control (304=intervention; 260=control) (see Table 8.1 for a breakdown of group numbers). Students who were randomised to the intervention condition were included within the personality-targeted workshop for which they scored highest. The interventions occurred soon after the initial baseline assessment.

### *8.3.3 Intervention Workshops*

The brief intervention sessions involved two 90-minute group sessions that were conducted at participants' schools by chartered counselling psychologists or experienced special needs teachers, as well as co-facilitators. For a detailed description of the intervention programme, please refer to Chapter 2.

### *8.3.4 Follow-up Assessments*

Follow-up assessments followed the same procedure as baseline and were conducted by research assistants who were blind to participants' treatment condition. Follow-up assessments were completed by students during class time every six months for two years post interventions.

### *8.3.5 Measures*

The following measures were administered at all four time points: baseline, 6, 12 and 18-months. A full description of the instruments used is provided in Chapter 2. A summary of the measures used for this chapter is included below.

#### *8.3.5.1 Demographics*

Using a forced-choice procedure participants were asked to provide information on gender, age, school grade and ethnicity (Stewart & Devine, 2000).

#### *8.3.5.2 Bullying Victimization*

Adolescent victimisation from bullying was assessed using a 'bullying questionnaire' measure amended from questions used in the large international study entitled: Health Behaviour in School-aged Children (HBSC) study (see Currie et al., 2008), which were taken from the Revised Olweus Bully/Victim Scale (Olweus, 1996).

As described in detail in Chapter 2, the questionnaire consisted of three-items which detailed three types of victimisation (verbal, relational and physical bullying). More severe victims were identified as those who had experienced one or more type of bullying at least two or three times per month in the past six months. Within the current study, these

participants will be classified as ‘victims’. All other participants will be classified as ‘non-victims’.

#### *8.3.5.3 Coping-Drinking Motives*

Participants who positively responded to consuming alcohol in the past six months answered the ‘Drinking Motives Questionnaire’ (DMQ, Cooper, 1994). (Students who had not drunk alcohol within the past six months answered ‘never’ for all questions within this measure). The DMQ consists of 20 items to measure motives for drinking across 4 dimensions: enhancement, social, conformity and coping. Students were asked to report how often they drank alcohol for the different motives on a 5 point scale (1=never to 5=always). This study utilised the subscale for coping motives (e.g. to forget my worries; to cheer up when I am in a bad mood; because it helps when I am depressed or nervous). Higher scores on this scale are indicative of higher levels of coping drinking.

#### *8.3.5.4 Alcohol-Related Problems*

Participants who positively responded to consuming alcohol in the past six months answered an amended version of the RAPI (White & Labouvie, 1989). Students who had not drunk alcohol within the past six months answered ‘never’ for all questions within this measure. For each of the 7 items, respondents indicated on a 5 point scale (1=never, to 5=more than 6 times) how many times they have experienced negative consequences due to their alcohol-use in the past six months (e.g. got into fights; noticed a change in my personality). Responses were summed across the 7 items to yield a composite score accounting for problem frequency.

### **8.4 Data Analyses**

Data was imputed for participants who were not followed up, using the full information maximum likelihood estimation method (SPSS v.15) based on completed baseline datasets. Logistic regression analyses showed that male participants were up to 2.8 times more likely to drop out at 6, 12 and 18-months. Scores for alcohol-related problems and coping-drinking motives were log transformed to correct for positive skew.

To evaluate the effect of the targeted interventions on alcohol-related problems and coping-drinking motives over an 18-month period, separate repeated measures analyses of covariance (ANCOVA) were conducted, investigating interactions between time, victimisation status (i.e. victim or non-victim) and intervention group status. Gender, ethnicity, age and baseline victimisation were held as covariates. Baseline alcohol-related problems and coping-drinking motive scores were controlled for within the corresponding analyses. Any significant interactions were further investigated using independent samples t-tests. Cohen's d effect size was calculated for time specific effects (small effect=.20; moderate effect=.50; large effect=.80).

## 8.5 Results

### 8.5.1 Intervention effects on coping motives for drinking

Table 8.1 shows a breakdown of the group frequencies included within the current analyses.

**Table 8.1 Composition of sample for analyses**

	Intervention	Control	Total
Victims	43	50	93
Non-Victims	261	210	471
Total	304	260	

Table 8.2 shows the means and standard deviations for coping-drinking motive scores at each of the 4 time points: baseline, 6, 12 and 18-months. These descriptive statistics are presented for the total sample, as well as for the 4 overlapping groups included within these analyses: the intervention and non-intervention control groups, as well as the victims of bullying and non-victims. An analysis of these scores was conducted using repeated measures ANCOVA with both intervention and victimisation status as the between-subject factors. Self reported coping motive scores over time at 6, 12 and 18-months were the between-subjects factors. Results showed a significant main effect of intervention status [ $F(1,553)=8.52$ ,  $p<0.01$ ], as well as a significant main 2-way intervention by victim group interaction [ $F(1, 553)=10.93$ ,  $p<.01$ ] (see Figure 8.1). These results suggest that whilst the

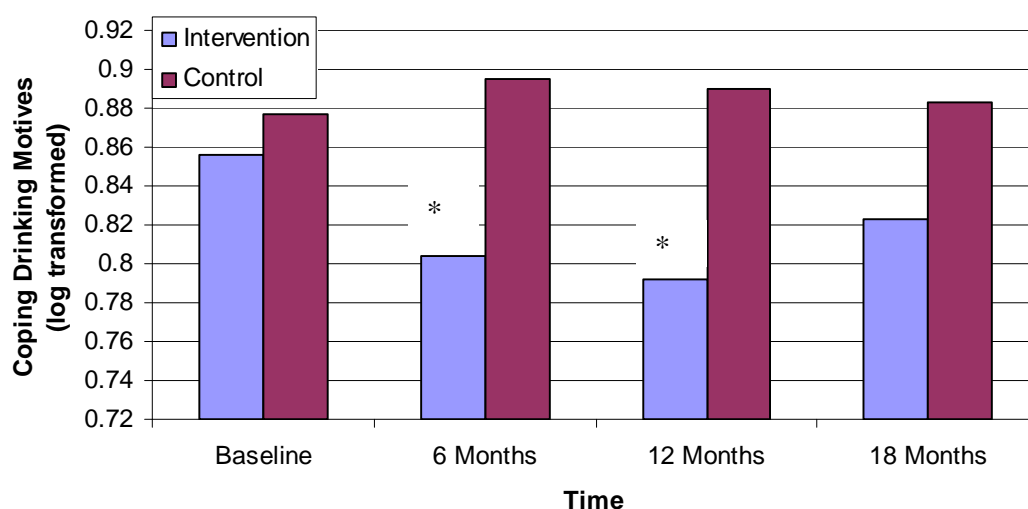


intervention is successful overall, it is especially effecting in preventing against coping-drinking motives for victims of bullying.

**Table 8.2 Mean scores for coping-drinking motives at each of the 4 time points**

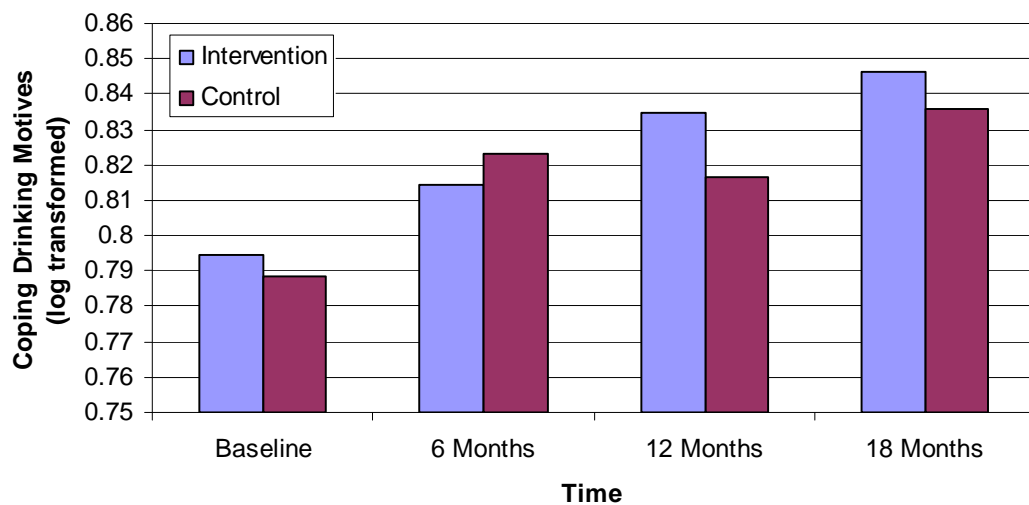
	Baseline	6-Months	12-Months	18-Months
<i>Whole Sample</i>	7.04 (3.91)	7.39 (3.98)	7.44 (3.73)	7.64 (3.78)
Intervention	6.92 (3.50)	7.04 (3.36)	7.42 (3.71)	7.58 (3.54)
Control	7.18 (4.34)	7.80 (4.57)	7.45 (3.76)	7.72 (4.05)
<i>Victims</i>	8.59 (5.43)	8.88 (5.13)	8.50 (4.53)	8.52 (4.40)
Intervention	8.30 (4.81)	7.66 (3.61)	7.60 (4.12)	7.73 (3.38)
Control	8.83 (5.95)	9.93 (5.99)	9.28 (4.76)	9.19 (5.05)
<i>Non-Victims</i>	6.73 (3.45)	7.09 (3.65)	7.22 (3.52)	7.47 (3.63)
Intervention	6.69 (3.18)	6.94 (3.31)	7.39 (3.65)	7.56 (3.57)
Control	6.78 (3.77)	7.29 (4.02)	7.02 (3.35)	7.56 (3.57)

NB: Standard deviations are included in parentheses



\*p<.05

**Figure 8.1a Effect of the intervention on coping-drinking motives over 18 months for victims of bullying**



**Figure 8.1b Effect of the intervention on coping-drinking motives over 18 months for non-victims**

Further repeated measures ANCOVA analyses were conducted to separately investigate the effect of the intervention over time for victim and non-victim groups. Results showed a significant main effect of the intervention for victims of bullying. Victims of bullying who took part in the intervention workshops reported significantly lower scores for coping-drinking motives over the 18-month period [ $F(1,84)=8.23$ ,  $p<.01$ ] (Cohen's  $d=.38$  at 12-months;  $d=.34$  at 18-months). No significant differences over time were shown between non-victims who received the intervention and non-victims who did not receive the intervention.

Separate independent sample t-tests were conducted within the victim and non-victim groups to investigate differences between the intervention and control conditions at each time point. Within the victim group, the intervention and control groups were matched at baseline ( $p=.90$ ). Results showed significant differences between the intervention and control conditions at 6 and 12-months ( $t(89.6)=-2.02$ ,  $p<.05$ ;  $t(91)=-2.05$ ,  $p<.05$ , respectively), with no significant differences shown for 18-months ( $p=.18$ ). Victims who received an intervention reported significantly lower levels of coping-drinking motives in comparison to victims in the control condition; this was an effect that lasted over a 12 month period. Consequently, this intervention was only successful at preventing against

coping drinking motives in victims of bullying over 12 months within an 18-month period. This suggests that additional ‘booster’ intervention sessions may be helpful to prevent against these risky drinking motives over an extended period of time. Results for non-victims showed no significant differences between the intervention and non-intervention control groups at any of the four time points (baseline:  $p=.82$ ; six months:  $p=.59$ ; 12-months:  $p=.21$ ; 18-months:  $p=.40$ ).

