Delusional thinking in violent offending:

Implications for risk assessment and treatment.

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Thesis Abstract

The impact of delusional thinking on the violent behaviour of individuals with psychiatric diagnoses has been explored using a variety of investigative methods. The notion that delusions play a role in an individual's violent offending has been broadly upheld within the work of this thesis. The nature or function of delusions in this process appears to be affected by a range of mediating and moderating factors. The complexity of these was illustrated during the conduction of a case study.

Advances in the understanding of mental disorder as a continuum, alongside the developments of risk assessment and management approaches, seem to provide the potential for an optimum vantage point to formulate the true role of delusions in the cognitive process.

Future research should avoid utilising the overarching themes of psychiatric diagnoses or sets of symptoms to explore violence and should focus on considering the functions of individual symptoms or characteristics, as many of these overlap with other clinical and non-clinical populations.

Overview

The last three decades of research into the complex relationship between psychiatric diagnoses and violent offending has continued to produce a variety of conflicting findings. This has continued to be the case where the role or function of delusions in the act of violence has been considered.

This thesis aimed to clarify some of these issues by exploring delusional thinking and its contribution to the psychological processes which precede violence.

Chapter 1 systematically examined the association between delusions and violence across a wide range of psychiatric diagnoses. It concluded that delusions had a positive relationship with violent actions, but that it was likely that a number of specific moderating variables affected the trajectory of this connection. Chapter 2 then explored whether this relationship might present in a personality disordered population. The empirical study identified that those with the most severe presentations of personality disorder, or those with the most severe history of violence; had experienced higher levels of lifetime delusional thinking. The study has demonstrated weak to moderate, but significant intercorrelation between these variables. Chapter 3 investigated how delusions impacted upon the violence of an individual experiencing comorbid schizophrenia and personality disorder; identifying that these had a triggering effect on core beliefs and schemas, which in turn resulted in violent behaviour. Chapter 4 examined whether our best practice risk assessment approaches enable clinicians to duly consider the impact of individual symptoms.

Acknowledgements

"Cultivate the habit of being grateful for every good thing that comes to you, and to give thanks continuously. And because all things have contributed to your advancement, you should include all things in your gratitude."

— Ralph Waldo Emerson

I am indebted to my parents, partner and closest friends, who have patiently held my house and family together whilst my focus was elsewhere, their sense of pride driving me to succeed. To my son, Rene, who I hope will too, learn that hard work, dedication, reflection and acceptance of criticism will reward dividends.

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Introduction

Background

The outcome at the end of at least three decades, encompassing vast conceptual and cultural shifts, is that there still remains a lack of clarity surrounding the understanding of the connection between psychiatric disorders and violent behaviour.

Violent offenders are a heterogeneous group, giving rise to the wide variety of theories (social, genetic, evolutionary, cognitive, neurological, developmental etc.) which attempt to explain the range of violent offences committed by people every day. So why, have academics and practitioners alike, set out to comprehend violence by disorder, category, or group? No one theory or sole risk factor is ever likely to explain the complexities of an action taken by a person on any given occasion, nor a group, especially where an individual demonstrates belonging to more than one disorder, category, or group.

Advances are being made to gradually comprehend how a multitude of individual, familial and societal; static and dynamic; risk and protective factors interact. However, until this is further understood, digesting the colossal task of understanding violence, by containing the search for understanding to pockets may provide manageable, meaningful evidence.

If we could understand how even the majority of individuals within a collective are 'most likely' to respond or act then the accuracy of our 'predictions', our risk assessments and our professional decisions would be greatly enhanced. The impacts of achieving such an optimistic goal on the criminal justice, health and social care systems would be widespread. The commissioning and delivery of services in a strategically focussed way could reduce costs, provide targeted treatments more effectively and improve outcomes for individuals, carers and their communities.

From category to continuum

Figures of around 70% have been quoted as representative of the number of offenders in prison to have at least two comorbid mental health problems (Singleton *et al*., 1998). A systematic review of the prevalence of mental disorders in prison (Fazel & Danesh, 2002) identified that amongst male prisoners, around 15% suffered from psychotic or affective disorders and 65% personality disorders. Compared to the general population, these figures are about 14 times higher and reflect the well-established overlap of mental health issues and offending.

Importantly, whilst many offenders have mental health difficulties, the majority of people with mental health issues, despite being at a higher risk of doing so, do not go on to offend or act violently (Stuart, 2003). Conversely, they are known to be at an increased risk of victimisation (Walsh *et al.* 2003). Studies have repeatedly

reported that less than 10% of violent offences are committed by people with a serious mental illness (Walsh, Buchanan, & Fahy, 2002). However, studies reporting this tend not to consider the contribution of personality disorder. This highlights the importance of understanding exactly which aspects of mental illness or disorder, or combinations of co-occurring risk factors, lead this minority of people with mental health difficulties to offend or act in aggressive and threatening ways. Similarly, it raises the question, if around 10% of violent offences are committed by people with a mental illness, how is their violent behaviour differentiated, or not, from the other 90%, who possibly include a large proportion of personality disordered individuals? Is it that their violent behaviour is more severe and that is why the prevalence of mentally ill/disordered offenders in the prison population is so high?

The myth, or public perception, that all mentally ill people are violent has vehemently been dispelled in recent years (Stuart, 2003). This has been concurrent with personality disorder stealing the limelight with regards to 'dangerousness' (Powis, 2002). However, comorbidity of psychiatric disorders and an increasingly accepted continuum approach (Moller, 2003; Moreno De Luca *et al.,* 2013) to the complexity of symptoms and characteristics, complicate further attempts to understand violent behaviour by diagnosis. This heightens the need for epidemiological research to target the

processes within, and interactions between, symptoms, characteristics and behaviour instead.

Cognitive rationales for violence by offenders with mental health difficulties

Neuropsychological research investigating the frontal lobe activity and executive functioning of those with psychotic disorders or personality disorders has long since provided evidence that a variety of pronounced deficits exist in these populations and amongst offenders more broadly (Berlin, Rolls, & Iversen, 2005; Brower & Price, 2001). The origin of the deficit could be central to the diagnosis itself, or a by-product of coexisting factors such as substance misuse or acquired/traumatic brain injury. However, the level of impulsivity present in individuals with this type of dysfunction has been used to partially explain how the cognitive processes involved in the prelude to violent acts and the motor control during such behaviour, are affected (Schuermann *et al*., 2011). Impulsivity of thought, affect, and urges to act constitutes biased social information processing, emotion dysregulation and reactive behaviour. High levels of impulsivity, therefore, affect the ability to make rational decisions, to problem solve and plan pro-social solutions to conflict (De Brito *et al.,* 2013), all important components for inhibiting violent behaviour.

Cognitive processes are also affected by an individual's schemas (Young, 1994) and core beliefs (Beck, Rush, & Shaw, 1979). For

those with mental health difficulties, especially the high proportion of whom have experienced difficulty with attachment, trauma and abuse (Maxfield & Widom, 1996), are negatively toned and contextually maladaptive. This developmental bias towards processing potentially neutral information negatively, or negative information in a magnified manner, leads to processes such as negative automatic thoughts and dysfunctional assumptions (Escobar *et al.*, 2013). These, in turn, increase the likelihood that an individual may become involved in conflict and subsequently experience excessive negative arousal and possibly act aggressively as a result. This core process could be detrimental, but when further symptomatology is contributing and embroiled in a person's everyday functioning, the outlook is even less optimistic.

This thesis aims to investigate the contribution of delusional thinking to the cognitive processes involved in the prelude to violent behaviour. It will do this by first systematically examining the evidence for and against delusions having any association with aggressive and violent behaviour. Then, an empirical study will examine whether delusional thinking is prevalent in a varied, forensic, personality disordered population. Then whether any such presence is associated with the severity of the personality disorder, or the violence within the population. The experience of delusional thinking and its impact on violent behaviour within an individual case will provide insight into the covariate factors which may influence the

role of the delusion itself. Finally, the thesis will critically examine one of the most popular violence risk assessment and management tools designed for mentally disordered offenders in the current climate and consider whether its newest version is well equipped to enhance our practice in the coming years.

Chapter 1

An Examination of the Relationship between 'Delusions' and Violent Behaviour: A Systematic Review

1.1 Abstract

This document provides a systematic review of studies exploring the association between delusions and violent behaviour. PsychINFO, MEDLINE, EMBASE, AMED, BNI, CINAHL, NCJRS and Web of Knowledge electronic databases were searched to identify studies published between 1990 and August 2013 that reported on the relationship between such experiences and actions. A wide range of search terms for 'delusions' and a relatively narrow definition of 'violence' were used and 32 papers were included for analysis. Results suggest there is valuable evidence for a positive association between the experience of delusions and acting violently across a range of populations. It is anticipated that both mediating and moderating influences affect the texture of this relationship and explain the changeability in the findings from research to date. Persecutory and threat related beliefs more commonly demonstrate a connection with violence, potentially through the forum of the emotive response resulting from the experience of the delusion. Moving forward, research could explore whether encountering confirmatory or challenging evidence for the belief, results in the same level of affect regardless of the conviction with which the belief is currently held. Studies should perhaps seek to investigate whether gender moderates the association and possibly explains some of the mixed findings over time. It would be useful to broaden the clinical populations within which delusional thinking is examined.

1.2 Introduction

1.2.1 Background

An array of research has repeatedly produced mixed results, ultimately demonstrating that a wide range of psychiatric disorders have connections with a range of aggressive and violent behaviours. Disorders such as schizophrenia (Belli & Ural, 2012), substance misuse disorder (Scott *et al.*, 1998; Soyka, 2000), personality disorders (PD; Glenn, Johnson, & Raine, 2013), post-traumatic stress disorder (PTSD; MacManus *et al*., 2013), major mood disorders (Rihmer *et al*., 2010) and dementia (Isaksson *et al.,* 2011) have all been linked to a plethora of problematic and violent actions. There are symptoms quite specific (but not exclusive) to each diagnosis which may account partially for the relationships of these disorders to violence i.e. command hallucinations in schizophrenia, (McNeil, Eisner & Binder, 2000). However, there is a greater amount of overlap in clinical presentations with contributory factors to violence common across diagnoses (i.e. dissociation as a risk factor for violence is common in PTSD, Fehon, Grilo & Lipschitz, 2005) without actual comorbidity (Mozkowitz, 2004). Therefore, symptoms are often considered in combination when trying to understand the risk a person with a particular diagnosis may pose.

Psychotic symptoms, as a cluster of experiences, are known to occur not only in psychotic disorders, but also depression (Crebbin *et al.*,

2008), PTSD (Lecomte *et al*., 2013), PD (Lechner *et al*., 2013) and dementia (Scarmeas *et al*., 2005). More recently, as part of the continuum model, it has been argued that the general population are bothered by a level of psychotic-like experiences (Motjabai, 2006).

Perhaps research needs to focus further on exploring the links individual symptoms have with violent behaviour. However, instead of concentrating on the link the symptom may have to certain diagnoses and thus the diagnosis to violence, perhaps the question is do people experience these symptoms in the same way across diagnoses? What function or consequence do they have? Do certain symptoms associate with, or drive violent behaviour in the same way regardless of diagnosis? What covariates may deflect the trajectory of the experience?

Douglas, Guy & Hart (2009) concluded from their meta-analysis of the association between psychosis and violence that psychosis was reliably associated with a 49-68% increased likelihood of violence, but that a variety of factors moderated this relationship. They suggest that future research should focus on which particular psychotic symptoms, and in which combination, are associated with an increased or decreased risk for which types of violence.

Despite mixed findings from studies on the psychosis-violence relationship (see Large & Nielssen, 2011 for a review), research into psychotic symptoms in schizophrenic populations has long established that positive symptom experiences are more significant

risk factors for violence than negative symptoms (Krakowski & Czobor, 1997; Nolan *et al*, 2005). Some research has even suggested that negative symptom experience is protective (Swanson *et al*, 2006), reducing the risk of serious violence. However, not all research supports the view that certain positive symptoms moderate the relationship between psychosis and violence (Rogers *et al*., 2002). Indeed, Hodelet (2001) found that the association was not strengthened by hallucinations or delusions.

Delusional beliefs are an example of a psychotic symptom found in a number of psychiatric diagnoses (Freeman *et al*., 2007) and believed by some to motivate violent behaviour (Beck, 2004), and serious violence in particular (Junginger, Parks-Levy, & McGuire, 1998).

Delusions are defined by the DSM-V (2013) as:

> *"….fixed beliefs that are not amenable to change in light of conflicting evidence. Their content may include a variety of themes (e.g. persecutory, referential, somatic, religious, grandiose)… Delusions are deemed bizarre if they are clearly implausible and not understandable to same-culture peers and do not derive from ordinary life experiences … The distinction between a delusion and a strongly held idea is sometimes difficult to make and depends in part on the degree of conviction with which the belief is held despite clear or reasonable contradictory evidence regarding its veracity." (pp.87).*

Many of the studies considered in this systematic review would have diagnosed, measured or categorised delusions according to the DSM-IV, possibly even the DSM-III-R. Whilst the advances in the definition over time have been minimal, the application of the definition, however, may have varied.

Violence is defined by the Violence Prevention Alliance as "*the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation*." (p.5, World Health Organisation, WHO 2013). This definition from the WHO has been utilised in this review with the exception of "*against oneself*". Verbal aggression and hostility not amounting to threats with the intention to cause harm, have not been included within the definition of violence.

1.2.2 Aims and Objectives

A number of systematic reviews and meta-analyses have more broadly sought to understand the relationship of psychosis, or schizophrenia and violence (Fazel *et al.,* 2009; Large & Nielssen, 2011; Witt, van Dorn & Fazel, 2013). However, there did not appear to be a prior review, systematic in approach, which detailed the association between specifically delusions and violence. Bjorkly (2002) did conducted a literature search of delusions and violence utilising two databases (MEDLINE and PsychLIT, 1967-2000)

however, the search strategy applied was limited to a handful of terms. Freeman, Garety, & Kuipers (2001) detailed a model of theoretical integration after reviewing the literature specifically on persecutory delusions, but did not consider a link with violence. Neither was a review found which detailed the prevalence or importance of delusions across other psychiatric diagnoses.

Given the understanding so far, that delusions play at least a partial role in violent behaviour, for some individuals, and an acknowledgement that delusions occur frequently across a range of diagnoses and in the general population, it is important to try to further understand this relationship. Adequate risk assessments and management plans rely on professionals to have the best evidence base for understanding a client's previous behaviour. Equally, the quality of risk assessment tools to help structure this process, depend upon a greater understanding of the relevance of risk factors, such as delusional thinking, to an individual's future behaviour. Treatment programmes for the reduction of offending behaviour hinge upon accurate formulations of the impact of all the risk factors independently and the consequence of the risk factors interacting.

Further understanding the role of delusional experiences, regardless of psychiatric diagnosis could have numerous benefits. It could help to make risk assessments and legal decision making more accurate, management plans more detailed and treatment programmes more effective across both criminal justice and healthcare provisions. A

review of the literature and the research conducted in this field should identify where knowledge is lacking and inform the direction of future research.

This systematic review aims to collate the highest quality research in this domain and decipher the inconsistencies previously found. It will explore whether delusions are positively, negatively, or indeed not at all associated with violence and consider the potential mediating roles of delusional distress or preoccupation with a belief. It will also seek to clarify whether a particular type of delusion is responsible for any effect; and if findings extend across psychiatric diagnoses other than just psychosis and schizophrenia.

1.3 Methods

1.3.1 Search Strategies

Studies that were indexed across 9 electronic databases were sought. PsychINFO, MEDLINE, EMBASE, AMED, BNI, ASSIA, CINAHL, NCJRS and Web of Knowledge were searched systematically to identify studies published between 1990 and August 2013. Studies published 1990 onwards generally include data from 1985 and later. Data collected prior to this would have been less comparable due to conceptual changes in our understanding of delusions (and other symptomology) over time.

This systematic review encompassed a comprehensive search strategy (See Appendix A) to capture a wide variety of delusions and known delusional syndromes/disorders (E.g. Capgras, fregoli, erotomanic) and violence related terms (i.e. hostility and assault). Electronic searches were based on key word terms and the appropriate truncation was used as per database requirements. The reference lists of each paper obtained in full were hand searched, irrespective of whether the paper was subsequently included in the review, to identify additional papers. Twelve were added in for consideration. Two authors (Bjorkly, S. & Guy, L.) were contacted to seek clarification on their reviews and to ensure all their included and excluded papers were given due consideration. At this point four more papers were added. At the final stage, one more paper was added after a search for recent (post electronic search) publications.