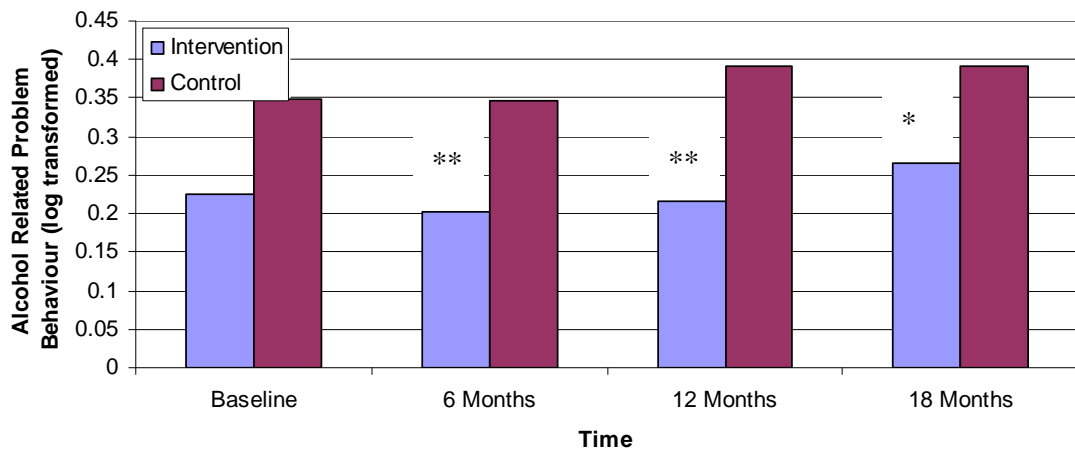
#### *8.5.2 Intervention effects on alcohol-related problem behaviour*

Table 8.3 shows the means and standard deviations for alcohol-related problem behaviour scores at each of the four time points: baseline, 6, 12 and 18-months. These descriptive statistics are presented for the total sample, as well as for the 4 overlapping groups included within these analyses: the intervention and non-intervention control groups, as well as the victims of bullying and non-victims. An analysis of these scores was conducted using repeated measures ANCOVA with both intervention and victimisation status as the between-subject factors. Self reported alcohol-related problem scores over time at 6, 12 and 18-months were the between-subjects factors. Results showed a significant main effect of both intervention and victimisation status [ $F(1,556)=12.20$ ,  $p<0.001$ ;  $F(1, 556)=4.41$ ,  $p<.05$ , respectively], as well as a significant main 2-way intervention by victim group interaction [ $F(1, 556)=7.67$ ,  $p<.01$ ] (see Figure 8.2). Similarly to the previous result for coping-drinking motives, these results suggest that the intervention is especially effecting in preventing against alcohol-related problems for victims of bullying.

**Table 8.3 Mean scores for alcohol-related problems at each of the 4 time points**

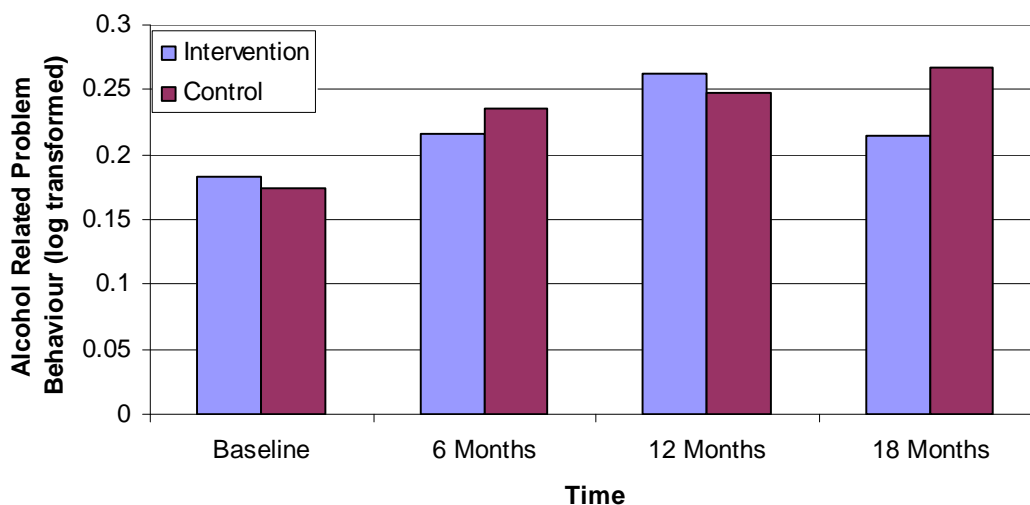
	Baseline	6-Months	12-Months	18-Months
<b>Whole Sample (n=564)</b>	1.11 (1.92)	1.35 (2.08)	1.52 (2.16)	1.43 (2.10)
Intervention (n=304)	1.04 (1.85)	1.17 (1.94)	1.41 (2.01)	1.18 (1.87)
Control (n=260)	1.20 (2.00)	1.55 (2.22)	1.65 (2.31)	1.73 (2.32)
<b>Victims (n=93)</b>	1.74 (2.33)	2.04 (2.27)	2.20 (2.60)	2.06 (2.35)
Intervention (n=43)	1.37 (2.10)	1.40 (2.05)	1.35 (2.10)	1.44 (1.91)
Control (n=50)	2.06 (2.49)	2.60 (2.33)	2.94 (2.78)	2.60 (2.57)
<b>Non-Victims (n=471)</b>	0.99 (1.81)	1.21 (2.01)	1.39 (2.04)	1.31 (2.03)
Intervention	0.99 (1.80)	1.14 (1.92)	1.42 (2.00)	1.14 (1.86)
Control	0.99 (1.82)	1.30 (2.12)	1.35 (2.08)	1.52 (2.21)

NB: Standard deviations are included in parentheses



\*\*p<.01; \*p<.05

**Figure 8.2a Effect of the intervention on alcohol-related problems over 18 months for victims of bullying**



**Figure 8.2b Effect of the intervention on alcohol-related problems over 18 months for non-victims**

Further repeated measures ANCOVA analyses were conducted to separately investigate the effect of the intervention over time for victim and non-victim groups. Results showed a significant main effect of the intervention for victims of bullying. Victims of bullying who took part in the intervention workshops reported significantly lower scores for alcohol-related problems over the 18-month period [ $F(1,87)=7.23$ ,  $p<.01$ ] (Cohen's  $d=.65$  at 12-months;  $d=.51$  at 18-months) (see Figure 8.2). Independent sample t-tests were conducted within the victim group to investigate differences between the intervention and control conditions at each time point. The intervention and control conditions were matched at baseline ( $p=.18$ ). Results showed significant differences between the intervention and control conditions at 6, 12 and 18-months ( $t(91)=-2.74$ ,  $p<.01$ ;  $t(90.71)=-2.88$ ,  $p<.01$ ;  $t(91)=-2.14$ ,  $p<.05$ , respectively). Victims who received an intervention reported fewer alcohol-related problems in comparison to victims in the control condition. This was an effect that lasted over the whole 18-month period.

Repeated measures ANCOVA showed no significant difference between the intervention and control conditions for non-victims. However, a significant 2-way multivariate interaction of time by intervention was found [ $F(2, 464)=3.16$ ,  $p<.05$ ]. Independent

samples t-tests investigated differences between intervention and control groups at each time point. Results showed no significant differences between the intervention and non-intervention control groups at any of the four time points within the non-victim group (baseline:  $p=.82$ ; six months:  $p=.91$ ; 12-months:  $p=.49$ ; 18-months:  $p=.12$ ).

## **8.6 Discussion**

The previous Chapter showed positive effects of a personality-targeted intervention in reducing levels of bullying victimisation. Subsequently, this Chapter aimed to assess whether these same interventions could prevent against the higher levels of coping-drinking motives and alcohol-related problems that have been associated with bullying victimisation, specifically within groups of victims (see Chapter 3 of this thesis). The results from this Chapter have shown that targeting personality can help to prevent against both of these adverse behavioural outcomes in victims of bullying. The success of this intervention to reduce both victimisation as well as consequences associated with victimisation, suggests that bullying victimisation and alcohol-misuse share personality as a common underlying mechanism.

### *8.6.1 Intervention Effects for Coping-drinking Motives*

The intervention was shown to be especially effective at preventing the development of coping-drinking motives for adolescent victims of bullying. This coping-skills based intervention, which is targeted towards personality vulnerabilities has already shown to be successful in reducing coping-drinking motives and problem drinking symptoms, when evaluated on youth categorised as being at 'high personality risk' for substance misuse (Conrod et al., 2008). The current results suggest that this selected intervention can be even more effective for a subgroup of non-targeted, yet more vulnerable adolescents. In this respect bullying victimisation may be perceived as a barometer of more severe problems in adolescents. This result supports theories which suggest that targeted interventions, which are tailored to benefit higher risk groups of participants will show stronger effects for the most vulnerable subgroup within a population. This is due to the population showing comparatively higher levels of risk for problematic behaviours, as well as heterogeneity of risk with regards to the outcome measure (Spoth, 2006).

Victims of bullying who received the intervention showed an overall lower level of coping-drinking motives in comparison to victims who did not receive the intervention. This result was not dependent upon a specific time point. However, further analyses which focused within the victim group showed there to be a significant difference between victims in the control and intervention conditions at both 6 and 12-months post intervention. The intervention therefore worked to prevent against the development of coping-drinking motives for victims of bullying; an effect which was sustained over a 12 month period, but which disappeared at the 18-month follow up. This result suggests that in order to prevent against the development of coping drinking motives over a longer period of time, victims of bullying may benefit from additional ‘booster’ prevention workshops after the initial 12 month period.

#### *8.6.2 Intervention Effects for Alcohol-Related Problem Behaviours*

The intervention was also shown to prevent against alcohol-related problems for victims of bullying over an 18-month period. This result was again not dependent upon a specific time point. However, further analyses which focused within the victim group, showed that victims of bullying who received the intervention reported significantly lower levels of alcohol-related problems at all three time points post baseline: thereby showing that the effect of the intervention for alcohol-related problems was sustained over the full 18-month period.

#### *8.6.3 Implications*

This intervention which is targeted towards adolescents who present with personality specific vulnerabilities with regards to their behaviour has been previously shown to prevent against the development of coping-drinking motives and alcohol-related problems (Conrod, Castellanos-Ryan, & Mackie, 2011). This study has shown that the same interventions can show additional benefit for those adolescents with higher levels of pre-intervention problems (i.e. victims of bullying). This result supports two previous substance-use intervention trials (e.g. Vicary et al., 2004; Vicary et al., 2006; Longshore et al., 2007), which independently showed significant intervention effects for participants who were characterised at baseline as being at increased risk for substance misuse. The current

intervention programme goes one step further than these previous trials, by positively affecting the behavioural outcome for a non-targeted group of adolescents. Accordingly, it can be seen that the coping skills cognitive behavioural aspect to these workshops provoked broader positive consequences than previously intended.

The previous chapter within this thesis provided evidence to suggest that these same personality-targeted interventions work to decrease levels of self-reported victimisation over the same 18-month period. The experience of victimisation can be attributed to both internal and external influences (e.g. Hodges & Perry, 1999; Wolke et al., 2001). Accordingly, it could be argued that the positive prevention effect against victimisation was caused by factors external to the victim. For example, the intervention may effect victimisation by reducing the bullying behaviours of perpetrators who also take part in the programme, or by influencing an inclusive school ethos, that extends indirectly from the intervention participants to the wider school population. However, the development of coping-drinking motives and alcohol-related problems are understood to be caused by internal processes, with coping-drinking motives described as the internal and negative pathway to alcohol-use and misuse (Cox & Klinger, 1988; Cooper, 1994). The results from this chapter have therefore provided evidence to suggest that through a cognitive behavioural focus on coping skills, these interventions can work to directly influence internal processes and prevent against adverse behaviours in those most at-risk adolescents. The results from this study therefore present important implications for reducing the risk for maladaptive coping strategies and associated problematic alcohol-misuse in adolescent victims of bullying.