1.3.2 Study selection

Inclusion Criteria (See Table.1 For PICO)

Studies were included if: (a) the population was adult (aged eighteen or older) males, females, or mixed male and female; (b) they measured delusions, generically or by type; (c) aimed to assess the association, relationship or link between the delusions measured and (d) violence/aggression, including a wide range of behaviours from hostility to extreme violence.

Table.1 PICO for systematic review strategy

PICO	
Population	Adult Males, Females or Mixed Male/Female, Aged 18+
Intervention	Who have experienced delusions (or synonyms)
Comparator	Associated (or synonyms) or not WITH
Outcome	Violent (or synonyms) behaviour

The terms 'psychosis' or 'schizophrenia', or similar, were intentionally not included in the search strategy (Appendix A) as the review sought to explore papers that had examined the prevalence of delusions in a wide range of populations (E.g. non clinical samples, dementia, obsessive compulsive disorder etc.) as well as those including schizophrenia. At this stage, methodology within studies was not specified and all designs were included to enable the gathering of a breadth of information.

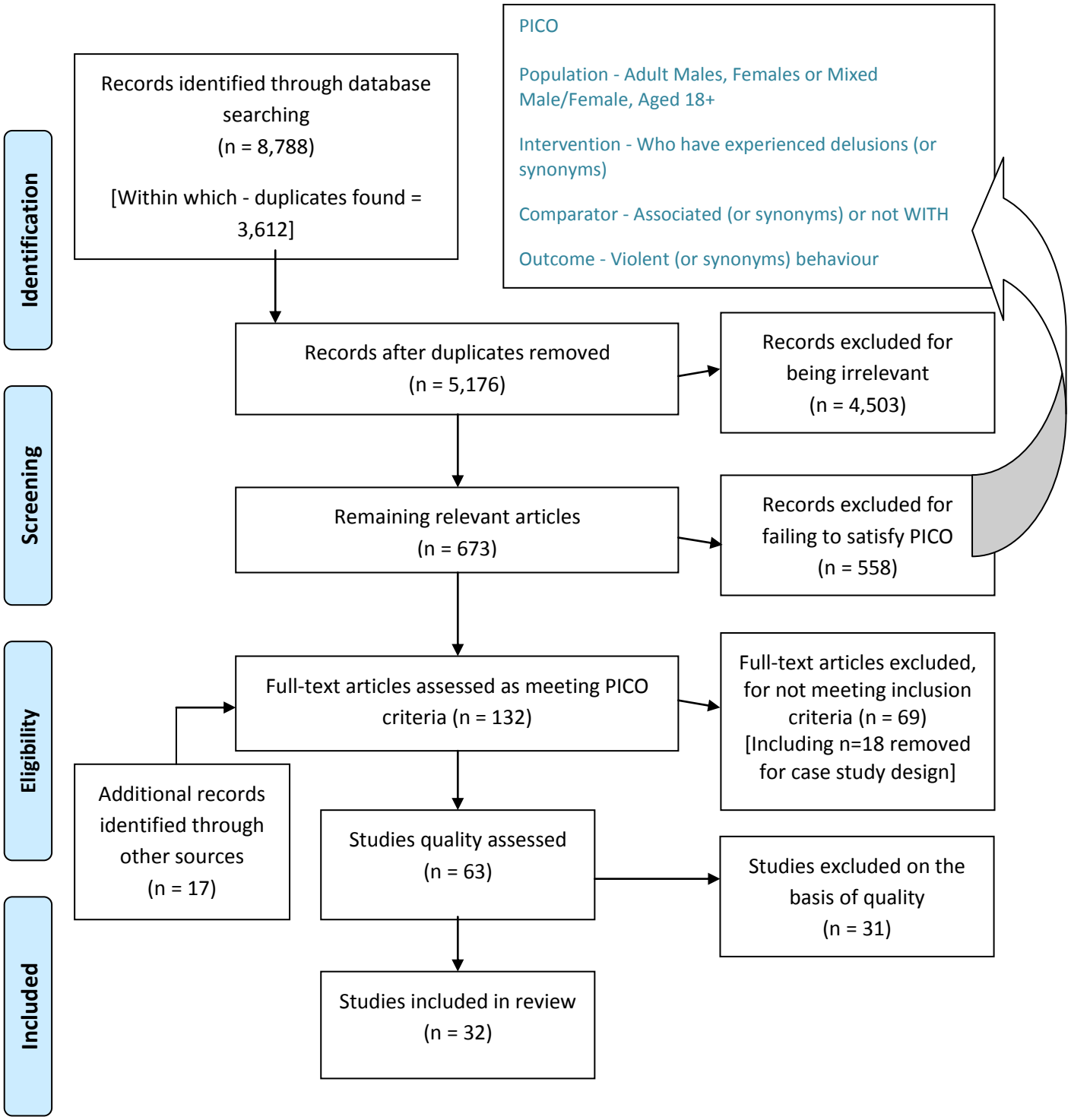
1.3.3 Quality Assessment

(See Figure 1 p.28 for flowchart of study selection process)

All references were managed using Endnote X4 software. There were a total of 8,788 citations identified and exported into Endnote after computing all necessary combinations within the search strategy of key words across the stated databases [Psychinfo = 2,560; Embase = 2,818; Medline = 779; CINAHL = 357 BNI = 0; ASSIA = 279; Web of knowledge = 1,546; NCJRS = 434]. The title and abstract of each citation identified were independently inspected to identify duplicates and studies that were not clearly relevant to the inclusion criteria. At this stage, 3,612 duplicate citations were removed (leaving 5,176 remaining) and 4,503 citations were excluded (resulting in 673 citations) on the basis of not being relevant despite having matched the search terms. Common themes within the papers excluded at this stage were: religion and violence, all-encompassing predictors of violence, mental illness broadly and violence, and adolescents, substance use and aggression.

At the end of this screening process, consideration of eligibility began. The PICO was applied to all 673 citations and 558 were deemed not eligible. The citations were stored in Endnote alphabetically and those being excluded were stored in a separate library/file. This library of exclusions as well as that of the included citations was checked a second time to ensure consistency of PICO

Figure.1 Flowchart of the study inclusion and exclusion process



Reference for Figure format: Moher, D., Liberati, A., Tetzlaff, J., Altman D.G., The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(6): e1000097.

application and to counter reviewer fatigue in the process of viewing vast numbers of abstracts. These excluded papers pertained to topics such as exploring obsessive compulsive disorder symptomology and aggression, stalking and violence, and dementia and agitation.

At this stage, 17 studies were added into the process, from the aforementioned hand searching and contacting experts in the field. This resulted in a total remaining 132 papers being accessed in full text for quality assessment processes to be applied. They were independently read by two reviewers who decided whether the inclusion criteria had been met. Both reviewers were studying Forensic Psychology at Doctoral level, had a number of years clinical experience in the field of forensic mental health; and had developed knowledge and experience of conducting quality, publishable research. Neither of the reviewers received payment or funding from any institution for the project.

A quality assessment proforma developed for the review (See Appendix B) was used to summarise key aspects of the studies. This was crucial for decision making, ensuring both reviewers were drawn to and checked the same information. Any differences of opinion were resolved by consensus and a third reviewer with similar experience to the other reviewers, gave their opinion where agreement could not be reached. Full papers were accessed in a variety of ways, but by chance, they were all English language and none needed translation.

During this stage it became apparent that not having any parameters for study design within the inclusion criteria was likely to leave the resulting studies unmanageable and incomparable. On the basis that "*it is permissible to edit and adapt the protocol as you carry out the review, to make it more instructive and/or functional*" (p.3, Denison *et al*., 2013). The reviewers decided to reconsider the inclusion criteria. It was decided that case studies and studies of a case series (*n= 18*) design were to be excluded. This was consistently applied by reassessing all 132 papers. At the end of this process 69 papers were removed, which constituted the 18 excluded because of design and 51 papers which had appeared to meet the PICO, but upon reading the full text, did not. For example, studies whereby the abstract discussed the potential relationship between delusions and violence, but then measured psychotic symptoms broadly as opposed to delusions. Removing the case studies/series did rule out a number of interesting and valuable qualitative papers exploring the rarer forms of delusions and the proposed impact of these on violent behaviour. However, the size and lack of analysis within the studies meant it was necessary to remove them to answer the research question proposed by making the resulting data and number of papers feasible for comprehensible and meaningful comparisons.

The final 63 were assessed for quality, or risk of bias. Studies were excluded if they (a) did not clearly define, categorise or measure delusions (n=14) or (b) violence (n=10), (c) if the examination of

the association between delusions and violence was not high on the studies agenda i.e. it was a tertiary aim (n=8), (d) if the study examined the relationship between delusions and violence as a key objective, but also included a wide range of other variables, often utilising more generic measurement tools (n=5), (e) if the analysis was limited to prevalence and did not include an exploration of correlations and/or regression (n=3), and (f) if the overall quality of the study, or the reporting of it were deemed less than adequate i.e. key information was absent or there were inconsistencies (n=1). Details of the studies excluded at the final stage are available in Appendix C (Table of excluded studies). Some studies were excluded for more than one of the above reasons.

There is no single validated approach to quality assessment that is suitable for all systematic reviews (Denison *et al*., 2013). Reviewers did not use a structured tool, other than the data extraction proforma (Appendix B), but rather made joint judgments regarding whether a study had reached a reasonable quality threshold. Decisions about whether the measurement or definition of delusions or violence was adequate, were made based on consideration of some of the following: whether well-known definitions or frameworks had been referred to, whether assessors were clinicians and whether they had used a validated tool or whether or not more than one source of assessment had been used. Some study designs were considered higher quality than others i.e. prospective as opposed to

retrospective, but studies were not excluded for having a less ideal methodology, only where the analysis appeared inadequate for the available possibilities.

1.3.4 Data extraction

The smallest accepted sample was *n*=39, although two thirds of the included studies were *n*=>100. Sample size, primary and secondary objectives, setting and population characteristics were extracted, with attention being given to the source (psychiatrist/other) of diagnostic assessment for clinical groups (i.e. DSM-III, DSM-IV, ICD-10). Subsequently, the definition and measurement of delusions and violence within the study were sourced, detailing the standardised tools used, the variety of collateral information and any sub type or category used. Demographic data (age, gender and ethnicity) and statistical analyses procedures were drawn out, along with the results. Similarities and differences between clinical and control, or sub groups of delusions and/or violence were explored and then the correlations and their level of significance were captured, as were the role that delusions played in models of regression.

Data was then synthesised and narratively reported based upon three main findings: a) studies which found a positive association, b) studies which did not find an association and c) studies which identified a negative association between delusions and violence. Although no formal weightings were provided to identify retained studies as higher or lower quality, the information which indicates

quality is provided in the respective tables and is discussed in the narrative synthesis of the findings.

Despite narrowing the accepted study design, the range of approaches to methodology rendered data not suitable for meta-analysis.

"*If studies are clinically diverse then a meta-analysis may be meaningless, and genuine differences in effects may be obscured…..Further, it is important not to combine outcomes that are too diverse……meta-analyses in the presence of serious publication and/or reporting biases are likely to produce an inappropriate summary*." (p. 9.4 Cochrane Handbook, Higgins & Green, 2011).

With a primary aim of the review being to examine the potential association between delusions and violence across clinical and non-clinical populations, there was inevitably clinical diversity amongst the retained studies. Similarly, whilst the definition of delusion was narrow, the nature of the breadth of the term violence meant a number of behaviours ranging in severity were captured within this outcome. Although a thorough risk of bias assessment was conducted and the remaining studies were of good quality, there were a large proportion of studies finding a significant association as compared to no association. One possible explanation for this is that it relates to a publication bias. Whilst it would have been desirable to attempt to configure the data for meta-analysis, this would have

been more appropriate had the studies been even more stringently quality assessed and the resulting studies been more comparable.

1.4 Results

1.4.1 Study Characteristics

There were 32 eligible studies reporting on 19,120 individuals. The overwhelming majority (66%) had purely psychotic or schizophrenic populations. Of these, 10 were from general psychiatric populations (Studies 2, 4, 5, 6, 15, 19, 20, 27, 31, and 32); nine included only forensic psychiatric samples (Studies 3, 11, 12, 14, 16, 21, 23, 24, and 26); and two had a mixture of forensic and general psychiatric participants (Studies 22 and 28). One study had both schizophrenic and non-clinical groups (Study 29). Five examined purely the general population (Studies 17, 18, 25, 29, and 30) and five studies explored geriatric populations with Alzheimer's and dementia (Studies 1, 7, 9, 10, and 13).

The mean age, standard deviation and gender of the participants in each of the studies is detailed in Table 1. The overall mean age (based on 25 studies which reported a mean) is 40.8 (range = 16-89). There was a wide range of means due to some studies examining geriatric populations. The mean sample size was 742.1 (range = 39 - 10,066; mean with outlier excluded = 441.3; median = 147); with 62.5% of the studies having greater than 100 participants. Seventy one percent of the studies were prospective in design and overall a range of correlation, cohort and case control

Table 2. Descriptive Characteristics of Included Studies

Study No:	Authors	N	Type of Study	Aim	Population (Country)	Gender	Age in Years (S.D.)
1	Aarsland *et al* (1996)	75	Prospective Correlational	Explore the relationship between neuropsychiatric symptoms and aggression	Patients with Alzheimers Disease (AD) (USA)	50.7% M 49.3% F	Mean = 75.2 Range 52-89
2	Appelbaum, Robbins, & Monahan (2000)	1,136	Prospective Cohort	Explore relationship between delusions and violence	Psychiatric patients discharged from hospital (USA)	58.7 % M 41.3% F	25-40 range
3	Bjorkly & Havik (2003)	39	Retrospective Cross sectional	Examine the presence of TCO as compared to other delusions	Patients with serious Mental Illness and history of violent offending (Norway)	74.4% M 25.6% F	Mean = 31.4 (11.2); Range 16-66
4	Buchanan *et al* (1993)	79 (Same pot as Wessely 1993 paper)	Prospective Epidemiological study	Identify phenomenological characteristics of delusions which are associated with action. Compared 'people who act' with 'people who do not act'.	Patients from general psychiatric wards who have at least one delusion (UK)	55% M 45% F	Mean = 33
5	Cheung *et al.* (1997)	50	Prospective Case control	Examine relationship between hallucinations/delusions and violence. Compared violent with non-violent schizophrenics	Long-stay inpatients with schizophrenia (Australia)	64% M 36% F	Violent Mean = 37.9 (7.2); Non-violent Mean = 37.8 (10.4)
6	Coid *et al*. (2013)	458	Prospective Epidemiological	Investigate which delusions beliefs are associated with violent behaviour during first episode psychosis.	Individuals with first episode psychosis who made contact with mental health services	61% M 39% F	18-64 range Mean =

			survey	Mediated by affect associated with delusions	(forensic service and prisons) (UK)		30.7(10.1)
7	Deutsch *et al.* (1991)	181	Prospective Epidemiological study	Determine frequency and type of psychotic symptoms in patients with Alzheimer's disease (AD) and test the relationship between specific symptoms and physical aggression	AD patients at John Hopkins University (USA)	34.7% M 65.3% F	Mean = 65.8 (8.3)
8	Fanning, Berman, Mohn & McCloskey (2011)	120	Prospective Correlational	Determine if psychosis-proneness is related to aggression and if one or both aspects of TCO mediate this relationship	Undergraduate students (USA)	50% M 50% F	Mean = 20.0 (3.0)
9	Gilley, Wilson, Beckett, & Evans (1997)	270	Prospective Epidemiological	Relationship between psychotic symptoms and subsequent aggressive behaviour	Eligible Alzheimer's outpatients (USA)	42% M 58% F	Mean = 72.9 (7.6)
10	Gormley, Rizwan & Lovestone (1997)	70	Retrospective Correlational	Examined the level and clinical correlates of aggressive behaviour in patients with Alzheimers disease (AD) by comparing aggressive ad non aggressive AD patients	Inpatients and outpatients of the Old Age Psychiatry Service, NHS in Kent (UK)	36% M 64% F	Mean = 78 (6.7)
11	Hodgins, Hiscoke, & Freese (2003)	128	Prospective Correlational	Examined the association between symptoms and aggressive behaviour	Patients with Schizophrenia/Schizoaffective disorder being discharged from hospital detention (Canada, Finland, Germany and Sweden)	100% M	Mean = 39.04 (11.31)
12	Hodgins & Riaz (2011)	251	Prospective Correlational	Tested the hypothesis that among patients with schizophrenia, the risk and correlates of aggressive behaviour would differ depending on	Patients with Schizophrenia/Schizoaffective disorder being discharged from hospital detention (Canada, Finland, Germany,	84% M 16% F	Mean 37.8 (11.4)

				the level of positive symptoms	Sweden and UK)		
13	Hwang, Tsai, Yang, Liu & Lirng (1999)	167	Prospective Epidemiological study	Investigate the prevalence, characteristics and associated factors of persecutory delusions	Various types of Alzheimers Disease patients from psychogeriatric ward at Veterans General Hospital (Taipei)	With Delusions 73% M 27% F Without Delusions 69% M 31% F	With Delusions Mean = 75.0 (7.1) Without Delusions Mean = 73.6 (6.1)
14	Keers *et al* (2013)	967	Cohort	Investigate whether psychosis increased the risk of violent behaviour among released prisoners and whether treatment reduced this risk. They also explored whether active symptoms of psychosis at the time of violent behaviour explained associations between untreated psychosis and violence.	UK Prisoner Cohort Study including male and female offenders who had been sentenced to more than two years for sexual or violent offences (UK)	81.4% M 18.6% F	Mean = 30.9 (11.6)
15	Koen *et al.* (2004)	70	Cohort	Investigate the role of previously identified non genetic risk factors in the manifestation of violent behaviour. Compared violent and non violent Schizophrenics.	Schizophrenic patients from an acute admissions ward in a Cape Town General Hospital (South Africa)	100% M	Not recorded
16	Laajasalo & Hakkanen (2006)	125	Mixed methods	Explore association between psychotic symptomology and excessive violence	Schizophrenic homicide offenders (Finland)	90.4% M 9.6% F	Mean = 35.6 (11.5) 18-69 range
17	Link, Stueve, & Phelan (1998)	2,678	Epidemiological Cohort	To assess the association between TCO and violence and determine if threat or control/override predominates	Israeli born Jews screened with psychiatric tool (Israel)		24-33 range