#### *8.6.4 Limitations*

There are a number of limitations that should be taken into account when interpreting these results. Firstly, the follow-up is limited to an 18-month period. Whilst this is a relatively long time frame within adolescence, more information is needed over a longer period of time to ascertain the developmental ramifications and durability of this preventive effect. Whilst the intervention seems to be working on cognitive processes internal to victims of bullying, it is not possible to fully rule out other reasons behind the success of the



intervention over and above the personality-targeted nature of the programme. For example, the victim group may benefit preferentially due to the workshops exposing them to small, informal peer groups, that may allow them to either make new friends, or to be able to relate to their peers who are coping with their own or similar problems.

Additionally, due to the relatively small sample size of victims included within this trial, this study is not sufficiently powered to rule out the possibility that other confounding variables (some of which may be unmeasured within this trial) may have had an effect on the intervention. For example, differential parenting styles have been associated with adolescent alcohol-use (White, Johnson, & Buyske, 2000), which may make some victims more susceptible to drinking alcohol in order to cope with their adverse experiences. A previous substance-use intervention trial: 'keepin' it REAL' showed differential effects between ethnic groups (e.g. Marsiglia et al., 2011), and demonstrated improved efficacy when adapted collaboratively with high risk adolescents within the community (Bernal, Bonilla, & Bellido, 1995). Interventions which are not tailored for individual differences within groups (e.g. ethnicity, culture, past experiences), may not engage certain adolescents, or may even cause iatrogenic intervention effects (Holleran Steiker, 2008). Therefore, whilst ethnicity was controlled for within these analyses, it would be interesting to assess in a larger sample whether cultural identification has an effect on these current personality-targeted interventions. Finally, this study did not have sufficient power to detect personality specific effects. Previous chapters within this thesis have highlighted the 'anxiety-sensitivity' personality domain to be important both in terms of risk for victimisation as well as intervention effectiveness. Accordingly, future research should attempt to replicate this result and to assess whether the anxiety-sensitive intervention group preferentially benefit with respect to preventing both coping-drinking motives and alcohol-related problems.

#### *8.6.5 Conclusions*

This Chapter has provided evidence to suggest that interventions which are selected for higher risk adolescents can have a preferential effect on a subgroup of adolescent bullying victims. This result is important to show that interventions which are targeted towards

personality vulnerabilities can have broader effects, such that it may not be necessary to develop various interventions which are targeted towards different subgroups. This has strong implications for the field of school-based interventions, both with regards to bullying victimisation and substance misuse. School-based interventions require lots of time and man power and therefore it may not be feasible to expect schools to effectively deliver a number of different programmes. Further, with respect to the overall aim of this thesis, the previous two chapters can help to explain the functional relationship between bullying victimisation and alcohol-misuse. Taken together these Chapters provide evidence to suggest that personality may act as a factor within a common underlying mechanism for both victimisation and alcohol-related problems.

## **Chapter 9: GENERAL DISCUSSION**

### **9.1 Summary of findings**

Using three separate samples, the research described within this thesis aimed to:

- 1) Investigate the functional relationship between school-based bullying victimisation and alcohol-misuse through the examination of two models of comorbidity: the causal model and the common underlying mechanism models.
- 2) Investigate the cognitive and neural vigilance for emotional stimuli shown by victims of bullying.
- 3) Assess the efficacy of school-based interventions aimed at reducing cognitive distortions in high risk children to reduce both levels of victimisation, as well as alcohol-misuse in a subgroup of highly victimised adolescents.

#### *9.1.1 Chapter Three*

The primary aim of the first study (Chapter 3) in this thesis was to assess a causal model for comorbidity between bullying victimisation and alcohol-related problems. Results showed that bullying victimisation was predictive of alcohol-misuse, and that this relationship was partly explained by the development of coping-drinking motives. No evidence was shown for a predictive relationship between victimisation and the increased consumption of alcohol over and above drinking motives, baseline alcohol drinking and alcohol-related problems. Further, coping-drinking motives were associated uniquely to alcohol-related problems, rather than to an increase in alcohol consumption levels, whilst non-coping-drinking motives were related to increased alcohol consumption, followed indirectly by a risk for alcohol-misuse. Accordingly, this study provided support for a causal comorbidity model between bullying victimisation and alcohol-misuse, partially explained by the development of an avoidant coping-drinking style.

#### *9.1.2 Chapter Four*

The primary aim of this Chapter was to investigate whether two lower order personality domains (derived from neuroticism), which have already been shown to predict substance and alcohol-use, would also be predictive of victimisation. Should these personality

domains increase risk for victimisation, it would suggest that risk for both alcohol-use and victimisation is conferred through the same personality factors, thereby providing support for the common underlying mechanism model of comorbidity. The second aim of this chapter was to investigate the role of emotional symptoms in the relationship between personality and victimisation. Results showed that ‘hopelessness’, but not ‘anxiety-sensitivity’ was related to victimisation after an 18-month period. However, this relationship became non-significant when baseline victimisation and the development of emotional symptoms were accounted for. The development of emotional symptoms at both 6 and 18-months were shown partially to explain separate, indirect pathways between both personality domains to victimisation over the 18-month period. These results were on the whole replicated using an independent longitudinal study, with an identical design. ‘Hopelessness’ and ‘anxiety-sensitivity’ were shown to fulfil separate roles within the functional relationship between bullying victimisation and alcohol-misuse. Results suggested that ‘hopelessness’ represents a factor within a common mechanism model of comorbidity; ‘hopelessness’ fully accounted for the relationship between victimisation and alcohol-misuse. ‘Anxiety-sensitivity’ was instead shown to moderate a potential causal relationship between the two outcomes: victims who are highly anxiety-sensitive are more likely to develop alcohol-related problems over an 18-month period.

### *9.1.3 Chapter Five*

This Chapter aimed to examine the cognitive style of victims of bullying by examining their perceptual accuracy in identifying different emotions in emotionally ambiguous face stimuli, and to compare this level of vigilance both to adolescents who have been exposed to a trauma and those who have experienced neither trauma nor victimisation. Results showed that victims of bullying and trauma-exposed adolescents displayed similar heightened levels of vigilance to fearful faces in the context of threat (i.e. anger). This similarity between victims and trauma-exposed adolescents provides indirect evidence in favour of a causal model of comorbidity between victimisation and alcohol-misuse, suggesting that the heightened levels of emotional vigilance, which is implicated within self medication models, is a consequence of the victimisation. Whilst trauma-exposed adolescents showed significantly higher levels of vigilance in comparison to their

uninvolved peers, the difference between victims and controls did not reach significance. A significant linear trend was shown between the three groups, with trauma-exposed adolescents showing the greatest levels of emotional vigilance when interpreting ambiguous social-emotional information, and uninvolved adolescents showing the least.

#### *9.1.4 Chapter Six*

The primary aim of this Chapter was to investigate the neural correlates of victims' emotional reactivity to angry and ambiguous faces within eight a-priori neural regions of interest (which included both emotional and cognitive brain centres). Following on from results from the previous Chapter, a combined victim group (consisting of victims of bullying and trauma-exposed adolescents) was compared to a group of uninvolved adolescents. No significant between-group differences in emotional vigilance to angry faces were shown in any of the eight brain regions; a significant trend was shown for increased amygdala activation in the combined-victim group when presented with ambiguous faces. A subgroup of combined victims who reported emotional symptoms with a high level of impact, demonstrated increased activity in the right anterior cingulate, in comparison to an uninvolved control group, when presented with angry and ambiguous faces. The second aim of this Chapter was to investigate the relation between neural activation to faces and emotional symptoms. Emotional symptoms were associated with increased activation in different brain regions for both groups, with the anterior cingulate showing increased activation in response to both angry and ambiguous faces for the combined-victim group. Activation of the orbitofrontal cortex was associated with increased emotional symptoms for both groups. Additionally, negative impact from emotional symptoms were shown to mediate the relationship between victimisation and alcohol-use. These results provide indirect evidence in favour of a causal comorbidity model, highlighting the important role for negative emotional symptoms within this functional relationship.

#### *9.1.5 Chapter Seven*

The primary aim of this Chapter was to assess whether personality-targeted interventions were effective for decreasing levels of victimisation over an 18-month period. The

secondary aim of this chapter was to understand further how these interventions may be working by assessing their impact on avoidant and active/positive coping strategies. Results showed that the intervention was effective at reducing victimisation levels specifically within the ‘anxiety-sensitive’ group. The intervention and non-intervention groups were matched at baseline. At all follow-up time points post-intervention, the intervention group reported significantly lower levels of victimisation in comparison to the non-intervention control group. No significant effects of the intervention were shown between the intervention and non-intervention control groups for those adolescents who scored high in ‘hopelessness’. Results for coping strategies showed that specifically within a subgroup of adolescents who scored highly for ‘anxiety-sensitivity’, youth who received the intervention showed significantly greater positive coping-skills at six months post-intervention, in comparison to adolescents who did not receive the intervention. No effect of the intervention was shown for avoidant coping strategies. Finally, this Chapter aimed to replicate these results through analysing data from a similar intervention trial, which utilised the same personality-targeted interventions, but which were implemented by trained teachers, rather than therapists. Results from this trial showed a main effect of the intervention in reducing victimisation levels over an 18-month period. In contrast to the previous findings, this result was not shown to be specific to a personality group.

#### *9.1.6 Chapter Eight*

This Chapter aimed to evaluate the effectiveness of a personality-targeted intervention on decreasing the heightened risk for coping-drinking motives and alcohol-misuse for adolescent victims of bullying, that has been reported in Chapter 3. Results showed that in addition to a main effect of the intervention on both outcome measures, which has been previously reported (Conrod et al., 2011), the intervention effect was shown to interact with victim status for both coping-drinking motives and alcohol-related problems. Victims of bullying who received an intervention reported lower scores for coping-drinking motives at both 6 and 12-months post-intervention, in comparison to those victims of bullying who did not take part in the intervention workshops. No significant effects of receiving an intervention were shown for non-victims in comparison to non-victims who did not participate in the intervention workshops. Similarly, victims who received an intervention

reported significantly lower rates of alcohol-related problems over the full 18-month period post intervention, in comparison to victims who did not receive an intervention. No significant differences were shown between the intervention and non-intervention control groups at any time point within the non-victim group. Subsequently, results from Chapters 7 and 8 suggest that these school-based interventions which are targeted towards personality vulnerabilities and aim to reduce cognitive distortions and improve coping skills, can effectively reduce both victimisation as well as alcohol-misuse in victims of bullying.

## **9.2 Discussion of findings**

The novel focus of this thesis on the relationship between school-based bullying victimisation and alcohol-misuse has helped to advance understanding of the mechanisms underlying this relationship. The empirical aims of this thesis focused on understanding the functional relationship between victimisation and alcohol-misuse, through the use of two models for comorbidity. The results of these current studies provided evidence in favour of both of these models, suggesting that victimisation may cause alcohol-misuse, yet the risk for both is heightened through common vulnerabilities, including personality characteristics and strategies for coping with negative emotions.

### *9.2.1 Causal model for comorbidity*

Bullying victimisation was shown to predict alcohol-related problems over a 12 month period, with this relationship partially understood by the development of coping-drinking motives. No longitudinal relationship was shown between bullying victimisation and alcohol consumption levels. This result extends findings from previously published studies and perhaps helps to explain inconsistencies seen within the literature, which has until now focused solely on levels of consumption (e.g. Nansel et al., 2004; Sullivan et al, 2006; Tharp-Taylor et al, 2009). The measurement of alcohol consumption in relation to victimisation may approximate victims' experiences with alcohol, yet this may not be sensitive enough to specific facets underlying this drinking behaviour. Specifically, victims may be at increased risk for occasional excessive consumption due to their adverse experiences; a style of drinking triggered by emotional distress (Colder et al., 2002).

Accordingly, victims of school based bullying may not drink high levels of alcohol frequently, yet when they do drink, they are at risk of adopting a drinking style which places them at heightened risk for dependence symptoms. This result was also supported using data from the IMAGEN project in Chapter 6, which showed that whilst victimisation was not directly associated with increased alcohol consumption levels, there was an indirect effect through the development of negative emotional impact. Consequently, the manner in which victims emotionally cope with their experiences may be an important factor in their heightened risk for alcohol-misuse. This conclusion is supported throughout this thesis which has shown the pivotal role of emotional symptoms (including physiological complaints and negative affect), in victims' differential response to social cues, the risk for re-victimisation, as well as the successful reduction in both alcohol-misuse and victimisation upon the targeting of these negative emotional processes.

In addition to increased levels of emotional symptoms, victims of bullying showed heightened levels of vigilance to novel emotional stimuli at a cognitive level, which was similar to the hypervigilance shown by trauma-exposed youth. Whilst these analyses were cross-sectional in their design, the similarity between these groups suggests that the emotional hypervigilance is a consequence rather than a cause of the victimisation. Accordingly, this result provides indirect support in favour of a causal model for comorbidity between victimisation and alcohol-misuse. This hypervigilance for fear, which was only present when primed by angry faces, supports a previously published study (Pollak and Kistler, 2002), which showed a similar anger-specific bias displayed by maltreated children. This increased fear vigilance, may predispose or exacerbate the effects of interpersonal problems (see Visu-Petra, et al., 2010), thereby leaving victims vulnerable for future re-victimisation, or alternatively, increasing the severity of their victimisation experiences. However, it may also play a role towards increasing the risk for alcohol-misuse in victims of bullying, in a similar fashion to the established relationship between hyperarousal and alcohol-use upon exposure to a traumatic event (e.g. Stewart et al., 1999).

Due to similar responding on the cognitive task, a combined victim group (consisting of both victims of bullying and trauma-exposed adolescents) were utilised to investigate



neural response to threatening social stimuli (i.e. angry or ambiguous faces). Increased activation of the anterior-cingulate was implicated in response to angry and ambiguous faces for those victims who showed increased negative emotional impact. Additionally, increased emotional symptoms were associated with increased response within the anterior cingulate to both angry and ambiguous faces for the combined-victim group. This result supports previous studies that have implicated this brain region as a ‘neural alarm’ for threat (see Eisenberger et al., 2003). The anterior cingulate is involved in both cognitive and emotional processes (Bush et al., 2000), and has been shown to activate in response to traumatic-reminders for trauma-exposed adolescents, (e.g. Yang, 2004).

In further support of a causal comorbidity model, heightened levels of negative emotional impact were also implicated in the risk for increased alcohol-use in relation to bullying victimisation. Future studies should therefore investigate the effect of this negative emotional impact for alcohol-misuse. Whilst this information was not available within this study, this result suggests that negative emotional impact from victimisation experiences may increase the risk for alcohol-misuse in victims, possibly due to its effect on neural processes. Accordingly, in addition to attempting to prevent against bullying perpetration, intervention strategies should also address the emotional impact that bullying has for victims, in order to prevent against adverse mental health and behavioural outcomes.

The functional causal relationship between victimisation and alcohol-misuse can also be partially explained by the development of coping-drinking motives. In support of a drinking motives model reported by Cooper and colleagues (1995), the current analyses showed that victims’ drinking was uniquely influenced by coping motives, a style of drinking that increases the risk for alcohol-related problems (Kuntsche et al., 2007). The lack of a relationship between school-based bullying victimisation and other drinking motives (i.e. social, enhancement, conformity) accentuates the specific risk for alcohol-misuse associated with school bullying victimisation. Neurotic personality traits, which are associated with coping-drinking motives (e.g. Cooper et al., 2000), were also shown to be involved in the functional relationship between bullying victimisation and alcohol-misuse. Specifically, ‘anxiety-sensitivity’ was implicated within a causal comorbidity model.

‘Anxiety-sensitivity’ moderated the predictive relationship between bullying victimisation and alcohol-misuse; high levels of ‘anxiety-sensitivity’ were associated with greater alcohol-misuse for victims of bullying.

#### *9.2.2 Common underlying mechanism for comorbidity*

Results from this thesis support previous research, which has established an association between neurotic personality domains and alcohol-misuse (e.g. Stewart et al., 1992; Stewart et al., 1999). Two lower order neurotic personality domains (‘anxiety-sensitivity’ and ‘hopelessness’) were shown indirectly to predict future bullying victimisation, through the manifestation of emotional difficulties, a result which was for the most part replicated within a second similar longitudinal study. These personality domains were shown to have differential roles within the functional relationship between bullying victimisation and alcohol-misuse, with ‘hopelessness’ acting as a common factor to increase the risk for both outcomes; this result lends support to a common mechanism model for comorbidity; whilst ‘anxiety-sensitivity’, as aforementioned is a moderator within the predictive path from victimisation to alcohol-misuse.

The way in which individuals experience and express emotions determines their level of social competence (Eisenberg et al., 2000), with the intensity of emotions felt by individuals influencing the goals pursued in social situations (Saarni 1999). Public displays of emotional symptoms, such as those captured by the emotional symptoms subscale utilised in this study, may be interpreted as a weakness and picked on by peers. The pivotal role played by emotional symptoms within this pathway of risk from personality to victimisation, infers support for a common underlying mechanism to explain the comorbidity between bullying victimisation and alcohol-misuse. In a similar role to that shown by personality, the experience of negative emotion has also been strongly associated with a risk for alcohol-misuse, as shown by the relationship between PTSD and alcohol problems (e.g. Epstein et al., 1998; Clark and colleagues, 2003).

### *9.2.3 Effectiveness of a personality-targeted intervention*

Personality has been implicated within the risk for both bullying victimisation and alcohol-misuse. Within this thesis, the same personality traits that have been shown previously to confer risk for alcohol-misuse (i.e. ‘anxiety-sensitivity’ and hopelessness) have been shown to be important in the risk pathway for victimisation. Further, these personality domains have been shown to hold separate roles within the functional relationship between bullying victimisation and alcohol-misuse. The role of personality for both of these outcomes does however suggest that interventions targeted towards changing personality-specific coping behaviours, may be beneficial for both the cause of bullying victimisation, as well as the associated consequences. Efforts within the intervention field to reduce both alcohol-misuse and victimisation have delivered inconsistent findings, with few studies assessing targeted interventions (e.g. Foxcroft et al., 2003; Fletcher et al., 2008; Vreeman & Carroll, 2007). This assessment of a personality specific intervention for victims of bullying is novel within both the alcohol and bullying fields.

Results showed that the personality-targeted intervention decreased self reported victimisation over an 18-month period, specifically for highly ‘anxiety-sensitive’ adolescents; no significant effect was shown within the ‘hopelessness’ group. This result supports previous findings which showed positive effects of an intervention which targeted victims of bullying with high levels of anxiety (Berry & Hunt, 2009). The differential effects of the intervention on victimisation levels may reflect the nature of the intervention programme. The personality interventions differed regarding the types of cognitive distortions that they targeted. Results from this thesis have associated victimisation with cognitive and neural hypervigilance or responsivity to threatening and ambiguous social cues. The ‘anxiety-sensitivity’ intervention targeted this hypervigilance and catastrophic thinking, whereas the ‘hopelessness’ intervention did not. Consequently, the effectiveness which was specific to the ‘anxiety-sensitive’ intervention group indirectly supports the role for emotional hypervigilance in the risk for victimisation.

Further, the interventions worked effectively to enhance positive coping-skills over a six month period within the same anxiety-sensitive group; an effect which was associated with

a reduction in future victimisation at 12-months post intervention. The effect of this intervention supports previous research which has shown a positive association between active coping strategies and decreased bullying victimisation (Kochenderfer-Ladd, 2004). Taken together, these current results mirror Berry and Hunt's (2009) findings and suggest that the effectiveness of this intervention for 'anxiety-sensitive' adolescents may be due to its psycho-educational focus which teaches positive coping strategies to help teens to de-catastrophise their reactions to threatening social cues.

In a further novel approach, this thesis utilised a second intervention trial to assess the effect of the same personality-targeted interventions when implemented within an independent sample by school teachers (instead of therapists). Whilst the replication trial showed an overall positive effect of the intervention on victimisation, this effect was not specific to a personality group. The results from both trials suggest that administering separate and targeted interventions is important for the effective reduction of victimisation, yet there may not necessarily be differences in effectiveness between the personality groups.

The same interventions have been previously shown to reduce alcohol-related problems in all high risk youth and coping-drinking motives in youth with high levels of anxiety-sensitivity (Conrod et al., 2011). This thesis extended this previous research and showed that the same personality-targeted interventions were particularly helpful in preventing against the development of both coping-drinking motives and alcohol-related problems in victims of bullying. Targeted interventions, which are tailored to benefit participants with higher levels of risk have been shown to have increased effectiveness for the most vulnerable subgroups within high risk populations (Spath, 2006). The results from this thesis therefore support this finding, as well as two previous substance-use intervention trials (e.g. Vicary et al., 2004; Vicary et al., 2006; Longshore et al., 2007), which showed significant intervention effects for participants who were characterised at baseline as being at increased risk for substance misuse. This intervention programme however goes one step further than these previous trials, by affecting the behavioural outcome for a non-targeted group of adolescents.

Accordingly, it can be seen that the coping skills cognitive behavioural aspect to these workshops provoked broader positive consequences than previously intended. The interventions which were targeted towards ‘higher risk’ adolescents not only decreased levels of self reported victimisation but also directly prevented the development of coping-drinking motives and alcohol-related problems within a subgroup of victims of bullying.

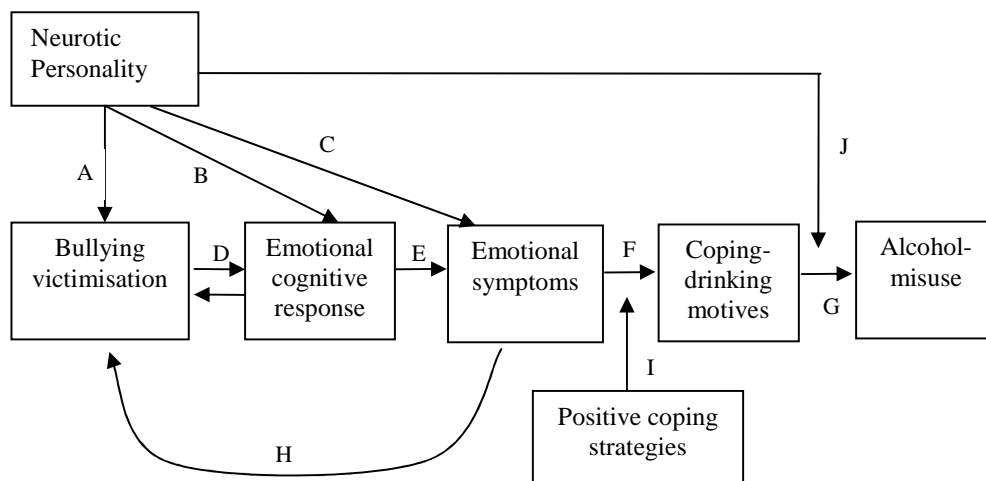
#### *9.2.4 An integrative model of comorbidity*

Taken together, the results from this thesis suggest that both the causal model and common underlying mechanism model for comorbidity may be relevant to explain the relationship between victimisation and alcohol-misuse (see Figure 9.1). The specific model of comorbidity seems to depend on the victims’ personality domain, with ‘hopelessness’ implicated within a common mechanism model and ‘anxiety-sensitivity’ implicated within a causal model. With regards to a third exacerbation model of comorbidity, this has not been directly examined within this thesis, however the results suggest that increased levels of both ‘hopelessness’ and ‘anxiety sensitivity’ may exacerbate both the risk for in addition to any negative consequences of both bullying victimisation and alcohol-misuse. The results from this thesis have gone beyond identifying an association between these two outcomes and have provided evidence to understand the functional relationship driving this association. Furthermore, this thesis has endeavoured to apply this new knowledge regarding these underlying mechanisms within an intervention model. The results from the intervention analyses suggest that successful school-based interventions against both the causes and consequences of victimisation need not be limited to focused ‘anti-bullying’ interventions. Instead, behavioural interventions which target specific or common risk factors (such as personality vulnerabilities, the cognitive emotional consequences of victimisation, and coping strategies) can successfully and indirectly work to reduce victimisation and its behavioural consequences, namely the risk for alcohol-misuse.