18	Link *et al.* (1999)	2,678	Epidemiological Cohort	Attempted to explain the link between mental illness and violence using TCO	Israeli born Jews screened with psychiatric tool (Israel)		24-33 range
19	Milton *et al.* (2001)	166		Examined acts of aggression in first episode psychosis	Patients with psychosis making their first contact with services in Nottingham (UK)	Not specified	Range 16-64
20	Nederlof (2011)	124	Cross Sectional	Examined whether TCO and emotional reactions to positive symptoms are related to aggressive behaviour	Psychiatric inpatients from 3 hospitals with Schizophrenia, Schizoaffective, Delusional Disorder and Psychosis NOS (Holland)	87.9% M 12.1% F	Mean = 32.73 (8.26) Range 19-51
21	Nestor *et al.* (1995)	46	Retrospective Cross Sectional	To investigate the relationship between lethal violence and psychosis	Psychiatric inpatients at high secure hospital in Massachusetts (USA)	100% M	Severely violent mean = 32.5 (9.7) Less violent mean = 28.2 (8.1)
22	Russo, Salamone & Villa (2003)	265	Retrospective Correlational	Identify personal and family characteristics which correlate with criminal behaviour. Compared mentally ill criminals with mentally ill non criminals	Psychiatric inpatients (violent and non violent offenders and non offenders) (Italy)	100% M	Violent Offenders Mean = 36.8 Non violent Offenders Mean = 33.1 Non offenders Mean = 40.6

23	Silva, Leong, Weinstock, & Klein (1995)	50	Prospective Case Control	Comparison of individuals with misidentification delusions (MD) and those with other delusions (NMD)	Recruited 25 MD and 25 NMD (USA)	92% M 8% F	Mean – MD = 36.1, NMD = 37.2
24	Stompe *et al.* (2004)	224	Retrospective Case control	Compared schizophrenic violent and non-violent men for TCO prevalence	High secure schizophrenic inpatients (Austria)	100% M	Mean – Violent = 29.9 (9.2); Non-violent = 29.3 (8.7)
25	Swanson, Borum, Swartz, & Monahan (1996)	10, 066	Retrospective Epidemiological study	Examined the strength of the association between psychotic symptoms and violence	General population from three geographical sites – Epidemiological Catchment Survey (USA)	Not specified	Not reported
26	Taylor *et al*. (1998)	1,740	Retrospective Epidemiological study	Explore the association between mental disorder and violence	Psychiatric patients (Schizophrenia, Personality Disorder and Substance misuse Disorder) in a high security hospital (UK)	83% M 17% F	Males Mean = 39.4 (11.7) Females Mean = 37.2 (11.8)
27	Teasdale, Silver & Monahan (2006) – McArthur Study Data used	902 (From same pot of McArthur study)		Examined whether gender mediated the relationship between threat delusions (TCO) and violence	Post discharge patients from 3 psychiatric facilities (USA)	57% M 43% F	Not recorded
28	Teixeira & Dalgalarrondo (2009)	60	Retrospective case control	Compared psychotic/delusional, violent and non-violent men	High secure vs. general psychiatric patients (Brazil)	100% M	Mean – Violent = 38 (9.5); Non-violent 38.9

							(9.5)
29	van Dongen, Buck, Kool & van Marle (2011)	357	Prospective Correlational	Examine the relationship between persecutory ideation and self-reported aggression	Community based general population and inpatient psychiatric population combined (Holland)		Community Mean = 25.11 (10.08) range 17-73 Psychiatric Mean = 29.01 (9.32) range 18-58
30	van Dongen *et al*. (2012)	77	Mixed methods (Experimental and Correlational)	Examine the role of ideational distress in mediating the relationship between persecutory delusions and reactive aggression	General population (Holland)	31.2% M 68.8% F	Mean – M = 21.6 (3.3), range 18-30; F = 22.4 (6.0), range 18-50.
31	van Dongen, Buck and van Marle (2012) -Same sample as van Dongen 2011	44	Prospective Correlational	To test whether persecutory ideations have an indirect effect on aggression through delusional distress	Psychiatric inpatients from general psychiatric hospital wards (Holland)		Mean = 33.27 (9.92) range 19-58
32	Wessely & Buchanan (1993)	83	Prospective Epidemiological study	Establish the prevalence and associated beliefs of delusional action	Psychiatric inpatients across 3 London Hospitals with psychosis and at least one non-mood congruent delusion (UK)	55% M 45% F	Mean = 33

** p < .05, **p < .01, *** p < .001*

studies were selected. Studies were conducted in at least 12 different countries; USA (*n*=9), UK (*n*=7), Holland (*n*=4), Israel (*n*=2) and one each from Australia, Austria, Brazil, Finland, Italy, Norway, South Africa and Taipei. Two studies involved international collaborations across North America and Europe.

Fifty percent of the studies explored multiple types of delusions, compared to 41% which examined one specific type. A further 9% investigated delusional thinking overall and not by type. Fifteen of the studies included an examination of persecutory delusions (Studies 2, 5, 6, 7, 9, 13, 16, 17, 22, 26, 28, 29, 30, 31, 32); eleven studies used the category of 'threat-control override' (Studies 2, 3, 6, 11, 12, 18, 19, 20, 24, 25, and 27); and fifteen studies considered types of delusion such as: paranoid, grandiose, nihilistic, misidentification and religious (Studies 2, 5, 6, 7, 8, 9, 11, 15, 16, 17, 18, 21, 23, 28, and 32). None of the studies explored the role of delusions of jealousy, or erotomanic beliefs.

Forty four percent of the studies contained an exclusively violent participant sample and tended to categorise violence by severity. The other 56% comprised a violent group and a nonviolent control, more commonly examining violence in a dichotomous way. All of the studies included behaviours which matched the definition of violence provided earlier, however, the terminology that was used varied. Seven studies explored the relationship

between delusions and violence by categorising behaviours by specific violent offences or actions i.e. attempted murder or hit/kicked (Studies 2, 3, 9, 17, 18, 22, and 26). Thirteen studies utilised the term 'aggressive' (Studies 4, 7, 8, 10, 11, 12, 13, 19, 23, 29, 30, 31, and 32) whereas the remaining thirteen used the term 'violence' within their comparisons and analyses (Studies 1, 5, 6, 14, 15, 21, 22, 25, 26, 27, and 28) . The choice between the two terms appeared to reflect the potential resulting harm. For the most part violence was moderate, but there were studies which either focussed on severe, or lower level behaviour.

Most of the studies reported results which were clearly either supportive of an association, or refuting the relationship. However, there were a few studies whose results were convoluted. This was especially the case for studies which looked at multiple types of delusion. There were 27 findings suggestive of a positive association between delusions and violence. Negative associations were found in five studies (Studies 2, 5, 18, 26, and 31); and the absence of an association was established in seven (Studies 1, 3, 4, 15, 16, 17, and 32). Amongst the 27 positive findings; 10 centred on persecutory delusions increasing the risk of violence in an individual (Studies 5, 6, 13, 14, 22, 26, 28, 29, 30, and 31) and nine reported that the specific group of symptoms referred to as 'threat control

override' (TCO) were important indicators of violence risk (Studies 8, 11, 12, 17, 18, 20, 24, 25, and 27). The other eight findings referred to a mixture of less frequently occurring, less researched delusional beliefs (Studies 4, 7, 9, 10, 15, 21, 23, and 32).

1.4.2 Studies which found a positive association between delusions and violence

Persecutory Delusions and Violence

The mean sample size was 418.5 (SD = 543.7). A summary of the results is presented in Table 2. Seven out of the ten studies purely focussed on persecutory delusions and did not measure other types of belief indicating focus and less dilution (Studies 13, 14, 22, 26, 29, 30, and 31). Similarly, seven of the ten studies had a prospective study design (Studies 5, 6, 13, 14, 29, 30, and 31). Half of the studies included a non-violent control group (Studies 5, 6, 22, 28, and 31) and the majority were mixed gender. It would seem that there is a balance amongst the studies with regards to the source of information, measures and type of analysis they used. Only three studies relied solely on self-report information (Studies 6, 14, and 29); and there was consistency across the studies for the range of tools utilised, albeit some relying heavily on only one or two structured

Table 3 Studies which demonstrated a Positive Relationship between Persecutory Delusions and Violence

Study No.	Study	Sources of Information	Measures Utilised	Delusional Type	Categories of Violence	Statistical Analysis	Results	Findings
5	Cheung *et al.* (1997)	Self-report, staff observation	PANSS, MADS, SOAS	Reference, persecutory, grandiose, somatic, passivity, jealousy, bizarre	Violence, non-violence	Logistic regression, student t-test, chi squared test	Violent group sig. more persecutory**. Violent group more anger*** and less elation*** associated with delusions	Association between persecutory delusions and violence. Anger sig. predictor of violence
6	Coid *et al*. (2013)	Interview with patient	MADS, MacArthur Community Violence Interview	32 different delusions defined	No violence, minor violence, serious violence	z scores and odds ratios	Relationship between delusions and minor violence mediated by anger (z=2.10)*. Relationship between persecution (z=3.09)**, and violence mediated by anger.	Persecution, linked to serious violence mediated by anger. Anger the only affect due to delusions which was positively associated with violence.
13	Hwang *et al.* (1999)	Interview with patients, care-giver information	MMSE	Persecutory delusions	Physical aggression	Chi squared test	Patients with persecutory delusions displayed more physical aggression than those without (χ^2 = 7.60)**	Sig. difference in the levels of aggression between those with and those without persecutory delusions.
14	Keers *et al.* (2013)	Semi-structured interview, psychometrics	PCL-R, SCID-II	Persecutory delusions,	Violent re-offending	Logistic regression	Persecutory delusions were associated with violence (OR= 3.68, 95% CI=2.44–5.55). The mediating effects of persecutory delusions were confirmed in mediation analyses (β=0.02, 95% CI=0.01–0.04).	Presence of persecutory delusions increased risk of violence more than 3½ times.

22	Russo, Salamone & Villa (2003)	Patient and family interview, criminal and records,	DSM-III-R	Persecutory, other delusions	Murder, non-violent mentally disordered offenders, non-criminal	Factor analysis and logistic regression	Sig. association between delusions of persecution and murder (χ^2 = 15.8)*. Symptoms of persecutory delusions mediated the relationship between schizophrenia and murder (β = .186)**	Significant association between persecutory delusions and violent offending. Delusions of persecution, combined with a diagnosis of schizophrenia significantly predicted violent homicide.
26	Taylor *et al.* (1998)	Independent court reports, psychiatric assessment	ICD-10	Unclear, mainly persecutory but few further details	Homicide, other violent offending, sexual assault, arson	Logistic Regression	Adjusted odds ratio (controlling for offence type) were very high for delusions (OR = 58.9, 95% CI 38.7-88.6)*.	More than 75% of those with a psychosis were driven to offend by their delusions.
28	Teixeira & Dalgalarrondo (2009)	Patient interview, official conviction data, family history, psychiatric staff	MMADS, PANSS	Persecutory, grandiose, control/influence	Violence, non-violence	Univariate logistic regression	Violent individuals more likely to act on delusional beliefs***, have lower negative affect associated with delusion** and less likely to refrain from acting because of the belief**	Violent group had lower scores on refraining to act because of belief and negative affective scores.
29	van Dongen *et al.* (2011)	Self-report measures, interview	PIQ, CAPE, AQ, PANSS, MCSDS	Persecutory ideation	Physical aggression, verbal aggression, anger, & hostility	Correlational analysis	Positive relationship between scores on PIQ and AQ in community sample (r_s = .45)***. High PIQ group scored sig. more on self-reported aggression than the low PIQ group [t(143,49) = -7.71]***	Persecutory ideation significantly related to self-reported aggression in the community based and clinical samples.
30	van Dongen,	Self-report, PSAP	AQ, RPQ, PSAP	Persecutory ideation was only focus	Reactive & proactive	Regression analysis	Sig correlation between persecutory ideation, reactive	For males persecutory ideation predicted

	Buck, & van Marle (2012)	experimental trial			aggression		aggression* and aggression questionnaire***,	reactive aggression but only in those who experienced ideational distress.
31	van Dongen, Buck & van Marle (2012) -Same sample as van Dongen 2011	Self-report measures, patient interview, staff data	PIQ, MINI, PANSS, SDAS	Persecutory ideation, delusional distress	Observed aggression	Spearman's Rho correlation, Bootstrap method	Moderate correlation between persecutory ideation (r = .47)***, delusional distress (r = .44)** and observed aggression. Higher levels of persecutory ideation (β = 0.50, SE = 0.14, t = 3.71)*** and delusional distress (β = 0.49, SE = 0.20, t = 2.46)* predict higher levels of aggression.	Delusional distress partly explained the association between persecutory delusions and violence. When delusional distress as controlled for, persecutory ideation did not predict aggression.

** p < .05, **p < .01, *** p < .001*

assessments. The majority obtained data adequate for regression analysis.

Despite studies investigating the relationship of persecutory delusions to violence for the last three decades, it is notable that over half of the studies retained in this review, finding a positive association, were published in the last five years. This would suggest an increased likelihood in the conceptualisation and measurement of persecutory delusions being more similar.

Unfortunately, the range and type of violence being explored across this group of studies is quite large. Those exploring forms of 'physical aggression' (n=3) were the studies utilising either a general, or a geriatric population, whereas the studies investigating 'violence' all had psychiatric patients as participants. However, the overwhelming pattern of commonality amongst these studies is the theme of delusional distress, or affect associated with holding the persecutory belief. Half of the studies found that anger, negative affect, or delusional distress played a role in the relationship between persecutory beliefs and acting aggressively or violently (Studies 5, 6, 28, 30, and 31).

Threat Control Override and Violence

The mean sample size was 1,908 (SD = 3,238). A summary of the results found amongst these nine studies is presented in

Table 3. Again, nearly all of the studies were prospective in design and over half had non-violent control groups.

Two thirds of the studies had a narrow, TCO only focus in the aim of their research (Studies 8, 12, 20, 24, 25, and 27). Even the other three studies looked at just one other form of delusion, or delusions overall (Studies 11, 17, and 18) none of the studies supporting the TCO and violence association explored multiple delusional beliefs. However, for the most part, all of these studies measured TCO symptoms using different or wide ranging tools, only one more recent study using a specific TCO symptom tool (Study 20). Whilst the concept of TCO is a narrow set of symptoms, it is possible that these studies are measuring TCO quite differently. That said, the analysis across these studies is consistently similar and advanced with all of them using a form of regression analysis and many being able to demonstrate they were controlling for certain confounding variables.

Whilst all of these studies confirmed an association between TCO as a concept and violence, there remained a difference of opinion regarding which of the TCO components is most important. Eight of the studies presented their findings in relation to whether threat, or control override was the predictor of violent behaviour. Half advocated for threat symptoms providing the unique contribution, or most relevant role to violence, the other half

Table 4 Studies which demonstrated a Positive Relationship between Threat/Control Override Delusion and Violence

Study No.	Study	Sources of Information	Measures Utilised	Delusional Type	Categories of Violence	Statistical Analysis	Results	Findings
8	Fanning *et al*. (2011)	Self-report, observation of aggressive behaviour in laboratory task	Adapted PERI, PAS, MIS, RSAS, TRT, BPAQ, LHA	Thought control, thought insertion, threat	Aggressive, non-aggressive	Structural equation models	Threat correlated with BPAQ (0.35)**, and LHA (0.33)** scores, as did thought control (0.22, 0.20)*. Threat found to mediate the relationship between psychosis proneness (0.54)** and aggression (0.41)** but control override did not (0.48**, -0.04)	Psychosis-proneness is positively related to aggression and the best fit model was obtained when threat and control override were modelled as separate variables. Threat does mediate, control override does not mediate.
11	Hodgins, Hiscoke, & Freese (2003)	Official criminal convictions, participant interview, collateral file information	SCID Interview, MacArthur Community Violence Interview, PANSS	Generic delusions, TCO	Aggressive, non-aggressive	Logistic regression	TCO symptoms sig. associated with aggressive behaviour 12 months after discharge [$t(76) = -2.525$]**. Any TCO symptoms (OR = 5.52, 95% CI 1.26-24.12)* or any increase in TCO symptoms (OR = 10.64, 95% CI (2.36-48.01) were sig predictors of aggressive behaviour when PCL-R score over 25 and substance misuse controlled for.	After controlling for ASPD, PCL-R and substance use, the presence of a TCO symptom, or an increase in TCO symptoms significantly increased the risk of aggressive behaviour.
12	Hodgins & Riaz (2011)	Self-report	PANSS, HRSD,	TCO symptoms only	Aggressive, non-aggressive	Multivariate logistic	TCO symptoms sig. predictor of aggressive behaviour (OR =	Risk of aggressive behaviour was increased

			MacArthur Community Violence Interview			regression	2.77, 95% CI 1.19-6.41)*.	2.8 times by each TCO symptom.
17	Link, Stueve, & Phelan (1998)	Fixed format questions and psychiatrist rating	SADS, PERI	Control, persecutory, mind dominated by external forces, thought insertion, people wishing you harm	Physical fighting, weapon use	Regression model	Control***, people wishing you harm*** both predictors of violence.	TCO associated with both types of violence (physical fighting and weapon use). Delusions of control predicted violence.
18	Link *et al.* (1999)	Self-report, patient interview	SADS-I, PERI	TCO, religious, grandiose, nihilistic	Physical fighting, weapons use	Regression models	TCO symptoms were a sig. predictor of violence even when substance misuse, ASPD, and demographic variables accounted for***	Association between psychiatric diagnosis and violence. TCO symptoms strongly related to violence and explained sig. part of above association.
20	Nederlof (2011)	Interview, self-report index of aggression	BIS, PANSS, STAXI, TCOQ, DSSI	TCO symptoms	Physical, verbal, anger, hostility	Hierarchical regression, correlation	TCOQ scores correlated sig. with AQ scores (r =0.43)**. Threat symptoms made a unique contribution to aggressive behaviour (β = 0.26)* whereas control-override symptoms did not (β = 0.05).	TCO symptoms significantly associated with aggressive behaviour. Threat symptoms in particular which carried this effect.
24	Stompe *et al.* (2004)	Case records, official convictions	SADS-L	TCO symptoms only delusion included	Minimal, moderate, moderately serious, serious	Stepwise forward regression	TCO sig. more prevalent in high violence group***, however threat symptoms most important factor (OR=6.78)**	TCO associated with severe violence. Association dependant on threat rather than control/override.
25	Swanson *et al.* (1996)	Semi structured	DIS	TCO symptoms and other delusional	Violence in last year, violence since	Logistic regression	Delusions had odds ratio of 2.6**, combination of	People with TCO symptoms were twice as

		interview		symptoms	age of 18		delusions and hallucinations increased odds of violence to 4.1**.	likely to be violent than those with other symptoms and five times more likely than those with no symptoms or mental illness.
27	Teasdale, Silver & Monahan (2006) – McArthur Study Data used	Interviews with respondents and informants, official records	DIS, MADS	Threat, control/override, TCO	Violent/not violent in last 10 weeks	Hierarchical linear model	Overall threat delusions associated with lower levels of violence (OR = -1.41)***, however gender qualifies this relationship (OR = 1.55)** such that for males threat results in higher violence but for females lower violence. Control/override not associated with violence (p>.05)	Threat delusions associated with an increase in violence in men and a reduction in violence in women. Control override was not associated with violence.

** p < .05, **p < .01, *** p < .001*

suggesting that control override symptoms were either equally as predictive, or solely the relevant component. There was not a clear pattern of differences in design or methodology between those which advocated for threat, or control override.

Other Delusions and Violence

The mean sample size was 106.1 (SD = 78.5). A range of data sources and assessment tools is unsurprising given that these studies included an even number of psychiatric (studies 4, 15, 21, & 23) and geriatric populations (studies 7, 9, 10, & 32), a wide range of less common delusional beliefs, or did not break down delusional beliefs by type. A summary of the findings from the studies are presented in Table 4. This cluster of studies used a wide range of parametric and nonparametric analysis which also reflects the variety of data and potentially suggests that as a group of studies there is less reliable comparison between them. However, it is notable that all, except one (Study 15), of these studies were from either the UK or the USA, indicating less cultural diversity. This is possibly a direct reflection of the delusions being less common and less well evaluated, but could mean an underestimation or representation of the findings.

Whilst the studies included a wide range of types of delusion, some of them only reported the positive associations found. A commonality between the findings of these studies is that out of

Table 5 Studies which demonstrated a Positive Relationship between other Delusions and Violence

Study No.	Study	Sources of Information	Measures Utilised	Delusional Type	Categories of Violence	Statistical Analysis	Results	Findings
4	Buchanan, *et al*. (1993)	Self-report, informant data	PSE, MADS	Delusions, non-delusional	Aggressive action, non-action	Chi squared test	Sig. associations between feeling frightened as a result of belief (χ^2 = 8.71)**, reaction to hypothetical contradiction (χ^2 = 15.77, df = 3)** and acting aggressively.	Self-report indicated an association between feeling sad, frightened or anxious and 'acting'. Neither elation nor anger contributed to 'acting'.
7	Deutsch *et al.* (1991)	Summary notes during each visit to research centre, care-giver report	PDRS, SPAD	Persecutory, reference, jealousy, grandiose, somatic, thought control, other	Aggressive/Non-aggressive	Stepwise binary multiple regression, chi squared test	Delusions** and misidentifications* sig. predict physical aggression but hallucinations do not.	Presence of delusions was sig. predictor of physical aggression but accounted for just 3.5% of variance. Delusions frequently preceded physical aggressions.
9	Gilley *et al.* (1997)	Informant who lives with patient	MMSE, Semi-structured interview	Persecutory, grandiose	Striking with hand/foot, striking with object, push, squeeze or pinch	Logistic regression , general linear model	Presence of delusions sig. predicts both presence** and frequency*** of physical aggression	Delusional thinking increases risk of physical aggression 2.8 times.
10	Gormley, Rizwan & Lovestone (1997)	Interview with patient and carer, key worker informant	CDR, MMSE, RAGE, BEHAVE-AD, HRSD	Delusional thinking	Aggressive, non-aggressive	Correlations, chi-squared tests, logistic regression	Delusion sig. associated with aggressive participants (χ^2 = 6.10)**. Sig. positive correlation between delusions (BEHAVE-AD) and aggression (RAGE) (Spearman's rank coefficient =0.41)***. Presence of delusions only sig.	Aggressive patients were more likely to have experienced delusions and activity disturbance.

							independent predictor (β = 1.26, df = 1)*	
15	Koen *et al*. (2004)	Self-report, family, clinical staff	DIGS, OAS, CABS	Paranoid, grandiose, delusions of control	Violent, non-violent	Multiple logistic regression	Delusions of control (OR = 3.7, 95% CI = 1.21-11.61)* and combined use of cannabis and alcohol (OR = 6.89, CI 1.28-37.05)* were the two sig. predictors of violence in schizophrenics	Delusions of control were significantly more prevalent in the violent group.
21	Nestor *et al.* (1995)	Hospital Records, clinical notes and police reports	BPRS, WAIS, WMS	Impostor, paranoid, personal target, delusional organisation	Severely violent (lethal), less violent	Univariate t-test	Severely violent group more Impostor delusions *, personal target * and higher overall intelligence*	Severely violent group more likely to have delusional beliefs about specific personal targets and believing individuals have been replaced by impostors.
23	Silva *et al*. (1995)	Review of hospital records	BPRS	Misidentification delusions, Non-misidentification delusions	Serious verbal aggression, physical attack, use of weapons	Pearson's chi square test, t-tests	MD group more likely to experience grandiose ideation**, thought disorder**, hostility**, and general psychopathology**	MD group more hostile than NMD group but NMD more likely to use weapons in physical assaults.
32	Wessely & Buchanan (1993)	Self-report, informant information	PSE, MADS	Catastrophe, delusional memories, religious, jealousy, persecutory, grandiose, guilt, sexual	Three classes of action a) aggressive to self or others b) defensive behaviour c) none	Latent class analysis	Based on both self and informant report, delusions of catastrophe (χ^2 = 12.27)** were sig. associated with aggressive actors.	Found support for three classifications of aggressive action linked to delusions. Delusions of catastrophe positively associated with aggressive action.

** p < .05, **p < .01, *** p < .001*

the wide range included, delusions of misidentification, catastrophe and of imposters, were the types which appeared to have relationships with violent behaviour, regardless of the sample being psychiatric or geriatric with Alzheimer's or dementia (Studies 7, 21, 23, and 32). These types of delusion are some of the most extreme that a person might experience and could be argued to be some of the most emotive, or distress invoking of beliefs.

1.4.3 Studies which did not find an association between delusions and violence

The mean sample size was 449.9 (SD = 982.8); however, five of the seven studies had sample sizes of under 100 participants (Studies 1, 3, 4, 15, and 32). The results from the studies are presented in Table 5. Most of the studies were mixed gender and half were prospective in design. Four of the seven studies had found an association amongst some of the variables they investigated, but not amongst those reported in this section (Studies 1, 15, 17, and 32). For example, Koen *et al*. (2004) found an association between delusions of control and violence, but not between paranoid or grandiose beliefs and violent behaviour. Therefore, only three studies exclusively found an absence of associations between delusional beliefs and violence, regardless of which type they explored (Studies 3, 4, and 16).

Table 6 Studies which did not demonstrate a Positive or Negative Relationship between Delusions and Violence

Study No.	Study	Sources of Information	Measures Utilised	Delusional Type	Categories of Violence	Statistical Analysis	Results	Findings
1	Aarsland, *et al.* (1996)	Clinician led neurological assessment	GDS, BPADRS, HDRS, MMSE	Delusional thinking	Verbal outbursts, physical threats/violence, agitation	Stepwise multiple regression	Non-sig. difference in presence of delusion between aggressive and non-aggressive group (p>.05).	Physical aggression was associated with activity disturbance and hallucinations NOT delusions.
3	Bjorkly & Havik (2003)	Self-report, observer ratings	SCL-90R	TCO only category considered	Homicide, attempted homicide, and physical assault	ANOVA, Mann - Whitney, Paired sample t-test	No sig. diff between three categories of violence and TCO symptoms.	Delusions other than TCO were stronger hallmarks of patient symptomology.
4	Buchanan, *et al*. (1993)	Self-report, informant data	PSE, MADS	Delusions, non-delusional	Aggressive action, non-action	Chi squared test	Non-sig. findings were left unspecified, authors merely commented on these narratively	Informant data indicated no association between phenomenology and 'acting'. No associations with conviction or preoccupation of the beliefs.
15	Koen *et al*. (2004)	Self-report, family, clinical staff	DIGS, OAS, CABS	Paranoid, grandiose, delusions of control	Violent, non-violent	Multiple logistic regression	No sig. difference between the violent and non-violent groups in terms of grandiose (χ^2 = 0.005, p=0.944) ad persecutory (χ^2 = 0.01, p=0.940).	Incidence of paranoid and grandiose delusions did not differ between the groups.
16	Laajasalo & Hakkanen (2006)	Criminal index, file data	DSM-III-R	Persecutory, grandiose, reference, jealousy,	Excessive, non-excessive	Logistic regression, Fisher's	Persecutory p=0.433, grandiose p= 0.076, reference p=0.923,	Positive psychotic symptoms, including delusions, were not

				religious		exact t-test	jealousy p=0.077, religious p=0.736	associated with the use of excessive violence.
17	Link, Stueve, & Phelan (1998)	Fixed format questions and psychiatrist rating	SADS, PERI	Control, persecutory, mind dominated by, external forces, thought insertion, people wishing you harm	Physical fighting, weapon use	Regression model	Persecutory, mind dominated by external forces, and thought insertion not sig. predictors	No sig. relationship found between several types of delusional thinking and violence.
32	Wessely & Buchanan (1993)	Self-report, informant information	PSE, MADS	Catastrophe, delusional memories, religious, jealousy, persecutory, grandiose, guilt, sexual	Three classes of action a) aggressive to self or others b) defensive behaviour c) none	Latent class analysis	There was no relationship, either positive or negative, between religious delusions and delusional action (χ^2 test for trend =1.01, d.f. =1, p> 0.25).	Found support for three classifications of aggressive action linked to delusions. However, delusions of guilt, jealousy, delusional memories, & sexual delusions not associated with violence.

These three studies all looked at violent categories without a nonviolent control, explaining perhaps partially why there may appear to be an absence of an association, or a lack of difference between the groups included.

1.4.4 Studies which found a negative association between delusions and violence

The mean sample size was 467.4 (SD = 512); although three studies were less than 167 (Studies 5, 19, and 32) and the other two studies were based on the same large sample (Studies 2, and 27). The results from the studies are presented in Table. 6. There was a mix of males and females in the studies. Three of the five studies reported as finding a negative association, also found either a positive association or none in their results, which are reported in the previous sections (Studies 5, 27, and 32) . Only two of the studies exclusively found a negative relationship (Studies 2, and 19). These two studies were not the ones from the same sample. One explored a wide range of delusions, the other specifically TCO and they examined violence quite differently. However, neither of them had a control group, both examining variations of severity of violence, rather than the violent/non-violent dichotomy.

One study of the two studies using the same sample has indicated an exceptionally important finding (Study 27). It

Table 7 Studies which demonstrated a Negative relationship between Delusions and Violence

Study No.	Study	Sources of Information	Measures Utilised	Delusional Type	Categories of Violence	Statistical Analysis	Results	Findings
2	Appelbaum Robbins, & Monahan (2000)	Interview with patients, hospital records, criminal records	MADS	Persecutory, mind/body control, grandiose, thought broadcast, religious, guilt, somatic, other	Battery that resulted in physical injury, sexual assault, threats with weapon in hand	One way ANOVA	No sig. diff between delusional and non-delusional group in terms of violence. Presence of mind/body delusion protective factor*	Neither delusions in general nor TCO were associated with higher rates of violence, even when moderating factor of substance misuse accounted for.
5	Cheung *et al.* (1997)	Self-report, staff observation	PANSS, MADS, SOAS	Reference, persecutory, grandiose, somatic, passivity, jealousy, bizarre	Violence, non-violence	Logistic regression, student t-test, chi squared test	Violent group sig. more persecutory** and less grandiose delusions**. Violent group more anger*** and less elation*** associated with delusions	Association between persecutory delusions and violence, grandiose and non-violence. Anger sig. predictor of violence
19	Milton *et al.* (2001)	Patient interview, official conviction data, hospital notes	SCAN, IGC, OPCRIT, SANS	TCO symptoms	Serious aggression, lesser aggression	Multiple regression models	High TCO score showed a reduced risk of any aggression (OR = 2.8, 95% CI 1.3-6.3)*. High TCO scores negatively associated with serious aggression (OR = 4.1, 95% CI 1.2-14.7)*	No specific symptoms or diagnoses associated with nor predicted violent or aggressive behaviour.
27	Teasdale, Silver & Monahan (2006)	Interviews with respondents and informants,	DIS, MADS	Threat, control/override, TCO	Violent/not violent in last 10 weeks	Hierarchical linear model	Overall threat delusions associated with lower levels of violence (OR = -1.41)***, however gender qualifies this relationship (OR = 1.55)**	Threat delusions associated with an increase in violence in men and a reduction in violence in women.