### **9.3 Strengths**

In order to gain a comprehensive understanding of the mechanisms underlying the relationship between bullying victimisation and alcohol-misuse, this thesis has utilised data

from three different studies and incorporated a variety of methodologies which are believed to be unique to this research area.



**Figure 9.1 Theoretical integrative model showing the relationship between bullying victimisation and alcohol-misuse**

NB: This figure depicts the different comorbidity paths between bullying victimisation and alcohol-misuse. Support for the different components has been gathered within different Chapters of this thesis: Chapter 4 provided evidence for paths A, C, H and J; Chapters 5 and 6 provided evidence to suggest the role of paths D, E, F and G; Chapter 7 provided evidence for path H; Chapter 3 showed path G; Chapter 8 provided evidence for paths F and I. Future research should investigate path B within this model, as well as directly investigate paths F and I.

Firstly, longitudinal data were used to assess pathways of risk for victimisation, which were then replicated in a large second sample using a longitudinal study with a similar design. Secondly, in a design novel to this thesis, victims' cognitive vigilance for emotional stimuli was assessed and compared both to those adolescents who have experienced a traumatic event as well as to their uninvolved peers. This was investigated using data from a large cross-national study thereby allowing these results to be generalised across nationalities and cultures. This unique design showed the comparability between bullying and trauma exposure, subsequently allowing an insight into the severity of bullying victimisation. In addition to this, victims' neural activation to emotional stimuli was also assessed and compared to uninvolved adolescents. The results taken from both of these methods

highlight the negative effect that the experience of victimisation may have on victims' approach to future social situations.

Thirdly, following the knowledge gained from investigating the comorbidity between victimisation and alcohol-misuse, this thesis then evaluated an intervention programme which targeted some of these factors (i.e. personality and coping skills). This type of intervention has never been assessed for victimisation and was able to show how the mechanisms for risk identified within this thesis, could translate into prevention for both the cause of victimisation, as well as associated consequences. Further, the effectiveness of the intervention for reducing levels of self reported victimisation was replicated within a second intervention trial. This trial utilised the same intervention programmes, but trained teachers rather than therapists to facilitate the workshops. These results are important to show that interventions which are targeted towards personality vulnerabilities can have broader effects, such that it may not be necessary to develop various interventions targeted towards different subgroups. This has strong implications for the field of school-based interventions, both with regards to bullying victimisation and substance misuse. School-based interventions require lots of time and man power and therefore it may not be feasible to expect schools to deliver effectively a number of different programmes. The current research provides evidence to suggest that these personality specific workshops may be sufficient and therefore more cost-effective in prevention efforts against both victimisation, as well as its associated adverse behavioural consequences.

Previously published intervention trials have blamed differences in implementation strategies for the lack of replication (e.g. Roland et al., 2000). The replication of the reduction in victimisation levels shown within this thesis, demonstrates that this is a robust effect which can translate across two different implementation models. In order for an intervention to claim broad success, it should be translatable to multiple settings, countries and languages. Outcomes from the Preventure trial for alcohol and substance misuse have already been replicated in both North-American and European contexts (e.g. Conrod et al., 2006; Conrod et al, 2010), providing evidence to support the transferability of this design. Accordingly, these targeted interventions may prove to be transferable across cultures and

research groups, allowing for a broader impact of this design upon reducing school-based victimisation. Further, the intervention programmes assessed within this thesis included three post-intervention follow up time points that spanned an 18-month period. In a recent review of 31 intervention studies, Ryan and Smith (2009) report that two thirds of the studies reviewed included only one post-intervention follow-up, which took place an average of 8.6 months following the intervention.

Fourthly, this thesis utilised an adolescent sample, which is important for the investigation of victimisation and alcohol-use. Adolescence is a crucial development period, but it also represents the only time period within which the comorbidity between victimisation and alcohol-misuse can be fully assessed, as alcohol-misuse starts to become a problem within this time. In these studies our adolescents were aged 13 to 16 years old, which are considered peak years for substance-use initiation (Patton et al., 2004; D'Amico & McCarthy, 2006). Additionally, this thesis included both female and male adolescents from varied ethnic backgrounds. The Preventure and Adventure samples were recruited from within Greater London, UK; however, the sample for the IMAGEN project is cross-national and made up of 14 year olds from 4 different countries and 8 different study sites.

#### **9.4 Limitations**

When interpreting the results from this thesis, it is important to take the research limitations into account. Firstly, whilst evidence has been accumulated in support of a causal model of comorbidity between victimisation and alcohol-misuse, more research is needed which utilises longer-term longitudinal data before any firm conclusions can be reached. Part of the support for causality was reached by comparing emotional vigilance between groups. However, this was based on cross sectional data; therefore these interpretations need to be supported with further longitudinal research.

Secondly, the categorisation of victims and non-victims was based solely on self-report data, which is susceptible to bias and may limit the experimental validity of these data. However, self report data are commonly used and have been shown to be valid and reliable for the assessment of both bullying victimisation and substance-use (Smith, McCarthy, &



Goldman, 1995; Olweus, 2009). However, self report methods also hold limitations. Reporting on negative personal experiences requires the individual to acknowledge and understand their role within bullying. This may be difficult for some students, whilst others may be reluctant to recall emotionally painful experiences (Ladd & Kochenderfer-Ladd, 2002; Salmivalli & Peets, 2009), particularly in a classroom setting alongside their peers. This may have led to under-reporting by some students. To counter this possibility, trained research assistants as well as familiar teachers, supervised data collection in exam conditions wherever possible and confidentiality was guaranteed. Further, the longitudinal nature of the research allowed participants to become familiar with the self-report methodology and allowed for the evaluation of reliable reporting over time. The use of other informants (such as peers and teachers) in future research may be useful to catch more cases of victimisation. However, this may be less appropriate for adolescents, due to bullying experiences often being more secretive or subtle during adolescence, which may make the bullying less noticeable to peers or teachers (Smith & Levan, 1995; Ladd & Kochenderfer-Ladd, 2002). This can also be seen with the low level of agreement between different informants (Ronning et al., 2009; Wienke Totura et al., 2009), suggesting that self report methods are perhaps the most appropriate for an adolescent sample.

Thirdly, this thesis did not attempt to disentangle potential gender differences in the relationship between victimisation and alcohol-use. Differences in prevalence rates have been shown between genders with regards to bullying victimisation (see Arseneault et al., 2010), and gender has been shown to effect how victims perceive their experiences (Paquette & Underwood, 1999). Further, in the limited literature on victimisation and alcohol-use, many of the published studies have shown effects to be gender specific; although conflicting in their conclusions (e.g. Sullivan et al., 2006; Tharp-Taylor et al., 2009). Within this thesis, the Preventure and IMAGEN studies were not sufficiently powered for meaningful between gender analyses. The effect of gender as a moderator was assessed within the larger Adventure study, which showed that gender did not significantly affect the relationship between personality and victimisation. Whilst gender was included as a covariate for all analyses within this thesis, and therefore the effects can be shown to exist over and above the effect of gender, it is important for future research to delve deeper

into potential gender differences in the functional relationship between victimisation and alcohol-misuse.

Fourthly, due to similar issues with statistical power, this thesis did not differentiate between 'pure' victims of bullying and those victims who also engage in bullying their peers. This group of provocative victims, who also engage in bullying perpetration, have been shown to be at heightened risk for emotional and behavioural problems (e.g. Nansel et al., 2001). Subsequently, it is important for future studies to investigate the motivational mechanisms towards alcohol-related problem behaviour and consumption of use within groups of provocative 'bully-victims', in order to tailor intervention programmes to their specific needs.

A fifth limitation to this research is that this thesis did not investigate differences that may exist between different types of bullying with respect to a relationship with alcohol-misuse. Instead this thesis presents results which reflect potential functional relationships between general victimisation from bullying and alcohol-misuse. Future research should consider differences between types of bullying victimisation and how these differences may affect victims' engagement with alcohol and their risk for developing alcohol-related problems. Further, previous research has suggested that gender differences may exist between the different types of bullying (see Smith, 1994). Future research should therefore investigate potential interactions between gender and the type of bullying with respect to alcohol-misuse. Further, this thesis did not account for two prevalent forms of bullying: indirect bullying, which includes actions that are achieved via a third party for which the perpetrator is not necessarily present or directly linked to the act (e.g. rumour mongering) and newer cyber-bullying forms of victimisation. Cyber-bullying is becoming increasingly prevalent alongside technological advances, with perpetrators of bullying utilising mobile phone and social networking internet technologies to target their victims beyond the boundaries of school. This form of bullying has been associated with significant levels of emotional distress, which have been shown to be similar to those of traditional school-based victimisation (Smith et al., 2008), as well as to substance-use (Mitchell et al., 2007). Further, cyber-bullying allows for more secretive, anonymous acts of aggression, which can

be committed by a wider variety of adolescents. Whilst this was beyond the scope of this thesis, understanding the consequences of cyber-bullying is important, as this form of bullying may change the traditional roles and characteristics, as well as prevalence rates for both victims and perpetrators.

Specific methodological limitations should also be taken into account when interpreting the results from this thesis. The current mood of the adolescents may have affected emotional vigilance levels (e.g. MacLeod, 1986). This was not tested for in the current thesis, however, it would be interesting to assess whether mood has an affect on threat vigilance across a longitudinal cognitive design. Further, the morphed faces task which was used to assess emotional vigilance included four continua: anger to fear, anger to sad, happy to fear and happy to sad. The results from this study would have benefited from two further continua: anger to neutral and happy to neutral in order to distinguish whether the fear vigilance shown by victims of bullying was specific to fear or instead due to the anger context. Within the fMRI task, ambiguous faces were utilised in the absence of fearful faces, however, the two conditions cannot be directly comparable and therefore generalisation of the ‘ambiguous’ results should be taken with caution.

Further, this thesis did not investigate the relationship between neural activation to emotional stimuli and alcohol-misuse. This is an important area for future research to examine in order to fully understand the causal relationship between victimisation and alcohol-misuse. Previous research has shown that risky alcohol-use (i.e. binge drinking) can increase negative emotional sensitivity (e.g. Duka, Townshend, Collier, & Stephens, 2002) and lead to a hypervigilance for fear from emotional face stimuli (Townshend & Duka, 2003), with associated alterations to amygdala and prefrontal cortex brain regions (Duka et al., 2003; 2004). Consequently, future research should investigate whether any previous alcohol-use or binge-drinking can account for the differential cognitive and neural emotional responsivity shown by victims of bullying.