	– McArthur Study Data used	official records					such that for males threat results in higher violence but for females lower violence. Control/override not associated with violence (p>.05)	Control override was not associated with violence.
32	Wessely & Buchanan (1993)	Self-report, informant information	PSE, MADS	Catastrophe, delusional memories, religious, jealousy, persecutory, grandiose, guilt, sexual	Three classes of action a) aggressive to self or others b) defensive behaviour c) none	Latent class analysis	Based on both self and informant report, delusions of catastrophe (χ^2 = 12.27)** were sig. associated with aggressive actors. Negative association between guilt and delusional action (χ^2 = 6.307)*. No other delusions sig. associated with aggression	Found support for three classifications of aggressive action linked to delusions. Delusions of catastrophe positively associated with aggressive action, whilst delusional guilt negatively associated.

** p < .05, **p < .01, *** p < .001*

established that whilst TCO symptoms did not associate with violence, this was negated when gender was controlled for. Then, TCO associated positively with violence in men and negatively associated with violence in women. Given the number of studies with a mixed gender population, this could significantly impact upon their findings.

The studies which suggest negative associations with violence argue this effect is found with guilt delusions, TCO symptoms in females, grandiose beliefs, the presence of elation, and the delusion that one's mind/body is being controlled. With the exception of this last finding, which in hindsight may be affected by gender, there is a loose theme emerging between the other three; one of internalisation, or an internal locus of control.

1.5 Discussion

The strategy enlisted in this systematic review aimed to broadly capture delusions, across diagnoses and in relation to a moderately wide range of violent behaviours or actions, consider the potential associations. The outcome has been that the best quality studies investigating this relationship have sampled, unsurprisingly from psychotic and schizophrenic populations, but also amongst those with Alzheimer's, dementia and the general population.

The high prevalence of research examining the role of persecutory delusions, or 'threat-control override' delusions in violence is reflected in the number of studies of this kind included in the review. Likewise, the rarity of larger studies exploring some of the less frequently occurring delusional beliefs and their relationships to actions is also mirrored in the results.

Overall, the results demonstrate support for a connection between the experience of delusions and the expression of aggressive and violent behaviour. Equally, there appears to be some validity in the view that persecutory beliefs, over and above other kinds of delusion, are relevant to understanding the connection between delusional thinking and violence. The studies investigating persecutory delusions and violence consistently consider how the affective response to experiencing the

delusions (e.g. delusional distress such as anger) potentially mediates this relationship.

The results from the studies examining the TCO concept and violence appeared to have some of the most reliable results, in that they more frequently controlled for other variables known to correlate with violence. However, whilst the association of TCO overall, with violence is seemingly stable, mixed results remain as to whether the threat component, or the control override aspect are responsible for this. If the threat component is solely the contributing factor, the concept of TCO would essentially be redundant; because the 'T' of 'TCO' would be very hard to distinguish from persecutory beliefs. However, if the 'CO' of 'TCO' strengthens the association, or uniquely contributes to the relationship with violence, then a consideration for the affective response to experiencing TCO symptoms would be useful.

Aside from persecutory or TCO delusional thinking, the results indicated, that having delusions per se increased a person's risk for violence. The studies which explored overall delusional thinking, however, did not necessarily indicate whether a particular subtype (e.g. persecutory) was responsible for such results. Delusions of misidentification, of imposters or catastrophe were all highlighted as important. If the hypothesis that delusional distress mediates the relationship between the experience of delusions and violence is to be valued, it could

explain why these types of delusion also relate to aggressive and violent actions. It is logically comprehensible that such delusional thoughts are emotionally loaded and may evoke an emotional response regardless of whether an individual has schizophrenia, dementia, another psychiatric disorder or no clinical diagnosis.

Studies which exclusively found either no relationship or a negative relationship were sparse amongst the included studies. Whether this is representative of the proportion of research overall to have found such results, is unclear.

One study, Teasdale, Silver and Monahan (2006) was the only study to identify that the absence of an association was explained by inspecting the moderating effect of gender. They then established a positive association between delusions and violence for men and a negative relationship between delusional thinking and violence for women. A large proportion of the studies included in the review had a mixed gender population and there was very little evidence that they had accounted for the possible effect of this on the results. Quite simply, this could account for a substantial amount of the variation found more widely in the research and within this review. It would indicate the possibility that the strength of the associations found could be underestimations of the true picture for men.

Some studies (e.g. Link, Stueve, & Phelan, 1998), found that there was an association between certain aspects, but an absence of one between other variables. The common theme between what were isolated results, appeared to point to the importance, not only of delusional distress, or affective responses, but how these emotional reactions are processed and managed. Delusions of guilt, grandiose delusions and some evidence for female gender negatively moderating the relationship between delusional thinking and violence suggest that the distinction between externalisers and internalisers may be important to consider because it could differentiate those who respond to delusions with action and those who do not.

1.6 Conclusions

Despite there being a substantial amount of variation within the methodologies of the included studies, the majority were prospective in design, used a more than adequate range of data sources, and measures appropriate for the aims of the studies respectively. The included studies may not have enabled statistical comparison, but the results provide a useful overview of the network of connections between delusions and violence. The review has begun to make sense of the overwhelming number of studies and the plethora of mixed results currently available in the field.

Delusions represent an extreme bias in the thought process. Cognitive strategies involved in processing thoughts in response to experiences or events are impacted upon by a range of factors. These include gender and whether someone is an internaliser or externaliser amongst many other things and the emotions experienced in response are a direct reflection of this processing.

It is not difficult to accept that an experience which affects someone's thoughts and feelings may impact upon their behavioural response. But understanding the pathways and the mediating factors which strengthen or determine the direction of this relationship are yet to be clarified. Future research should

seek to refute or confirm the moderating impact of gender on this relationship, should explore whether the association between delusions and violence is present in other clinical groups, and should aim to test the outcomes in larger scale studies of delusional types other than persecutory or TCO symptoms. One study in the review examined whether likelihood for violence was affected by not only the holding of delusional beliefs, but the incidence of being presented with confirmatory, or refuting evidence for the beliefs. This as a contributory factor to the experience of emotions in response to delusions warrants further research attention.

Chapter 2

Delusional thinking in Forensic Personality Disordered Patients: A Contribution to Violent Behaviour?

2.1 Abstract

This article reports an empirical study investigating the extent of delusional thinking amongst a group of personality disordered (PD) violent offenders, receiving treatment in a variety of secure and community forensic mental health settings. Using a cross sectional research design, this study investigated the relationships between the existence of lifetime delusional thinking, the severity of PD, and the severity of violence. Delusional thinking was present in PD offenders; and although at first glance it was seemingly no higher than that found, by previous studies, in the general population; the extent was much greater amongst those with the severest presentations of PD. The offenders who had caused the most severe harm to their victims also appeared to have had higher levels of delusional thinking, but a larger number of offences did not indicate greater lifetime delusional thinking. Bivariate correlation analysis identified a variety of positive, weak to moderate, but significant, relationships suggesting that PD severity, delusional thinking and the severity of violence are intercorrelated. Delusional thinking perhaps has some relevance to violent offending in this population, outside of the beliefs core to PD diagnostic criteria but from these preliminary findings, its role and function is still unclear. Future research endeavors could

examine whether delusional thinking partially mediates, or moderates the relationship demonstrated between PD and violence and what role any evoked emotions may have. Such findings would enable the assessment and treatment of PD offender patients to be greatly enhanced.

2.2 Introduction

2.2.1 Delusions and Violence

A variety of types of delusions have been connected to the risk of being violent (Coid *et al.*, 2013; Haddock *et al.,* 2013; Keers *et al.*, 2013; Link *et al*., 1999; Silva, 1995), and the risk of higher frequency violence (Gilley *et al.*, 1997; Hodgins & Riaz, 2011). This has been consistently found in a range of clinical and non-clinical populations (Van Dongen, Buck, & van Marle, 2012). The most frequently occurring and studied type of delusion with regards to violence appears to be persecutory beliefs (Bentall *et al.*, 2001). It has been hypothesised that persecutory beliefs develop from a cognitive model of threat anticipation. An interaction of reasoning biases and emotional processes (Freeman *et al*., 2007) which have come together to search for meaning in internal and external unusual or anomalous experiences (Freeman *et al.*, 2002).

A body of literature, for a period of time, explored whether it was the presence of anticipated threat, alongside a belief that control over their being was overridden by external forces, which predicted whether someone would act violently (Threat Control Override, TCO). This concept was developed by Link & Stueve (1994) and subsequently generated mixed

findings with regards to whether it was the components in combination (Hodgins, Hiscoke & Freese, 2003; Swanson *et al.* 1996), the threat (Nederlof, Muris, & Hovens 2011; Stompe *et al*., 2004; Teasdale, Silver, & Monahan, 2006), or the control override (Koen *et al.*, 2004; Link, Stueve & Phelan, 1998) which was most important.

There are some delusional beliefs which have established links to violence, but because of their rarity, have not been studied in great numbers. For example, delusional jealousy is a known risk factor for intimate partner violence (O'Leary, Smith & O'Leary, 2007) and homicide (Soyka & Schmidt, 2011; Silva *et al.*, 1998). Erotomanic delusions of love have connections to stalking (Brüne, 2003), violence within stalking (Strand & McEwan, 2012) and homicide (Meloy, 1998). Delusions which have not shown a stable connection to violence have been grandiose beliefs (Koen *et al*., 2004), delusions of guilt (Wessely & Buchanan, 1993) and to a certain extent, delusions of reference (Laajasalo & Hakkanen, 2006).

The direction of research now, concurrent in a number of fields, is to shift from examining factors dichotomously (or categorically), instead, considering concepts on a continuum or severity basis. This has meant that research into the association between delusions and violence has begun to

consider beliefs ranging in strength and actions of varying severity. Some studies have advocated that delusions are related to severe violence, but not less severe violence or aggression (Nestor *et al*., 1995; Russo, Salamone & Villa, 2003). Some have claimed that delusions relate to actions such as safety behaviours, with minor to moderate aggression being one form of this (Freeman, 2007).

Others have started examining the type and level of emotional responses to the experience of delusions. One such avenue of research postulates that the scale of the emotion, or distress strength (Coid, 2013; van Dongen, Buck & van Marle, 2012) determines the severity of the aggression or violence. Whilst others have argued that an increase in emotional response to existing beliefs (Meehan *et al.*, 2006) leads to violence. Nordström, Dahlgren & Kullgren (2006) found that amongst a population of homicide offenders, those who killed family members as opposed to strangers, were both suffering from greater levels of delusions and the delusions they experienced had more obvious relationships to the homicide.

This retracts the focus slightly, from what it is the person believes to how it is they manage the emotional distress associated with the belief. Some people may have persecutory beliefs but cope with their existence very well.

Others may find them extremely distressing and have difficulty managing their physiological response and subsequent behaviour; skills of emotion regulation, which are known to be lacking substantially in the offending population (Gardner, Moore & Dettore, 2014; Roberton, Daffern & Bucks, 2015).

What types of belief people find emotionally charging will be individual and personal to them and in the context of delusional thinking, this may instigate various acts of violence, across a variety of populations. It also partially explains why there is a lack of consensus about whether certain delusional beliefs associate to violent actions or not. Ullrich, Keers & Coid (2013) re-examined the MacArthur study data, which had established a negative association between delusions and violence (Appelbaum, Robbins, & Roth, 2000). By focussing on the temporal proximity of the beliefs to the actions, they found a range of associations all mediated by anger.

2.2.2 Personality Disorder and Violence

People with personality disorder (PD) have great difficulty with interpersonal functioning and this frequently results in interpersonal conflict and may result in violence. Despite the well-documented association between PD's and violence (Yu,

Geddes & Fazel, 2012), the exact nature of this association remains unclear (Howard & Duggan, 2009).

Attention in the research literature has focussed mainly on deficits in behavioural, or emotional self-regulation as being responsible for the link between PD and violence (Newhill, Eack & Mulvey, 2012; Scott, Stepp & Pilkonis, 2014). Anger and a range of other emotions can result from the disparity that one might find between their beliefs and their experience of the reality around them. Coupled with the level of impulsivity experienced in this population (Sebastian *et al*., 2013) an understanding of the pathway from distorted perceptions to violent behaviour develops.

Antisocial, borderline, paranoid and narcissistic PD's are highly prevalent in forensic populations where they often co-occur to a high degree (e.g. Blackburn & Coid, 1998, Coid, 2002; Warren *et al.* 2002). Antisocial PD has been found to be particularly prevalent in both prison and forensic psychiatric settings (Fazel & Danesh, 2002; Singleton *et al.*, 1998). This finding does vary study to study; possibly due to the difficulties with accurately identifying those with PD, antisocial type in particular. In prisons where the ratio of psychiatric input to number of prisoners is low in comparison to forensic psychiatric settings, those with antisocial PD would be harder to differentiate from those who were

antisocial purely in lifestyle for example, especially if this was based on self-report. By the very nature of being in a forensic setting, there is some overlap with the criteria for antisocial PD.

Diagnosing PD can be achieved using one of two main psychiatric systems; either the International Statistical Classification of Diseases and Health Related Problems (ICD-10, 1992), or the Diagnostic and Statistical Manual (DSM-V, 2013). Within the DSM-V the types of PD within the classification system are grouped in 'clusters', based on similarities in concept, or the function of the presentation. There are three clusters, A (odd eccentric), B (dramatic, emotional or erratic) and C (anxious or fearful).

Some studies have identified Cluster B PD's more broadly as common to forensic populations (Coid, 1999); and more likely to be violent as compared to those with Cluster A and C PD's (Coid *et al*., 2006; Johnson *et al.,* 2000). However, when sexual offending is examined separately to physical or general violence there appears to be a higher rate of Cluster C diagnoses instead of (Bogaerts *et al.,* 2008; Raymond *et al.,* 1999), or as well as, antisocial and borderline PD's from Cluster B (Leue, Borchard & Hoyer, 2004; McElroy *et al.*, 1999).

The co-occurrence of antisocial and borderline PD's, in particular, has been found to be associated with a broad spectrum of antisocial outcomes, including violence, and with the presence of psychotic experiences, including delusions (Freestone *et al.*, 2012).

2.2.3 Personality Disorder and Delusional Thinking

Deficits in the cognitive domain, in particular, delusional thinking, have been relatively neglected areas of research. This comes despite a large literature attesting to the link between delusions and violence in a variety of other mental disorders (e.g. Keer *et al*., 2013) and the well-documented presence of delusional thinking in a number of PDs, particularly borderline PD (Zanarini, *et al*., 2013) and paranoid PD (Bernstein & Useda, 2007). Patients with paranoid PD may experience transient psychotic-like symptoms under conditions of extreme stress (Miller, Useda, Trull *et al*., 2001) and may hold unwarranted beliefs that are not always easy to distinguish from true delusions (Bernstein & Useda, 2007).

Borderline PD has been a particular focus in the study of delusional thinking. Bender & Skodol (2007) argued that disturbances in mental representations or schemas – "*troubled ways of thinking*" (p. 502) - drive the troubled

interpersonal relations, affective instability, and impulsivity associated with borderline PD. In a prospective study, Zanarini *et al*. (2013) compared a large sample of borderline PD patients with a smaller sample of other Cluster B PDs. Borderline PD patients were reported to show quasi-psychotic thought described as "*relatively fleeting departures from reality*" (Zanarini *et al*., 2013, p. 676). These disturbed cognitions declined substantially over time but remained a residual problem at 16 years follow-up.