A further methodological limitation is seen in the identification of the trauma-exposed ‘victim’ group. This was achieved using a screening question for post-traumatic stress

disorder, which asked participants to think back over their whole life, and did not provide a specific time span (as was the case for bullying victimisation). The effect of the trauma may differ depending on event recency. As such, participants within this group may behave differently, depending on when they experienced their trauma and the impact that this event had upon their lives both currently and at the time of the trauma. Further, this classification of trauma-exposed adolescents did not differentiate between those who have experienced a one-off trauma compared to those who were subject to repeated trauma. This should be assessed in future research in order to ascertain whether prolonged trauma effects emotional vigilance, and whether differences would be shown between those adolescents exposed to a repeated trauma compared to those exposed to a one-off trauma.

With regards to the interventions, neither the Preventure nor Adventure trials administered a placebo control condition, which would have methodologically strengthened the study; these interventions were evaluated in comparison to control groups who were exposed to general coping skills information through the national school curriculum. Future studies should investigate whether a placebo-controlled trial is necessary in evaluating the efficacy of the intervention with respect to school-based victimisation. In addition, interventions could benefit from including a family centred or home approach (see Lopez et al., 2008). In a meta-analysis of bullying prevention programmes, elements such as parental training and informing parents about the bullying, were important factors towards the effectiveness of the programmes (Ttofi & Farrington, 2011). With regards to alcohol-use, family factors such as parental monitoring and supervision, as well as the closeness of the parental-child bond, has been shown to decrease the likelihood of adolescent substance-use (Kerr & Stattin, 2000). Therefore prevention programmes which combine both adolescent centred and family involvement may help to improve longer term efficacy.

Whilst the current personality-targeted interventions seem to be working to adapt internal processes, such as coping strategies for victims of bullying, it is not possible to rule out other reasons for the interventions' success, over and above the personality-targeted nature of the programme. For example, the victim group may benefit preferentially due to the workshops exposing them to small, informal peer groups, that may either allow them to

make new friends, or to relate to their peers who are coping with their own or similar problems. Finally, a previous substance-use intervention trial: ‘keepin’ it REAL’ showed differential effects between ethnic groups (e.g. Marsiglia et al., 2011). Interventions which are not tailored for individual differences within groups (e.g. ethnicity, culture, past experiences), may not engage certain adolescents, or may even cause iatrogenic intervention effects (Holleran Steiker, 2008). Therefore, whilst ethnicity was controlled for within these analyses, it would be interesting to compare the effect of these current personality-targeted interventions between different ethnic groups.

### **9.5 Implications for research and clinical practice**

Taken together, this thesis has provided both theoretical and translatable evidence to support a functional relationship between bullying victimisation and alcohol-misuse in adolescence. Unique to this research, a causal association between these two adverse outcomes has been shown to be partially driven by the development of risky coping-drinking motives. Victimisation appears therefore to encourage a quality of drinking style that differs from normal drinking patterns, thus creating a greater risk for future substance-use disorders. Further, vulnerabilities posed by neurotic personality traits, as well as a heightened vigilance for negative emotion, have been shown to drive the risk for future victimisation. Importantly, this research has reiterated calls in the literature to view bullying victimisation as a serious mental health risk, with empirical evidence showing that victims of bullying react to threat in a similar manner to those adolescents exposed to trauma. Accordingly, victimisation from bullying should be recognised as a potentially severe trauma within adolescence, which can lead to adverse long-term consequences, as well as to changes in the manner in which victims approach future social situations. Most importantly, this research has applied the knowledge gained from the first 4 empirical Chapters to show that these findings can effectively translate within an intervention model, such that personality-targeted interventions can work to reduce victimisation, as well as the coping strategies and alcohol-use patterns exhibited by victimised youth.

There are certain areas which future research should focus on to help to understand better the mechanisms explored within these current studies. Firstly, the research field would

benefit from longer term follow up studies, which would allow an assessment of whether the risk posed from victimisation for maladaptive coping and alcohol-misuse extends into adulthood. With respect to intervention models, this thesis presented effects over an 18-month period, which is a relatively long time in comparison to other intervention studies. Following up the participants beyond the adolescent years would show the extent of the effectiveness of targeting personality vulnerabilities in preventing against adverse behavioural and mental health outcomes.

Evidence within this thesis showed victims of bullying and trauma-exposed adolescents to be cognitively comparable in response to threatening social cues. Accordingly, the functional model of risk shown for alcohol-misuse should be applied to other vulnerable or traumatised adolescent groups, to assess whether the same risk pathways are applicable to these groups. Differences in cognitive processing have been shown between depressed and anxious people (MacLeod, 1986). Whilst beyond the scope of this thesis, future research should assess whether victims' differential cognitive and neural threat response is dependent on their personality (e.g. Canli, Sivers, Whitfield, Gotlib, & Gabrieli, 2002). Depression, which is associated with the hopelessness personality domain, has been linked to negative thoughts regarding past experiences, whereas anxiety has been associated with worries linked to future threat (Beck, 1976). Subsequently, there may be differences in threat vigilance between victims who score highly for these separate personality vulnerabilities. Cognitive and neural differences between 'hopelessness' and 'anxiety-sensitivity' may help to explain why these current interventions were not shown to be successful in reducing victimisation for the hopelessness intervention group. It is possible that these interventions work to improve how victims cope with future adverse social situations, as shown by the intervention effect on active coping strategies, rather than tapping into participants' rumination on previous adverse experiences. This potentially can explain the lack of an effect for both those high in 'hopelessness', as well as on avoidance coping strategies.

In assessing the functional relationship between victimisation and alcohol-misuse, this thesis utilised a framework of comorbidity that has been suggested between PTSD and

alcohol-misuse (e.g. Stewart & Conrod, 2003). However, as indicated within the general introduction of this thesis, other factors such as peer groups could account for this relationship. Victimised adolescents are more likely to befriend other marginalised or victimised youth (Salmivalli, Huttunen, & Lagerspetz, 1997), which could lead to prolonged victimisation, or an association with peers engaging in more risky behaviours, such as alcohol and substance-use. Future research should therefore investigate victims' peer networks to assess whether this has an effect on their risk for maladaptive coping strategies and subsequent alcohol-misuse.

With respect to the intervention analyses, further attention should be paid to personality specific effects in the reduction of both victimisation and associated behavioural consequences. Due to a lack of statistical power, the differences between personality groups for intervention effects on coping-drinking motives and alcohol-related problems were not able to be assessed within this thesis. The Preventure and Adventure trials have already been shown to reduce negative mental health outcomes (Castellanos & Conrod, 2006; O'Leary-Barrett et al., submitted manuscript). It is important for the scope of these interventions to be assessed, specifically for their effects on victims of bullying, in order to examine whether or not these same trials can prevent against the adverse mental health outcomes already associated with school-based victimisation. If these interventions can be shown to positively prevent against mental health problems, this model may prove to be truly cost effective for British schools.

Whilst the intervention workshops for the main study analysed for this thesis (the Preventure study) were limited to those adolescents categorised as high-risk, the follow-on study, used to replicate findings in Chapters 4 and 7 of this thesis (the Adventure trial), implemented a whole-grade approach with respect to the surveys; all consented adolescents, whether high or low personality risk completed the follow-up surveys, with some teachers trained to deliver all four interventions. This strategy may have promoted a global increase in awareness and tolerance towards individual differences within the participating year-group, resulting in improved coping-skills and behaviours across all intervention groups, rather than restricted to a specifically vulnerable group. This strategy

is more in line with previous interventions that have successfully reduced victimisation using a whole-school approach (e.g. Olweus, 2005). The effect of the Adventure trial has already shown to be indirectly effective for 'low personality risk' students (who did not take part in the interventions) (Conrod et al., submitted manuscript). It would be interesting to assess the effect of the interventions specifically for low personality risk victims of bullying.

Finally, previous research has implicated the role of genetic differences in the risk for emotional difficulties from bullying victimisation (Sugden et al., 2010). Additionally, further studies have implicated genetics in the relationship between trauma-exposure and alcohol-misuse (e.g. Blomeyer et al., 2008). Whilst genetic investigations are beyond the scope of this thesis, this is an important factor for future studies to investigate in order to gain a holistic understanding of the functional relationship between bullying victimisation and alcohol-misuse.



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## **APPENDICES**

Appendix I: Publications and Conference Presentations

Appendix II: The Substance Use Risk Profile Scale

Appendix III: The Coping Strategies Questionnaire

Appendix IV: The Drinking Motives Questionnaire

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Appendix XIV: IMAGEN Project: Student Assent Form

Appendix XV: IMAGEN Project: Parental Consent Form

## **APPENDIX I:**

### **PUBLICATIONS AND CONFERENCE PRESENTATIONS RELATED TO THIS THESIS**

Topper, L., Castellanos-Ryan, N., Mackie, C., & Conrod, P.J. (2011). Adolescent bullying victimisation and alcohol-related problem behaviour mediated by coping-drinking motives over a 12 month period. *Addictive Behaviors*, 36, 6-13.

Topper, L., & Conrod, P.J. (in press). A review of the association between alcohol-misuse and bullying victimisation in adolescence. *Mind & Brain, Journal of Psychiatry*.

Topper, L., Castellanos-Ryan, N., O'Leary-Barrett, M., & Conrod, P.J. (2011). The effect of personality-targeted interventions on coping motives for drinking for victims of adolescent bullying. *Presented as part of a symposium at the 2011 Research Society on Alcoholism, Atlanta, USA*.

Topper, L., Castellanos-Ryan, N., & Conrod, P.J. (2010). The effect of personality-targeted interventions on alcohol-related problems for victims of adolescent bullying. *Presented as part of a symposium at the Sixth World Conference on the Promotion of Mental Health and Prevention of Mental and Behavioral Disorders, Washington, DC*.

Topper, L., & Conrod, P.J (2010). Pathways of risk: Adolescent bullying victimisation and alcohol-related problem behaviour. *Presented at the 69th Alcohol Problems Research Symposium: Cumbria, England*.

Topper, L., Castellanos-Ryan, N., & Conrod, P.J (2010). Adolescent bullying victimisation: Risk pathways and intervention strategies. *Presented as a poster presentation at the 'Life History Research Society' conference, Montreal, Canada*.

Topper, L., Castellanos-Ryan, N., Mackie, C., & Conrod, P.J. (2009). Adolescent bullying victimisation and alcohol-related problem behaviour mediated by coping-drinking motives

over a 12 month period. *Presented as part of a symposium at the 2009 European Conference on Developmental Psychology.*

Topper, L., Castellanos-Ryan, N., Mackie, C., & Conrod, P.J. (2009). Adolescent bullying victimisation and the Quantity and Frequency of alcohol-use. *Presented as a poster presentation at the 2009 Research Society on Alcoholism, San Diego, CA.*

## APPENDIX II:

### THE SUBSTANCE USE RISK PROFILE SCALE (SURPS)

Please indicate the extent to which you agree with the following statements about yourself using the scale below.

1	2	3	4
Strongly Disagree	Disagree	Agree	Strongly Agree

I am content or satisfied (pleased) with life in general.

I often don't think things through before I speak.

I would like to skydive (parachute out of a plane).

I am happy.

I often involve myself in situations that I later regret being involved in.

I enjoy new and exciting experiences even if they are unconventional (out of the ordinary/different).

I have faith that my future holds great promise.

It's frightening to feel dizzy or faint.

I like doing things that frighten me a little.

It frightens me when I feel my heart beat change.

I usually act without stopping to think.

I would like to learn how to drive a motorcycle.

I feel proud of my accomplishments (achievements).

I get scared when I'm too nervous.

Generally, I am an impulsive person (a person who does things "on the spur of the moment", without thinking of what the consequences (outcome/result) will be).

I am interested in experience for its own sake, even if it is illegal.