Although much research continues to focus on categorical diagnoses of personality disorders, clinicians have reached a general consensus that dimensional representations are perhaps superior, with such a conceptualisation being considered when the DSM-V was established. However, as yet, agreement has not been reached for how to distinguish between severity and style.

"*Data suggest that generalized severity is the most important single predictor of current and prospective dysfunction, but that stylistic elements also indicate specific areas of difficulty*." (Hopwood *et al.,* 2011, p.305).

2.2.4 Study Rationale

There is an established existence of delusional beliefs in other psychiatric diagnoses (Appelbaum, Robbins & Roth,

1999) and more recently, amongst the general population (Krabbendam *et al.*, 2004; van Dongen *et al.,* 2012). To the author's knowledge, there are no other empirical studies that have aimed to primarily explore the existence, of delusional thinking in a wide ranging personality disordered population, particularly a forensic one.

It is widely known that research has begun to acknowledge the potential presence of delusional thinking amongst people experiencing borderline personality disorder (Zanarini *et al*., 2013) and also paranoid personality disorder (Bernstein & Useda, 2007). Yet beyond these 'types' the presence of transient, or pervasive, psychotic symptoms such as delusional thinking, in the personality disordered population, remain relatively unexamined. Semerari *et al*. (2014) have very recently examined the metacognitive deficits of a personality disordered population. Their findings suggested cognitive, or thought based, dysfunction associated with personality disorder severity and specific metacognitive deficits related to certain personality disordered styles.

There remains mixed opinion about the role of delusional thinking in aggressive and violent behaviour. Therefore, it was considered important to investigate whether delusional thoughts were prevalent within the experience of personality disorder and consider the relationship they may have with

the violent behaviour common to this clinical population. Understanding the existence of the delusional thinking amongst this clinical group would strengthen the accuracies of case formulation, have subsequent impacts upon risk assessment and management, and potentially improve the treatment of personality disordered offenders.

2.2.5 Aims, Objectives and Hypotheses

The overarching aim of this study was to examine what level of delusional thinking was present in a population of offenders with PD, and whether any presence of delusional thinking related to PD severity, and/or violence.

To achieve this, the first objective was to measure a broad range of delusional beliefs and examine any potential differences in their overall lifetime presence. In particular, the study focused on exploring any differences between those with varying degrees of PD severity and those with differing extremities and quantities of violence. The second objective of the study was to establish whether delusional thinking, the severity of PD and the severity of violence, were intercorrelated.

It was hypothesised that delusional thinking would be present in the population of offenders with PD and that:

(i) delusional thinking would be greater amongst those with the most severe dysfunction in personality; (ii) delusional thinking would be greater amongst those where violent offending was the most severe in nature, in terms of both severity of harm caused and quantity of violence; and (iii) delusional thinking would positively and significantly correlate with both the severity of PD and the severity of violence (in terms of harm caused and quantity).

The implications of the findings from this study, supporting, or refuting, the hypotheses are varied. Indications that the hypotheses have some validity would potentially add value to the theory that mental disorder should be viewed as a continuum and acknowledge further the complexities of overlap from one set of diagnostic criteria to another. It may encourage future researchers to investigate these further and it may advance our understanding of how aspects of cognition potentially interact, especially where the outcome is violent behaviour. This could provide meaningful considerations to incorporate into the risk assessment, treatment and management of violent offenders with a personality disorder. For example, the assessment of delusional thinking could be explicitly incorporated into the assessment of risk of violence. Additionally existing therapeutic interventions designed to treat offenders with

severe PD may need to be responsive to the needs of individuals who have a history of delusional thinking.

2.3 Method

2.3.1 Sample

Participants (*n* = 96) were male forensic patients either detained under the Mental Health Act (1983, amended 2007), or supervised in the community, for treatment of their personality disorder. All participants were violent offenders recruited from personality disorder services across two English high secure hospitals (*n*=55), a medium secure hospital (*n*=31) and a low secure and community forensic service (*n*=10).

Participants were included so long as they had at least one identifiable personality disorder meeting the DSM-IV (American Psychiatric Association, 1994) criteria and an absence of major mental illness. Axis I psychotic disorders and bipolar disorder were measured, for exclusion, using the computerized version of the National Institute of Mental Health Diagnostic Interview Schedule (C-DIS: Robins, *et al*., 1981). This was to ensure that any identified presence of delusional thinking, or any other finding was not attributable to such confounds. Similarly, to narrow the complexities of this clinical group, participants were excluded if a history of epilepsy or head injury was noted or if their global IQ, as

measured by the Wechsler Adult Intelligence Scale, was less than 70.

2.3.2 Procedure

Administration of assessment tools

The data collection for this multisite study has been undertaken by a team of highly experienced professionals i.e. forensic psychiatrists, psychologists and career-researchers. The author was part of this team but did not collect all of the data directly. Where an assessment was already conducted as part of routine clinical practice by a qualified professional, it was utilised to reduce the duplication of lengthy assessments for the participant.

Responsible clinicians identified potentially eligible participants and case file exploration identified relevant inclusion or exclusion data for participants who had given their consent. For participants recruited into the study, information pertaining to clinical diagnoses (Axis I and Axis II disorders, DSM-IV), pharmacological treatment, previous drug and alcohol use and history of violence were extracted and then investigated further through the self-report assessment process.

Assessment of Personality

The interview version of the International Personality Disorder Examination (IPDE; Loranger *et al.,* 1994; Loranger 1997) was used to assess the number of dysfunctional traits, amongst the participants. The IPDE is a 99-item semi-structured interview designed to assess the ten DSM-IV Axis II personality disorders and personality disorder not otherwise specified. It has demonstrated good inter-rater reliability (dimensional scores -median ICC = .89, Loranger 1994; categorical - kappa of 0.70 and above, Zimmerman, 1994) and temporal stability (median ICC = .79, Loranger *et al.* 1994, 1999), with the dimensional scores appearing more promising than the categorical.

Individual IPDE items are scored on a three point scale (0=absent, 1=partially present, 2=definitely present) allowing dimensional scores to be derived for individual personality disorder categories. For 13 participants in the study kappa statistics were used, following assessments by an independent forensic psychiatrist, to explore the inter rater reliability (kappa 0.72-0.83, p <0.005).

The IPDE dimensional scores were used to create an overall PD severity variable (a sum of all dimensional scores; Hopwood *et al.*, 2011). This variable was then divided into

three groups to allow for a comparison by category. Grouping dimensional data in such a way is generally not advised for sound statistical analysis (MacCallum *et al.*, 2002); as doing so will reduce the power within the analyses. However, it can help to describe the data and provide perspective.

Assessment of Delusional thinking

The presence and severity of a broad range of lifetime delusional beliefs were measured using the 21-item Peters' Delusion Inventory (PDI; Peters *et al.*, 2004; Peters, Joseph, & Garety, 1999). The internal consistency ($\alpha = 0.82$), test-retest reliability ($r = .78 - .81$, $p<.0001$) are adequate, as were the convergent, criterion and discriminant validity (Peters *et al.*, 2004). A copy can be found in Appendix D.

This was designed because of a dearth of measures which captured a wide range of delusions, not so obscure as to render it not widely useable, nor so common that the beliefs could barely be considered delusional. Peters *et al.* (2004) wanted to capture delusional thinking broadly and after a factor analysis. They chose to maintain 11 'hard to interpret' components as opposed to forcing a 3 or 5 component model to avoid producing a tool with a narrow focus open to the same criticisms as some of the tools they were trying to advance upon. Subsequent analyses have produced the

possibility of a 7 factor model (Verdoux *et al.,* 1998; Lopez-Ilundain *et al.*, 2006). All of these studies have shown good internal consistency.

The PDI can provide four scores, an overall 'yes/no' score indicating whether or not a range of beliefs has ever been held, then belief conviction, preoccupation and distress dimensional subscales indicating the severity, respectively, related to holding each belief. Examples of the items are: "*Do you ever feel as if things in magazines or on TV were written especially for you?", "Do you ever feel you are being persecuted in some way?*", "*Do you ever feel that you are a very special or unusual person?*" or "*Do your thoughts ever feel alien to you in some way?*"

The yes/no score (range 0-21) is obtained by summing the '0' and '1' applied to whether or not the participant endorsed ever having held the belief being presented in the item. The belief conviction score constitutes a Likert response of 1-5, resulting in a possible score range of 0-105 when responses on all 21 items are summed.

For the purpose of the analysis and results described below, the individual's conviction score was added to his endorsement score to yield a 'total PDI score' for that individual, representing lifetime presence of delusional

thinking, with a maximum possible score of 126. The internal consistency of this measure (α = 0.82) in the current study, was found to be equivalent to that previously reported for PDI by Peters *et al*. (2004). Additional dimensional scores for distress and preoccupation described by Peters *et al*. (2004) were not measured in the present study for two reasons. Firstly, Peters *et al*. reported that the conviction score by itself was sufficient to differentiate a deluded group from a healthy, non-deluded group. Secondly the hypotheses in this study pertain to the importance of the lifetime presence of delusional cognitions, not the emotional responses to them, or the proximal nature of preoccupation. It would not be feasible in this small study to attempt to explore any direct causal link to incidence of violence.

Assessment of Severity of Violence

The severity of lifetime violence was operationalised in two ways. Firstly, the severity of harm caused across the lifetime was measured (Severity of Violence; SoV). Secondly, the quantity of violence (QoV) provided an additional perspective for considering severity as this was not captured by the severity of harm measure.

Using a rating scale adapted from that originally developed by Gunn & Robertson (1976), validated in hospitalised

forensic patients by Wong *et al*. (1993), SoV was captured. Assessment was based on the participants' lifetime history of violent convictions and indexed by the overall degree of harm (physical and/or psychological) inflicted on the victim/s. Thus was rated on a 5-point scale where 0 = no violence; 1 = minor violence; 2 = moderate violence; 3 = moderately severe violence; and 4 = extremely severe violence, e.g. victim/s died or life and health were seriously endangered.

All convictions, except the index offence, were included and considered as a collective, as per the validated version of the tool. No one type of conviction was prioritised, ranked or weighted. Rather, the level of overall harm inflicted on victims was considered and a subjective judgment made. Given that this rating excluded the index offence for which the participants were currently in contact with services, it is important to note that there were nine participants who scored a '0' (no violence) because their index offence was their only offence. The exclusion of the index offence from the SoV measure could be something which impacted upon the overall results and is therefore discussed within the limitations of the study. A selection of cases (n=10) used to examine the inter rater reliability of the ratings yielded a Kappa value of 0.697 (p), indicating substantial agreement (Landis & Koch 1977).

The QoV measure was also based on prior convictions, but included the index offence. The total number of violent convictions was a count of all convictions deemed violent.

The understanding of violence, underpinning the decisions regarding which convictions counted as violent, was from the World Health Organisation: "*The intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation*." (p. 4, Krug *et al*., 2002).

The definition of a 'violent conviction' therefore closely reflected that used by either the Office of National Statistics, or the Crime Survey for England and Wales. Crimes whereby the objective was violence (e.g. ABH, Wounding with Intent) or those whereby violence was used as a means to an end (e.g. Armed Robbery) were included, as were sexual offences, arson with intent to endanger life, kidnap, murder (including attempted), manslaughter and weapon related convictions. Property damage was only included whereby it was known to have occurred in the context of interpersonal violence.

2.3.3 Analytic Strategy

All data analysis was conducted on SPSS version 21. The strategy for statistical analysis was twofold:

Initially, frequencies and descriptive data were extracted for all variables. After statistical and graphical analysis of normality were conducted using the Shapiro Wilk test, histograms and Q-plots, nonparametric, between-groups comparisons were made based on the mean ranks for delusional thinking amongst PD severity and severity of violence groups.

Subsequently, a sequence of nonparametric correlation analyses using Spearman's rho were used to identify whether PD severity, delusional thinking and the severity of violence were intercorrelated. Examining the relationships between these variables has greater power and reliability than the between group comparisons; especially given that the between-group comparisons were based on either groups that were created using cut offs, or groups based on categories within the measurement tool. The correlations provide an analysis without any loss of data.

A post hoc statistical power analysis was conducted using the software package 'GPower 3.1.9.2' (Faul *et al*., 2007). The sample size of 94 was used for the analysis, along with an

alpha level of $p<.05$. The post hoc analysis revealed that utilising a correlational analysis, the statistical power for detecting a moderate effect size ($p=.30$) was 0.85; and for identifying a large effect size ($p=.50$) it was 0.99. However, with the sample being divided into independent groups, the statistical power within the Mann Whitney U and Kruskal Wallis H comparisons was 0.64, based on the same alpha level and obtaining a large effect size ($p=0.5$).

2.3.4 Ethics and Consent

North and East Nottinghamshire Research Ethics Committee granted approval to conduct the study (Appendix E). Informed, written consent was obtained from all participants. Copies of the information sheet and consent form can be found in Appendix F. As stipulated in the ethics approval, participants were compensated with either a £10 gift voucher or £15 cash for travel and sustenance depending on their location. The project was funded by Nottinghamshire Healthcare NHS Trust (Peaks Academic Research Unit; and The Low Secure and Community Forensic Directorate).

2.4 Results

2.4.1 Missing data and the normality of distribution

Data for delusional thinking, and history of violence was available for all 96 participants. However, IPDE dimensional scores, IQ and age at time of the index offence were missing for two (*n*=94) participants.

The observed distributions of PD severity (IPDE dimensional score; *S-W* = .990, *df* = 94, *p* = .728), delusional thinking (Total PDI score; *S-W* = .931, *df*=96, *p* = .000); lifetime SoV (*S-W* = .962, *df* = 96, *p* = .008) and lifetime QoV (*S-W* = .601, *df* = 96, *p* = .000) were examined to determine the extent to which the assumption of normality was met. The Shapiro-Wilk test suggested that for three of these variables it was not reasonable to assume equal variance. The PDI scores were slightly positively skewed (S = 0.93 *SE* = 0.25, K = 0.80 *SE* 0.49); the QoV data was rather skewed (S = 4.2 *SE* 0.25, K = 25.2 SE 0.49); and the SoV ratings were somewhat negatively affected by kurtosis (S = -0.12 *SE* 0.25; K = -0.67 *SE* 0.49); as such, non-parametric tests were utilised. Distributions of independent groups within variables were also assessed, leading to a comparison of mean ranks as opposed to a comparison of medians because the distributions were not all considered normal, or the same

as one another. Data transformation was considered but deemed not essential, on the basis that the skewness was not substantial (Tabachnick & Fidell, 2007) and the power of the existing non-parametric tests was adequate. Transforming the data may have had some advantages in countering the impact of having '0' values on the PDI scale and the QoV being a 'count'; but the potential impact on meaningful interpretation negated this.

2.4.2 Sample Characteristics

Demographics

Participants' (n=96) mean age at the time of assessment was 34.8 years (SD = 8.9, range 21-64). The sample's mean global IQ was 90.58 (SD = 13.08). The majority of the sample, 90%, were detained in secure settings (64.4% high security: 35.6% medium security) with the other 10% living in step down accommodation in the community. Ninety four percent of the sample was considered to be of White ethnicity. Four percent were married, 18% were separated, divorced or widowed and the remaining 78% had never married.

Alcohol misuse history was prevalent in 89.7% of the sample and 78.4% of the sample had used illicit substances at some point in their lifetime.

Personality disorder

The mean overall PD severity score (*n*=94) was 59.9 (*SD* = 20.9; *Mdn* = 61.0; range 15-110). For further analysis, half a standard deviation from the mean was used as a cut-off to create three distinct categories: 'lower severity PD' (up to and including 49; *n* = 32), 'moderate severity PD' (50 to 70; *n* = 33) and 'higher severity PD' (71 and above; *n* = 29). An indication of the 'types' of PD characteristics within these groups is provided in Table 8 below.

After exploring the data range it was felt that the arbitrary cut off of one standard deviation (coefficient variation of 35%) was too great. This would result in the 'low severity' and 'high severity' groups containing too few participants, exaggerating the effect of the extremes of the data set. Therefore, half a standard deviation was chosen, which fitted more validly with the natural breaks in the normally distributed data.