I feel that I'm a failure.

I get scared when I experience unusual body sensations (feelings).

I would enjoy hiking (walking) long distances in wild and uninhabited territory.

I feel pleasant.

It scares me when I'm unable to focus on a task.

I feel I have to be crafty or manipulative (sneaky) to get what I want.

I am very enthusiastic (positive/excited) about my future.

### APPENDIX III: COPING STRATEGIES QUESTIONNAIRE

There are many ways to try to deal with problems. The items below ask what you normally do to cope with problems or particularly stressful moments in your life.

1	2	3	4
I haven't been doing this at all	I've been doing this a little bit	I have been doing this a medium amount	I have been doing this a lot

**Using the key above, how often in the last 6 months have you been doing the things stated below to deal with your problems:**

- I've been turning to work or other activities to take my mind off things.
- I've been concentrating my efforts on doing something about the situation I'm in.
- I've been saying to myself "this isn't real."
- I've been using alcohol or other drugs to make myself feel better.
- I've been getting emotional support from others.
- I've been giving up trying to deal with it.
- I've been taking action to try to make the situation better.
- I've been refusing to believe that it has happened.
- I've been saying things to let my unpleasant feelings escape.
- I've been getting help and advice from other people.
- I've been using alcohol or other drugs to help me get through it.
- I've been trying to see it in a different light, to make it seem more positive.
- I've been criticizing myself.
- I've been trying to come up with a strategy about what to do.
- I've been getting comfort and understanding from someone.
- I've been giving up the attempt to cope.
- I've been looking for something good in what is happening.
- I've been making jokes about it.
- I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
- I've been accepting the reality of the fact that it has happened.
- I've been expressing my negative feelings.
- I've been trying to find comfort in my religion or spiritual beliefs.
- I've been trying to get advice or help from other people about what to do.
- I've been learning to live with it.
- I've been thinking hard about what steps to take.
- I've been blaming myself for things that happened.
- I've been praying or meditating.
- I've been making fun of the situation.



#### APPENDIX IV:

#### DRINKING MOTIVES QUESTIONNAIRE (DMQ)

**If you drank alcohol in the past 6 months**, please indicate how often you drank for each of the following reasons, by ticking the appropriate box for each question.

**If you did not drink in the past 6 months**, then tick 1 or “**never**” for every question

**Please select your responses from the choices below:**

1	2	3	4	5
Almost Never / Never	Some of the Time	Half of the Time	Most of the Time	Almost Always / Always

To forget my worries

Because my friends pressure me to drink

Because it helps me to enjoy a party

Because it helps me when I feel depressed or nervous

To be sociable

To cheer up when I am in a bad mood

Because I like the feeling

So that others won't poke fun at me about not drinking

Because it's exciting

To get a buzz

Because it makes social gatherings more fun

To fit in with a group I like

Because it gives me a pleasant feeling

Because it improves parties and celebrations

Because I feel more self-confident and sure of myself

To celebrate a special occasion with friends

To forget about my problems

Because its fun

To be liked

So I won't feel left out

## APPENDIX V: BULLYING QUESTIONNAIRE

We say a student is **BEING BULLIED** when a student or group of students say or do nasty and unpleasant things to him or her. It is also bullying when a student is teased repeatedly in a way he or she does not like or when they are deliberately left out of things.

1	2	3	4	5
None	Only once or twice	2 or 3 times a month	About once a week	Several Times a week

Using the key above, how often have the following situations occurred in the past 6 months?

I was bullied at school

I was called mean names, was made fun of, or teased in a hurtful way

Other students left me out of things on purpose, excluded me from their group of friends or completely ignored me

I was hit, kicked, pushed shoved around, or locked indoors

I took part in bullying another student(s) at school

I called another student(s) mean names, made fun of, or teased him or her in a hurtful way

I kept him or her out of things on purpose, excluded him or her from my group of friends, or completely ignored him or her

I hit, kicked, pushed, shoved around or locked him or her indoors.

## APPENDIX VI:

### STRENGTHS AND DIFFICULTIES QUESTIONNAIRE

For each item in the following box, please mark on your answer sheet the box for Not True (A), Somewhat True (B), or Certainly True (C). It would help us if you answered all the items as best you can even if you are not absolutely certain or the items seem daft! Please give your answers on the basis of how things have been for you over the last six months.

A	B	C
Not True	Somewhat True	Certainly True
		I try to be nice to other people. I care about their feelings.
		I am restless. I cannot stay still for long.
		I get a lot of headaches, stomach-aches, or sickness.
		I usually share with others (food, games etc)
		I get very angry and often lose my temper
		I am usually on my own. I generally play alone or keep to myself.
		I usually do as I am told.
		I worry a lot.
		I am helpful if someone is hurt, upset, or feeling ill.
		I am constantly fidgeting or squirming.
		I have one good friend or more.
		I fight a lot. I can make other people do what I want.
		I am often unhappy, down-hearted, or tearful.
		Other people my age generally like me.
		I am easily distracted. I find it difficult to concentrate.
		I am nervous in new situations. I easily lose Confidence.
		I am kind to younger children.
		I am often accused of lying or cheating
		Often children or young people pick on me or bully me.
		I often volunteer to help others (parents, teachers, children).
		I think before I do things.
		I take things that are not mine from home, school or elsewhere.
		I get on better with adults than with people my own age.
		I have many fears. I am easily scared.
		I finish the work I am doing. My attention is good.
		I often forget things or make careless mistakes in school/work and other activities
		I worry about how well I do at school work.
		I feel bad or guilty when I do something wrong

**APPENDIX VII:**  
**THE RUTGERS ALCOHOL PROBLEM INDEX**

**Consequences of your drinking alcohol (past 6 months). Please select your responses from the choices below:**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
never	1-2 times	3-4 times	5-6 times	more than 6 times

**If you did not drink in the past 6 months, then tick 1 or “never” for every question**

Got into fights, acted bad, or did mean things

Caused shame or embarrassment to someone

Neglected my responsibilities

Noticed a change in my personality

Suddenly found myself in a place that I could not remember getting to

Had a fight, argument, or bad feelings with a friend

Felt I was going crazy

## APPENDIX VIII:

### PREVENTURE STUDY: PARTICIPANT ASSENT FORM (GENERAL SURVEYS)



Section of Addiction Research  
Division of Psychological Medicine  
Box 048  
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TEL: 020 7 848 0836  
FAX: 020 77018454  
p.conrod@iop.kcl.ac.uk  
j.strang@iop.kcl.ac.uk

**Research Project Title:** “Adolescent Student Survey”

Principal Investigators: Dr. Patricia Conrod and Dr. John Strang  
Phone Number: 0207 848 0836

Note: Students must read this form and sign the following page to confirm that they understand and accept conditions before the survey can begin.

---

To all students:

You are being invited to participate in a *research* project conducted by Patricia Conrod, Principal Investigator. The Research Ethics Committee of the Institute of Psychiatry, which has approved this project, requires that researchers using human subjects conform with ethical guidelines currently suggested by most professions and research granting agencies. These guidelines require:

- 1) That you be informed of the purpose of the research program and any attendant inconvenience, risk, or benefits.
- 2) That the character of the task required be explained to you.
- 3) That you be made aware that participation is voluntary and that you may decline to continue as a participant at any point during the course of the research project, without penalty.
- 4) That you be assured that all information assembled is entirely confidential.

Please read the following that provides these details about the current research project.

Purpose of the research project: The purpose of this survey has two parts: one part is to conduct a research study on gender (looking at differences among girls and boys). The second part is to screen for students who may be interested in another study that involves two small group sessions that will present information and strategies on how to deal with anxiety issues and risky behaviour, including risky behaviour involving alcohol.

Task requirements: As a participant, you will be asked to complete a questionnaire. The principal investigator will be conducting the survey and will be assisted by a trained research assistant(s). You will be asked to complete the survey during class time at school.

No students at your school will be excluded from participating in the survey. You will be asked to provide written indication of your interest in finding out more about another study which involves two small group sessions on how to deal with anxiety issues and/or risky behaviour, including risky behaviour involving alcohol. At the end of the class period, you will be asked to drop your survey in a box at the front of the class.

Hazards, risks, inconveniences, or benefits associated with participation:

There are circumstances under the law which require the researcher to disclose information, including when an adolescent indicates that he/she is in current danger of harming her/himself or others or being harmed by another. In cases where confidentiality must be broken, for example, should you indicate that you are in current danger of harming yourself or others or being harmed by another, the researcher will share this information with the appropriate school staff member.

Confidentiality: All of the information that you provide will remain confidential, with the exception of cases noted above. Your data will be identified only with a code number and not your name, and your questionnaire will be kept in a locked filing cabinet. Only the principal investigator alone will keep a master list linking questionnaire numbers with the names of students interested in finding out more about the small group sessions.

Please sign below to confirm that you understand the information provided above, and that you are aware that all information you provide will be treated with confidence, and that you may discontinue at any point in the study. Feel free to address any questions to the investigator either now or after you have participated.

In the event that you have any difficulties with, or wish to voice concern about any aspect of your participation in this study, you may contact Patricia Conrod or Professor John Strang, at the National Addiction Centre, 020 7848 0836. The privacy of each call will be ensured.

---

I \_\_\_\_\_ (student name) agree to take part in the study,

Student's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## APPENDIX IX:

### PREVENTURE STUDY: PARENTAL CONSENT FORM (GENERAL SURVEYS)



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p.conrod@iop.kcl.ac.uk  
j.strang@iop.kcl.ac.uk  
n.castellanos@iop.kcl.ac.uk

#### Student Survey Parental Consent Form

**Research Project Title:** Pre-venture: Personality Risk Education

**Principal Investigators:** Dr. Patricia Conrod and Dr. John Strang

**Phone Number:** 020 7848 0836

**Email:** p.conrod@iop.kcl.ac.uk

**Note:** Parents must read this form and contact us to confirm that they **DO NOT** want their children to participate in a survey at their school.

---

Dear Parent/Carer

Your child will be invited to participate in a *research* project. The purpose of this survey has two parts:

1. Looking at differences among girls and boys.
2. To screen for students who may be interested in another study that involves two small group sessions that will present information and strategies on how to deal with anxiety issues and risky behaviour, including risky behaviour involving alcohol.

#### The process:

1. The principal investigator will be conducting the survey and will be assisted by a trained research assistant(s). Your child will be asked to complete the survey during class time at school.
2. Student participation in this survey is purely voluntary.
3. Your child will be asked to provide written indication of their interest in learning more about another study which involves two small group sessions on how to deal with emotional issues and risky behaviours.
4. At the end of the class students will be asked to drop their survey in a box at the front of the class. We will ask for your signed consent for your child to participate in this second phase of the study.

#### Child protection issues:

There are circumstances under the law which require the researcher to disclose information to a responsible person at the school, including when an adolescent indicates that he/she is in current danger of harming her/himself or others or being harmed by another.

Confidentiality: All of the information that your child provides will be treated with confidence. Data will be identified only with a code number and not your child's name, and the questionnaire will be kept in a locked filing cabinet.

Please sign below if you DO NOT consent to your child participating in this survey and return this form to the school reception. Feel free to address any questions to the investigator either now or later.

If you want to speak with someone about this you may contact Patricia Conrod on 020 7848 0836. The privacy of each call will be ensured.

\_\_\_\_\_

I, \_\_\_\_\_ (your name) **DO NOT** agree to allow my child

\_\_\_\_\_ (child's name) to take part in this study.

Parent's Signature: \_\_\_\_\_ Date: \_\_\_\_\_



**APPENDIX X:  
PREVENTURE STUDY: STUDENT ASSENT FORM (INTERVENTION  
WORKSHOPS)**



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p.conrod@iop.kcl.ac.uk  
j.strang@iop.kcl.ac.uk

Note: Students must read this form and sign the following page to confirm that they understand and accept conditions before the groups can begin.

---

To students interested in participating in a group:

You are being invited to participate in a research project conducted by Dr. Patricia Conrod and Dr. John Strang. The Research Ethics Committee of the Institute of Psychiatry, King's College London, which has approved this project, requires that researchers using human subjects conform with ethical guidelines currently suggested by most professions and research granting agencies. These guidelines require:

- 5) You are told about the aim of the research program and any inconvenience, risk, or benefits in you taking part.
- 6) That the task you are asked to take part in is explained to you.
- 7) That you are aware that your participation is voluntary and that you may stop participating at any point during the course of the research project, without any negative consequences.
- 8) All of the information that you provide will be entirely confidential.

Please read the following that provides these details about the current research project.

Purpose of the research project: The purpose of this study is to conduct small group sessions that will present information and strategies on how to deal with anxiety issues and risky behaviour, including risky behaviour involving alcohol and to get your feedback on the groups.

Task requirements: As a participant, you may be invited to take part in group coping skills training sessions, which will be held at your school. We are trying out different combinations of groups involving personality characteristics and coping skill strategies. Four types of groups will be conducted, designed to help with anxiety problems and risky behaviors. Volunteers are needed to participate in these groups. You will either be assigned to a coping skills group or a control group. Those in the control group will not attend the group sessions in order for us to make comparisons between the groups and see whether the coping skill groups are helpful.

We are interested in testing the effectiveness of the coping skills training groups and various ways of organizing the groups based on personality characteristics. The groups will be facilitated by a trained therapist and research assistant. Each group session will be approximately 90 minutes long and your child will be asked to participate in two of them. You will also be asked to complete a survey (very much like the survey they completed for us previously), 3 months, 6 months, 12 months, 18 months and 2 years later. That means that we will be contacting you at regular intervals for 2 years, asking you to complete a questionnaire that takes no more than 45 minutes.

You do not have to complete these questionnaires if you do not wish to.

Hazards, risks, inconveniences, or benefits associated with participation: There are no anticipated hazards or risks associated with your participation. You may benefit from learning strategies to deal with anxiety, depression or/and situations involving alcohol.

Compensation: You will not be provided with compensation for your participation.

Confidentiality: All of the information that you provide will be treated with confidence. There are circumstances under the law which require the researcher to disclose information, including when an adolescent indicates that he/she is in current danger of harming her/himself or others or being harmed by another. In cases where confidentiality must be broken, for example, should you indicate that you are in current danger of harming yourself or others or being harmed by another, the researcher will share this information with the PHSE co-ordinator or child protection officer at your school.

Please sign below to confirm that you understand the information provided above, and that you are aware that all information you provide or that is revealed by other group members will be treated with the strictest of confidence, and that you may discontinue at any point in the study. Feel free to address any questions to the investigator either now or after you have participated.

**In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Dr. Patricia Conrod at 020 7848 0836. The privacy of each call will be ensured.**

---

I, \_\_\_\_\_ (Student Name) agree to participate in this study.

Student's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**APPENDIX XI:  
PREVENTURE STUDY: PARENTAL CONSENT FORM (INTERVENTION  
WORKSHOPS)**



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p.conrod@iop.kcl.ac.uk  
j.strang@iop.kcl.ac.uk  
n.castellanos@iop.kcl.ac.uk

**Coping Skills Group Study: Parent Authorization Form**

Note: Parents must read this form and sign the following page to confirm that they understand and accept conditions of their child's participation in a group study.

---

To parents:

Your child has been invited to participate in a research project conducted by Dr. Patricia Conrod and Dr. John Strang. The Research Ethics Committee of the Institute of Psychiatry, King's College London, which has approved this project, requires that researchers using human subjects conform to ethical guidelines currently suggested by most professions and research granting agencies. These guidelines require:

- 1) You are told about the aim of the research program and any inconvenience, risk, or benefits in your child taking part.
- 2) That the task your child is asked to take part in is explained to you.
- 3) That you be made aware that your child's participation is voluntary and that your child may decline to continue as a participant at any point during the course of the research project, without any negative consequences.
- 4) All of the information that your child provides will be entirely confidential.

Please read the following that provides these details about the research project:

Purpose of the research project: The purpose of this study is to conduct small group sessions with adolescents, providing them with relevant coping skills. These groups will present information and strategies on how to deal with anxiety, depression and risky behaviour.

Task requirements: As a participant, your child may be invited to take part in group coping skills training sessions, which will be held at your child's school. The groups will be facilitated by a trained therapist and research assistant. Each group session will be approximately 90 minutes long and your child will be asked to participate in two of them. Your child will also be asked to complete a survey (very much like the survey they

completed for us previously), 3 months, 6 months, 12 months, 18 months and 2 years later. That means that we will be contacting your child at regular intervals for 2 years, asking them to complete a questionnaire that takes no more than 45 minutes to complete.

Hazards, risks, inconveniences, or benefits associated with participation:

There are no anticipated hazards or risks associated with your child's participation. Your child may benefit from the coping strategies presented in the group sessions on how to deal with anxiety, depression and risky behaviour.

Confidentiality: All of the information that your child provides will be treated with confidence. There are circumstances under the law which requires the researcher to disclose information, including when an adolescent indicates that he/she is in current danger of harming her/himself or others or being harmed by another. In cases where confidentiality must be broken, for example, should your child indicate that they are in current danger of harming themselves, the researcher will share this information with school counselor, who will then share this information with you.

Please sign below to confirm that you understand the information provided above, and that you are aware that all information your child provides will be treated with the strictest of confidence, and that your child may discontinue at any point in the study. Feel free to address any questions you may have about this research project or about the procedures this study will follow to the principal investigator, Dr. Patricia Conrod (0207 848 0836). The privacy of each call will be ensured.

In the event that you have any difficulties with, or wish to voice concern about, any aspect of your child's participation in this study, you may contact Dr. Patricia Conrod or Dr. John Strang, at 0207 848 0836.

---

I give my permission for \_\_\_\_\_ (child's name) to participate in the research project at his/her high school.

Parent's name: \_\_\_\_\_ Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## APPENDIX XII: ADVENTURE STUDY: PARTICIPANT ASSENT FORM



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**TEL: 020 7 848 0836**  
**FAX: 020 77018454**  
**p.conrod@iop.kcl.ac.uk**  
**laura.sully@iop.kcl.ac.uk**

### Coping Skills Study

Name of Researcher: Dr Patricia Conrod (Ethics reference: CREC/06/07-192)

To student:

After reading the information sheet, if you wish to complete the survey and/or the coping skills workshops then please sign and complete this form. Please specify if it is the survey or intervention groups (or both) that you wish to participate in. **Please note: you can only participate in the coping skills group if you first complete the survey.**

Please sign below if you consent to participating in this study.

In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Dr Patricia Conrod on 020 7848 0836. The privacy of each call will be ensured.

**Please tick box**

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at anytime without giving any reason. ☐
3. I understand that all information I give is totally confidential. ☐
4. I understand that all information provided will be stored for 7 years in a secured locked cabinet at Kings College, as per College guidelines. ☐
5. I consent to the processing of my personal information for the purposes of this research study. I understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998. ☐
6. I agree to the research team having access to my school records. ☐
7. I agree **to take part** in the **survey only**. ☐
8. I agree **to take part** in the **survey** and the **coping skills workshop**. ☐

\_\_\_\_\_  
**Name of Child Participant**

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**School**

\_\_\_\_\_  
**Date**

**APPENDIX XIII:**  
**ADVENTURE STUDY: PARENTAL CONSENT FORM**



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**laura.sully@iop.kcl.ac.uk**

**Coping Skills Study**

Name of Researcher: Dr Patricia Conrod (Ethics Reference: CREC/06/07-192)

To parents:

After reading the information sheet, if you do **NOT** wish for your child to complete the survey and/or the coping skills workshops then please sign and complete this form. Please specify if it is the survey or intervention groups (or both) that you do not wish your child to participate in.

Please sign below if you **DO NOT** consent to your child participating in this study.

In the event that you have any difficulties with, or wish to voice concern about, any aspect of your child's participation in this study, you may contact Dr Patricia Conrod on 020 7848 0836. The privacy of each call will be ensured.

**Please tick**

1. I **DO NOT** give consent for my child to complete the survey for the above study.  
I understand that in order to receive the coping skills intervention, my child must first complete the survey. ☐
2. I **DO NOT** give consent for my child to participate in the coping skills intervention groups that will be run at their school as part of the above study. ☐
3. I **DO NOT** agree to the research team having access to my child's school records. ☐

\_\_\_\_\_  
**Name of Parent**

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**Name of Child Participant**

\_\_\_\_\_  
**School**

\_\_\_\_\_  
**Date**

**APPENDIX XIV:  
IMAGEN PROJECT: PARTICIPANT ASSENT FORM**

**CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES**

**Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.**

**Title of Study: IMAGEN STUDY**

**King's College Research Ethics Committee Ref: CREC/06/07-71**

- Thank you for considering to take part in this research. The person organizing the research must explain the project to you before you agree to take part.
- If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.
- I understand that if I decide at any other time during the research that I no longer wish to participate in this project, I can notify the researchers involved and be withdrawn from it immediately.
- I consent to the processing of my personal information for the purposes of this research study. I understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.
- I consent to having a sample of blood taken for research in the above project. I understand how the sample will be collected, that giving a sample for this research is voluntary and that I am free to withdraw my approval for use of the sample at any time without giving a reason and without my legal rights being affected

**Participant's Statement:**

I \_\_\_\_\_

agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information Sheet about the project, and understand what the research study involves.

**Signed**

**Date**

**Investigator's Statement:**

I \_\_\_\_\_

confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the volunteer.

**Signed**

**Date**

**Name**

**Date**

**Signature**

\_\_\_\_\_

**APPENDIX XV:  
IMAGEN PROJECT: PARENTAL CONSENT FORM**



**Institute of Psychiatry**  
Section of Addiction Research  
Division of Psychological Medicine  
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TEL: 020 7 848 0836/0967/0968  
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p.conrod@iop.kcl.ac.uk

**IMAGEN STUDY**

***Reward related behaviour in the normal brain and psychopathology***

**To participate in this research, read and sign this form. To consent to each aspect of the research, please initialize the boxes below. If you wish to opt out of a particular aspect of the research then do not initialize that box.**

1. I have read the attached information sheet on the above project, dated December 2007 (Ref. CREC/06/07-71), and have been given a copy to keep. I have had the opportunity to ask questions about the project and understand why the research is being done and any foreseeable risk s involved. ☐
2. I agree that my child will give a sample of blood for research in the above project. I understand how the sample will be collected, that giving a sample for this research is voluntary and that I am free to withdraw my approval for use of the sample at any time without giving a reason and without my legal rights being affected. ☐
3. I understand that I will be informed if any of the results of the medical tests done as a part of the research are important for my child's health and that a newsletter will say whether any research results obtained in this study may be of interest to participants. ☐
4. I agree that my child and I should be informed about any adventitious findings occurring during the study. I understand however that this is a scientific and not a medical investigation and thus there is no guarantee that abnormalities will be detected. ☐
5. I understand that I or my child will not benefit financially if this research leads to the development of a new treatment or medical test. ☐
6. I understand that the material that my child has donated for this study may be made available to Researchers at other centres that are carrying out similar work. ☐
7. I understand that if my child decides at any time during the research that they no longer wish to participate in this project, they can notify the researchers involved and be withdrawn from it immediately. ☐
8. I agree to be contacted for future studies ☐
9. I know how to contact the research team if I need to. ☐

**Name**

**Date**

**Signature**