Table 8. Mean Cluster IPDE dimensional scores within the PD severity categories

DSM-IV PD Cluster	PD Severity		
Mean IPDE dimensional score (SD)	Lower	Moderate	Higher
Cluster A	6.1 (5.3)	11.6 (6.3)	14.8 (6.2)
Cluster B	24.8 (8.6)	39.7 (8.2)	55.3 (12.4)
Cluster C	5.8 (4.7)	10.3 (5.5)	13.6 (7.0)

Delusional thinking in the total sample

Two scores from the 21 item PDI were initially analysed, the yes/no score and the total score (the sum of the yes/no score and the belief conviction score). The mean PDI yes/no score for the overall sample (See Table 9 p.98) was 5.47 (*SD* = 3.98, *Mdn* = 5, range 0-18) and for the total score it was 24.60 (*SD* = 19.26, *Mdn* = 23, range 0-86).

Table 9 Comparison of current study mean PDI scores with previous mean PDI scores from other studies

	Peters Delusion Inventory – 21 Item Mean Scores (SD, Range)	
Study and population	**yes/no score**	**belief conviction score**
Current Study Personality Disorder	**5.47** (SD = 3.98, range = 0-18)	**19.13** (SD = 15.52, range = 0-70).
Peters *et al* 2004 Deluded Inpatients	**11.9** (SD = 6.0, range = 0-21)	**44.5** (SD = 27.4, range = 0-103)
Peters *et al* 2004 General Population (University Students)	**6.7** (SD = 4.4, range = 0-21)	**20.1** (SD = 16.7, range = 0-93)
Fonseca-Pedero *et al* 2012 General Population (University Students)	**4.30** (SD = 2.78)	-
Scott *et al* 2009 General Population (Birth Cohort)	**5.08** (SD=3.65, range= 0–21)	-

Compared to the findings from previous studies (Table 9); these preliminary findings appear most similar to that of the general population and half that of a psychotic inpatient sample (Peters *et al.* 2004).

Offending history

The participants had convictions for a wide variation of types and number of offences (*Mdn* = 23.0, range 1-154); and specifically violent offences (*Mdn* = 8.0, range 1-135). Violent assault was the most frequent conviction found amongst the sample (52%) and 51% of the sample had a conviction of ABH. Threatening behaviour was found amongst

40% and an offence relating to the possession of a weapon or explosives was also common to 40% of the sample. Sexual offenders accounted for 32% of the sample and arson convictions were found in 26%. Twenty nine percent of participants had been convicted of robbery and 8% of armed robbery. Convictions of manslaughter were prevalent in 11% of the sample, attempted murder in 8%, and murder in 10%. The mean age at the time of first offences was 15.62 (*SD* = 5.04), first violent offence was 18.35 (*SD* = 5.42) and at index offence was 26.81 (*SD* = 7.14).

2.4.3 Do people with greater PD severity exhibit higher levels of delusional thinking?

Using the total PDI scores, a comparison between lower severity, moderate severity, and higher severity PD, tested the hypothesis that those with greater personality dysfunction, may exhibit higher levels of delusional thinking.

A significant difference between the various levels of PD severity, in their total PDI scores (X^2 (2) = 17.82, $p < .001$), was confirmed by a Kruskal Wallis H test, supporting the hypothesis that delusional experiences would be more likely to be found in those experiencing the complexities of greater PD dysfunction.

A higher level of belief conviction, combined with wider range of lifetime belief existence was present in those who were considered 'higher severity PD' (*Mean rank* = 63.1; *Mdn* = 35; range = 0-84, IQR = 26). Those who had a 'moderate level of PD severity' (*Mean rank* = 47.3; *Mdn* = 21; range = 0-48, IQR = 20) and those with 'lower severity PD' (*Mean rank* = 33.59; *Mdn* = 11; range = 0-86, IQR = 18) had progressively lower delusional thinking scores. Post hoc analysis indicated that the significant differences were between both lower severity and moderate severity PD (U = 356.0, p = .02); and moderate severity and higher severity PD (U = 299.5, p = .01). Compared to the overall sample (and previous studies; See Table 10 p.98) the 'lower severity PD' group score less on delusional thinking, the 'higher severity PD' score greater for delusional thinking; and the 'moderate severity PD' group score similarly in their delusional thinking

2.4.4 Do people who have displayed more severe violence, have greater levels of delusional thinking?

Two hypotheses were addressed here, firstly, it was anticipated that participants whose history of convictions contained the greatest inflicted harm on others, would have higher levels of delusional thinking indicated. Secondly, it

was hypothesised that a greater quantity of offending may also be indicative of a higher amount of lifetime delusional thinking.

SoV

The Kruskal Wallis H test indicated a significant difference in delusional thinking (X^2 (3) = 13.45, p = .009) between those with varying levels of violence severity, based on the ratings of harm indexed in their history of convictions. The nine participants, who had a violence severity rating of '0' for previous convictions because they were being treated for their first convicted violent offence had a mean rank PDI score of 24.3 (*Mdn* = 5, range = 0-31, IQR = 20). Those whose violence history indicated minor levels of harm (n = 5) had a mean rank of 40.4 (*Mdn* = 21, range = 0-31, IQR = 23). Those with moderate violence resulting in a mean rank of 45.6 (n = 29, *Mdn* = 17, range = 0-86, IQR = 29) and moderately severe harm from violence having a mean rank of 49.1 (n = 38, *Mdn* = 22, range = 0-60, IQR = 22). Participants who were rated as previously exhibiting violence which had caused extremely severe harm (n = 20), had an even higher mean rank PDI score of 63.3 (*Mdn* = 33, range = 0-84, IQR = 24).

Post hoc analysis clarified that this significant difference was between those rated as demonstrating no previous violence

and both 'moderately severe' (U = 70.5; p = .009) and 'extremely severe' violence (U = 25.2; p = .002). As well as between 'moderately severe' violence and 'extremely severe' violence (U = 248.5; p = .032) themselves.

QoV

When variation in delusional thinking between the categories representing QoV was examined, the Kruskal Wallis H test did not indicate a significant difference (X^2 (3) = 1.72, p = .632). This suggests those with a greater amount of violence across the lifetime do not necessarily demonstrate higher levels of delusional thinking.

Participants who had a lifetime history of three or less offences (n=24) had a marginally lower PDI score, mean rank of 43.5 (Mdn = 16, range = 0-86, IQR = 26). Those who had convictions for either 4-10 offences (n=31), 11-20 offences (n=23), or 20+ offences (n=18) had similar mean ranks of 50.9 (Mdn = 24, range = 0-84, IQR = 30); 49.9 (Mdn = 19, range = 3-60, IQR = 29); and 49.2 (Mdn = 23.5, range = 0-48, IQR = 25) respectively.

2.4.5 Are delusional thinking, PD severity and lifetime history of violence intercorrelated?

To test the hypothesis that delusional thinking, severity of PD and history of violence would be positively related,

correlational analysis (bivariate) utilising Spearman's rho was conducted (See Table 10). This examined the relationships between delusional thinking (the PDI total score), PD severity (overall IPDE dimensional score), the SoV (severity of harm rating), and the QoV (number of lifetime offences). It also included age at time of assessment, first violent offence and index offence; to establish whether these contributed to any findings.

This revealed that PD severity held a significantly positive, modest relationship with the SoV (r^2= .35, p = .001); but not with QoV (r^2= .02, p = .82).

Table 10 Correlational analysis demonstrating the relationship of delusional thinking to personality disorder and violence.

	PD Severity	Severity of Harm	Quantity of Violence
PD Severity	-	.35**	.02
Delusional Thinking	.45**	.35**	.06

** significant at the p<.01 level

The lifetime history of delusional thinking correlated moderately, and significantly, with PD severity (r^2= .45, p = .000). Delusional thinking also correlated with the SoV (r^2= .35, p = .001) but lacked a significant relationship with QoV (r^2= .06, p = .57).

Participants' age at the time of assessment did not associate with delusional thinking (r = -.103, p=.340). However, participants' age at time of first violent offence and their age at index offence, both correlated minimally but significantly with delusional thinking (r = .219, p < .05; r = .252, p < .05).

2.5 Discussion

2.5.1 Outcomes

The initial aim of this study was to identify whether or not delusional thinking was present in a forensic personality disordered population. It was hypothesised that it would be and the results support this notion. Likewise, delusional thinking was postulated to be greater amongst those with the most severe dysfunction in personality and this has been supported. Delusional thinking was hypothesised to be greater amongst those where violent offending was the most severe in nature, in terms of both severity of harm caused and quantity of violence. However, this has only been supported when severity of violence was operationalised by harm. Lastly, it was proposed that delusional thinking would positively and significantly correlate with both the severity of PD and the severity of violence (harm caused and quantity) and the results support this, also only when severity of harm is considered.

Simplistically, the overall level of delusional thinking appears to be on par with that of the general population (see Table 10; Fonseca *et al*., 2012; Peters *et al.,* 2004; Scott *et al*. 2009) and half that of a psychotic sample (Peters *et al.,* 2004). Cursorily, what this potentially appears to suggest is

that the PD population experience no greater tendency for delusional thinking than the general population. However, when looking at the severity of dysfunction related to having PD, the results (on p.96) indicating a significant difference in delusional thinking between low, moderate and severe PD groups; supports the hypothesis that delusional thinking may be significantly higher amongst those with the greatest variety and prominence of problematic characteristics.

Whilst this study did not explore the experience of delusions by PD category due to its sample size, there were a dominant amount of Cluster B diagnoses/characteristics in the sample. However, traits from all PD's were present (Table 8, p.94) and represented increasingly with PD severity. Therefore, the findings of this study neither accurately supports nor refutes those of previous studies (Bernstein & Useda, 2007; Freestone *et al*., 2012; Zanarini *et al*., 2013) that examined PD by category and suggested delusional thinking is associated specifically with PPD, BPD, or ASPD/BPD in combination. In contrast, the results from this study are more consistent with the findings from Semerari *et al*. (2014), who used a model of PD severity and identified that an increased amount of cognitive dysfunction is found, the more severe the nature of the PD presentation.

Like the aforementioned former studies such as Coid *et al*. (2013); Haddock *et al.* (2013); Keers *et al.* (2013); Link *et al*. (1999); and Silva *et al*. (1995); the results support an association between delusional thinking and violent behaviour. Some older studies by Nestor *et al*. (1995) and Russo *et al*. (2003) have proposed that, in psychiatric populations, the association between delusions and violence was only of relevance when considering more severe, or extreme violence. The hypothesis that delusional thinking would differ depending on the severity of violence, has been supported in the current study. However, only when the severity of harm caused was considered.

The correlational analysis in this study indicated that whilst delusional thinking was associated with the severity of harm within an offender's lifetime history of violence, it did not associate with the quantity of violent offences. This is in contrast to findings by Hodgins and Riaz (2011) or Gilley *et al.* (1997). This leads us to ponder whether this relates to something conceptual, methodological, or specifically relates to offender cognitions. For example, whether this finding is borne out of a potential distinction in thinking patterns relating to the severity of harm caused by violence as compared to those cognitions involved in the quantity of violent acts.

There is little agreement about how the severity of violence can or should be captured which has resulted in studies measuring this in a variety of ways. It could be that quantity is not a true indicator of the severity of violence and that these are conceptually quite different. This study focussed on convicted incidences of violence which could partially account for the lack of an association between delusional thinking and quantity of violent offending. It could be argued that those participants whose violence had led to detention in hospital or prison have less opportunity to re-offend in a similar manner due to their incarceration and continual monitoring. Furthermore, the likelihood of further violent behaviour leading to a conviction may also be reduced when an individual is detained in prison or hospital. This means that the QoV variable may not have reflected the true number of violent incidents in their lifetime. Likewise, those whose delusional beliefs were identified early may have received treatment and management interventions which impacted upon the prominence of the delusional thinking, altering the course of potential violent actions.

The mere presence of delusional type beliefs is not necessarily, the aspect of the experience relevant to potential for violence. Whether delusional beliefs relate to violent actions is dependent on other factors which may co-occur

and have not been measured within the scope of this study. As Coid *et al*. (2013) and van Dongen *et al*. (2012) postulated it appears that the emotional response to the experience of delusional thinking could be imperative to understanding this association further. Ullrich *et al*. (2013) claim that anger is the emotion of importance, but the exact manifestation of this is yet to be understood. It may be that the emotional experiences preceding anger i.e. fear or jealousy, or the style of anger exhibition clarify this. For example, it may be that there is a difference between those who internalise emotions as compared to those who externalise their experiences.

2.5.2 Implications for future research

The findings of this study need to be replicated in future studies using a larger cohort of patients. Moreover, it would be useful for future research to focus on examining both the level of emotional distress experienced in response to delusional beliefs and the presence or role of, preoccupation with a belief, in relation to the use of violence and the outcome of severity. Ideally, researchers would seek to undertake studies with methodologies more amenable to examining the proximity of the presence of delusional thinking and possible emotional responses to violent actions.

Unfortunately, it was not feasible within the scope of this study to examine the variables using regression analysis to explore whether any stylistic, or severity aspects of PD predicted delusional thinking. Nor was it possible to assess whether delusional thinking predicted the SoV. Both would provide valuable directions for future research along with the longitudinal consideration of whether delusional thinking potentially mediates or moderates the relationship between PD severity and the SoV.

2.5.3 Study limitations and strengths

The retrospective and cross sectional nature of this study has some limitations embedded. Lifetime measures of both delusions and violence severity, however reliable and valid, have prevented the study from examining the sequencing, longevity or proximity of the incidence of these concepts. Therefore, the results should be considered indicative rather than definitive. However, given the small sample size, an examination of causal relationships would not have been feasible had narrower measures been used. The postdictive design means criterion contamination is a possibility, in that violent actions were measured as both part of the concept of PD (ASPD in particular) and also within the SoV variable. The exclusion of the index offence from the SoV measure rendered nine participants as 'not violent' when they were

actually detained for a serious first offence. However, the Gunn and Robertson SoV tool was applied relatively, based on the nature of the entire population being violent, meaning these nine participants would not likely have scored significantly higher had their index offence been included. Potentially, rather than using the five groups categorised within the tool, these could have been restructured for analysis to create 'lower, medium and higher violence severity' groups which may have more accurately represented the forensic nature of the population.

Whilst the aspects of violence captured within the assessment of PD may have some overlap with the QoV; they have differed substantially from the concept of SoV, which was based on harm caused, measured on an individual basis, as opposed to incidence or type of violence. Where possible the assessor of PD differed from the assessor of SoV and second raters for the SoV also helped to counter this procedural bias.

The current study's sample of purely PD patients, lent itself well to the aims and hypotheses of the study although this could have been enhanced with a non-forensic comparison. The dual operationalisation of violence has added value to the study, however, ideally analysis would have also included 'type' of violence, enabling consideration of the potential

association between possible motivation and delusional thinking

2.5.4 Clinical implications

The results serve as a reminder that when working with clients with personality disorder it is important for clinicians to pay attention to the severity of personality pathology. The potential relevance of a catalogue of diagnosed, and/or sub diagnostic, personality traits to someone's dysfunction needs acknowledging within case formulations and risk assessments for violent behaviour. This could ideally include reference to the potential interaction that certain traits may have with one another; and to the potential accompanying delusional beliefs which may be influential in a patients decision making.

Interventions for those with a personality disorder are generally designed to consider both cognitive distortions and emotion regulation, especially interventions for violence e.g. The Violence Reduction Programme (Gordon and Wong, 2000). However, facilitators and therapists may wish to give greater consideration to the possible associations between PD severity and delusional thinking; and delusional thinking and SoV when considering principles of risk-need-responsivity and developing treatment targets (Andrews & Bonta, 2003).

2.6 Conclusions

Delusional beliefs are found in the general population, so it is not surprising that they are present in a clinical group of offenders for whom difficulties in thought processing are rife.

Limitations aside, this study suggests that not only are delusional beliefs present, but that the lifetime existence of them amongst forensic PD patients, is greater the more severe the PD presentation. Whilst PD severity and delusional thinking were correlated, so were delusional thinking and the severity of violence. Therefore, it is possible that delusional thinking mediates the relationship between PD and severe violence.

Further research, prospective and longitudinal, examining stylistic elements of PD severity and the possible connection to violence severity and type, through cognitive pathways, would expand upon these early findings. Focussing on severity over and above categorical measures seems to be an inclusive and useful way to conceptualise both PD and violence and allows a closer examination of the individualisation, supportive of a greater formulatory approach to both assessment and treatment.

Chapter 3

Addressing change in a violent male offender with co-morbid Schizophrenia and Personality Disorder. Delusions, Psychopathy and Kidnapping: A Case Study.

3.1 Relevance of Case Study to Systematic Review and Empirical Study

Chapter one has examined the research evidence over the past two and a half decades, both in support and contradiction of delusional beliefs, across various psychiatric diagnoses being associated with violent actions.

The empirical study detailed in Chapter two of this thesis has considered the potential of the continuum approach to psychopathology and the presence of delusional thinking in a forensic personality disordered population. Further, the research examined the relationship lifetime delusional beliefs had with severe violent behaviour.

Here in chapter three, the case of a man with co-morbid schizophrenia and personality disorder, who had paranoid delusions which intensified with substance abuse and the subsequent relapse of his mental illness, is considered. The exploration of these experiences within an individual, as opposed to a population, will hopefully add detail and meaning to our understanding of the role and function they may carry in the perpetration of violent offending. Moreover, incorporating this understanding into the risk assessment process, treatment planning and intervention, may enhance outcomes for the reduction of risk for future violence.

3.2 Abstract

This case study explores the outcomes of the application of an eclectic combination of psychological theories and models to the assessment, formulation and treatment of violent behaviour in a man with comorbid schizophrenia and personality disorder. The client had committed offences of kidnapping and Section 18 wounding and been transferred to a low security hospital for treatment of his mental disorder.

A multi-disciplinary approach to the client's treatment enabled him to successfully complete 50 sessions of a 1:1 psychological intervention and a group Anger Treatment Programme, showing clinically significant and reliable change in some of areas of risk targeted in treatment. Under the supervision of a community treatment order, the client returned to live a recovery orientated independent life. There, he was able to apply some of his new skills to improve his antisocial lifestyle, enhance his self-regulation and ultimately reduce his risk for violent behaviour. However, this was not without difficulty. His motivation to change fluctuated and true change was fragile and embryonic without support.

3.3 Introduction

3.3.1 Background

Criminologists, psychologists, anthropologists and sociologists, have all attempted to explain violent behaviour in many different ways. Theories of violence range from those of general systems models (Anderson & Bushman, 2002; DeWall & Anderson, 2011), models of inequality (Dobash & Dobash, 1979), through to social conflict (Witt, 1987), or pathological theories (Weiler & Widom, 1996) of violent behaviour.

To begin to comprehend what an individual experienced in the lead up to behaving violently and how this interacted with that person's developmental history, their personality, and neuropsychological functioning, requires the integration of a whole host of these theories. The results would, however, be unlikely to be the same from one individual, or even one event, to the next. Yet, by forming a working hypothesis reflective of a synthesis of the most salient factors relevant to that individual, a formulation of the risks an individual may pose of acting violently again in the future emerges.

Having been violent previously is a significant indicator of future violence (Herrenkohl, Lee, & Hawkins, 2012). As we

have already explored, having either a psychotic disorder, or a personality disorder, significantly increases the likelihood that a person would find themselves in social conflict, or interpersonal difficulty (Belli & Ural, 2012; Glenn, Johnson, & Raine, 2013). Having a psychosis co-morbidly with a personality disorder is evidenced to increase this risk further (Moran *et al.*, 2003). Having an antisocial PD alongside schizophrenia, perhaps unsurprisingly results in higher PCL-R scores, greater levels of comorbid substance abuse, and significantly more violent behaviour (Moran & Hodgins, 2004).

In the UK, kidnapping another individual is a serious common law offence defined as:

> *"an infringement of, the personal liberty of an individual …. by (1) the taking or carrying away of one person by another; (2) by force or fraud; (3) without the consent of the person so taken or carried away; and (4) without lawful excuse" (Lord Brandon).*

As a form of violence, it is perceived to have three potential motives, benefit of ransom or escape, the intent to harm the victim, or with child victims, to keep them (Crew & Lammers, 2001). When convictions for violence accompany that of kidnapping, it is suggestive of a particular typology. Less offenders kidnap for money (32.9%) compared to those who

kidnap to commit further violence (40.7%; Soothill, Francis & Ackerley, 2007). As with many violent offences, significant risk factors for kidnapping are young age at first conviction of kidnap, and number of previous violent offences. Liu, Francis, & Soothill (2008) identified that five out of every 100 kidnappers would be reconvicted of this same offence within twenty years, but also that having a conviction for kidnapping made someone thirty times more likely than a male in the general population to subsequently commit murder.

Research into kidnapping offences are scarce, most likely due to relatively low numbers of offenders making this difficult to undertake. To understand the functions and motives of such offending, exploring a case of kidnap may shed light onto the uniqueness of such behaviour.

3.3.2 Introduction to the Client

Ethical Considerations

> *"Valid consent is required before client material in an identifiable format may be published in case studies, presentations or other research reports" (BPS, 2001, p.9).*

The client in this case study will be referred to throughout, as Mr. Carr, to provide him with anonymity and to adhere to the

BPS and HCPC guidelines on ethical practice. This need for anonymity, along with it not being deemed to be in the best interests of the client, has prevented the provision of written consent within this case study. It is acknowledged that this is not 'best practice' overall; and in the future written consent would be sought, to avoid any moral or professional dilemmas arising.

The assessment and intervention within this case study did not divert from the routine clinical practice within the service under which Mr. Carr was treated and managed. Mr. Carr was deemed to have capacity to consent to treatment and did sign to acknowledge his agreement with his treatment plan. However, Mr. Carr fully understood the dual role of the author and the intended use of resources utilised in the course of treatment and verbally consented to his case being anonymised. This was reviewed at the end of his treatment. Mr. Carr's victim is referred to as 'Mr. Z' and an influential peer of Mr. Carr's as 'Mr. A'.

The author of the case study was a Forensic Psychologist in Training employed by the Healthcare Trust providing Mr. Carr's care, supervised by a Clinical Psychologist experienced in the provision of a wide range of treatment models, including CAT for the treatment of offenders.

Referral

Mr. Carr was transferred from a local prison to a low secure hospital on Section 37/41 of the Mental Health Act 1983 (amended 2007) after a psychiatric assessment during his remand period confirmed the relapse of paranoid schizophrenia. Mr. Carr had been in prison for eight months since being charged with Section 18 wounding and kidnapping a 15 year old male.

On admission to hospital Mr. Carr was referred for a comprehensive assessment and formulation of his psychological difficulties, his index offence and his risk for future offending. Clinical supervision with ward nursing staff identified consistent observations raising concerns about Mr. Carr's interpersonal functioning, his 'presence' on the ward and psychopathic tendencies. Mr. Carr self-reported substantial difficulties with his attention, processing and retention of information, which was also apparent in his presentation on the hospital ward. Therefore, an assessment of his cognitive ability was incorporated into the assessment of his interpersonal functioning and psychological difficulties to clarify his current level of functioning, its impact on his presentation, and his ability to engage in future treatment. Subsequent to feeding back the assessment outcomes Mr. Carr's clinical team referred him for 1:1 psychological

treatment to address factors related to his index offence with a view to reducing his risk of reoffending and enabling a recovery focused life back in the community.

Sources of Information

The initial assessment involved five sessions of clinical interviewing, about eight hours in total. Healthcare records, clinical case discussions with multidisciplinary team (MDT) members and an interview with Mr. Carr's girlfriend/carer also provided valuable information towards a formulation of his difficulties and presenting risks. Further, pre-intervention assessment constituted around three hour-long sessions completing psychometric assessment tools, tailored to enhance Mr. Carr's formulation and measure change throughout the intervention.

The intervention provided 42 sessions of contact whilst Mr. Carr was an inpatient and 8 as he made his transition back to living in the community. Mr. Carr completed a group alongside the 1:1 intervention throughout the first 16 sessions. This provided a variety of clinical staff, ample opportunity to record and communicate observations of his behaviour and changes to his interpersonal functioning, in a range of circumstances. Fortnightly healthcare reviews also acted as a source of information, capturing Mr. Carr's ability

to apply his learning, adding a qualitative perspective on his progress to enhance the interpretation of his mid and post-intervention psychometrics.

3.3.3 Mr. Carr's circumstances upon admission to hospital

Contact with the Criminal Justice System

Mr. Carr was a 25 year old man who had been in prison on remand for eight months for charges of violent offences before his admission to hospital. Mr. Carr had, in the four years previous to these offences, received convictions for three other violent offences (GBH, ABH and Common Assault). In addition he had also been convicted for failing to comply with restrictions, possession of a class A drug and the cultivation of cannabis.

Contact with Psychiatric Services

Mr. Carr first experienced a level of psychotic symptoms severe enough to initiate contact with mental health services, when he was 15 years old. He was cyclically admitted to both adolescent and adult mental health inpatient units between the ages of 16 and 22 years, for short periods of time. Eventually, his diagnosis transformed from one of psychosis, to paranoid schizophrenia and he continued to be treated by a community team in between admissions. Prior to his index

offences, for which he was on remand, Mr. Carr had failed to accept his depot medication for two months, leading to deterioration in his mental state and an increase in his gravitation towards various other criminal activities.

Lifestyle

Prior to being on remand, Mr. Carr had been living with his aunt and uncle since the death of his mother a few years earlier. His grandmother had also passed away prior to this. Mr. Carr was unemployed and his daily routine primarily involved spending time with a group of antisocial peers that he had known since school. With his peers, Mr. Carr reported engaging in, and financing his lifestyle through, a range of criminal activity. This included fraudulently obtaining expensive material goods, aggressively bullying and intimidating other group members and known associates, organising burglaries and illicit substance use and supply.

Mr. Carr did not have a stable intimate relationship, although he was spending significant periods of time sporadically, with a female friend he had known for many years, who later became his girlfriend.

3.4 Assessment, Analysis and Formulation

3.4.1 Initial Assessment

i) Clinical Interview and File Review

The Risk and Protective Factors Interview (Logan, unpublished) was conducted to gather Mr. Carr's view on significant events and key components of his personal history. This interview format was selected due to its inclusion of discussion surrounding more positive aspects of the client's life. This not only adheres to current best practice guidelines (Good Practice Guidelines on the use of psychological formulation, BPS 2011) but is a less abrasive technique apt for maximising early rapport. The structured nature of this interview allows for collaborative working and potentially assists in reducing paranoid thinking around the intentions of the interviewer. This interview was corroborated with a comprehensive review of his healthcare records.

Mr. Carr was documented to have been born in the area local to the hospital. Psychiatric reports indicated that he reached normal developmental milestones and was in good physical health as a child. Mr. Carr's parents separated when he was very young, around aged two years. Since then, Mr. Carr had not had quality contact with his father, who continued to live relatively close by. Mr. Carr's father ceased contact with Mr.

Carr due to having difficulty managing his own independence. His father reinitiated contact when Mr. Carr was in his teenage years, but again it was short lived and very dependent on effort and motivation from Mr. Carr.

As a result of both his mother and father having subsequent relationships, Mr. Carr had four half siblings, two brothers and two sisters. He was raised by his mother, grandmother, aunt and uncle interchangeably. This meant that Mr. Carr's attachment to his caregivers was disrupted and somewhat dysfunctional as Mr. Carr described all four parental figures as providing very different sets of boundaries and styles of discipline. Mr. Carr detailed that he perceived his mother and grandmother as "*soft*" for not having many rules and never carrying out the threats of discipline made. However, he said his uncle and aunt had many restrictions and would shout and "*pull him around by his ear*" to discipline him.

Mr. Carr's aunt and uncle were both periodically involved in cannabis use and cultivation, for which his aunt and uncle served some time in prison, with his cousin then living with him and his mother. Mr. Carr detailed a very close relationship with his mother, saying he had great amounts of respect for how well she had raised him and his siblings in challenging social and financial circumstances. Mr. Carr described his mother as someone who doted on him when

they were together and always met his material needs. Mr. Carr perceived his childhood as happy, non-abusive, full of freedom but generally uneventful. His primary unhappy memory from childhood was his emotional experiences in relation to his father's inconsistent contact.

Mr. Carr was not bullied at school and in fact he reported being a bully. He viewed school as a place to socialise rather than learn, which he found difficult due to his challenges in his ability to read and write. He did not truant, but described his conduct as mischievous. Mr. Carr said that he used to be very cheeky to teachers, but perceived certain teachers as parental figures and described his behaviour towards them as reflective of this. He said he was nearly expelled in secondary school for drug use. Out of school, Mr. Carr behaved in a similar way, but also described some antisocial behaviours i.e. vandalism and also infrequent non-malicious fire setting such as lighting in an outdoor bin the newspapers he was supposed to deliver. Mr. Carr also disclosed having once kicked a dog, attributing this to the first onset of his psychosis where he would continuously hear a dog bark.

Mr. Carr left school without completing his qualifications. He had brief periods in his teenage years where he was motivated to attend informal employment offered to him. His preferred role was in removals, for two reasons, it was what

his father did and because it showed his physical strength. However, he had not been employed for some years. Mr. Carr claimed this was due to a combination of his mental state, lack of qualifications, lack of motivation for work which was "*not ideal*" to him and because he found it more effective to fund his lifestyle through criminal activity and depending on others (family and partners). Mr. Carr described wanting to go to college and work in the music industry in the future.

Mr. Carr reported two adult intimate relationships that were unstable in nature with him ending one relationship and then re-initiating it frequently, and one with a female who moved into the flat that he had in the past. This relationship is reported to have been volatile, with much furniture being destroyed in their verbal disagreements. Mr. Carr stated this relationship ended due to his aggression and infidelity. He stated and that his mental health, particularly his paranoid thinking, had been a primary factor in his inability to maintain a relationship. Mr. Carr described being verbally, and sometimes physically, abusive if his partner did not care for him (cooking and cleaning etc.). He added he would get paranoid about his partner cheating and would either cheat first, or excessively control her whereabouts to cope with the uncertainty. He justified his actions by explaining that she would slap him too.

Mr. Carr also disclosed that he did not worry about being able to obtain a partner because he believed there was always a female wanting to be in a relationship with him. He stated that for the most part he preferred to focus on himself and not the stress he perceived to be associated with keeping a partner happy.

Psychiatric reports and Mr. Carr's self-report corroborate that a number of persecutory and referential delusional beliefs constitute key components of his diagnosis of paranoid schizophrenia. Mr. Carr also experienced and other positive psychotic symptoms, such as disorganised thinking and auditory hallucinations. He described that since around age 15 he has experienced racing paranoid thoughts about things in both his immediate environment and his future. Mr. Carr said that his greatest emotive responses in relation to these symptoms were: 1) when he believed that others could control his thoughts, 2) that the TV was making reference to him, 3) his partner was cheating on him, or 4) when he felt people were saying things with a hidden meaning and he believed they were trying to make a fool out of him in a furtive way.

Mr. Carr had been prescribed medication since the initial onset of his difficulties, but had periodically stopped taking them. During these times he reported becoming extremely

angry, very easily, in response to symptoms or everyday stressful events which he would usually be able to manage. This was intensified further when he used illicit substances, particularly cocaine.

When asked about incidents of self-harm, or suicidal ideation, Mr. Carr denied having experienced any thoughts of this kind. However, Mr. Carr did explain that if he had a bruise, he enjoyed the pain of pressing upon it, similar to if he went to the gym and enjoyed the ache of his muscles subsequent to exercise.

Mr. Carr explained that his trail of thought, when well, or unwell, tends to take an optimistic path and that he perceives his life as easy and himself as being unbeatable and lucky. Mr. Carr appeared to have an external locus of control, with him attributing both positive and negative experiences to people, or forces, external to himself. For example he expressed a strong belief in fate and destiny. This remained when considering his offending, whereby he attributed his behaviour to the actions of others, offering very limited acceptance of responsibility, for both his violent and nonviolent behaviour. When discussing his conviction for ABH Mr. Carr felt his actions were justified in response to the threats the victim made to take stolen property from Mr. Carr's home. He claimed that he responded this way

because he was provoked and believed the victim had a weapon on his person.

Mr. Carr's account of his index offences followed a similar thought process. Mr. Carr believed a young man, a peer from his group of known associates, had stolen his mobile phone. Mr. Carr described becoming extremely angry when this person tried to sell him a phone which he believed to be the one he had previously had stolen. Mr. Carr threatened the young man and forced him into the back of a van. He assaulted him, drove him to the victim's family home, broke in and threatened the victim's father to provide him with the phone he believed was his. When he was unable to obtain the phone he left and drove the van, with the victim in the back for a long duration, making further threats and further assaults until the vehicle ran out of petrol. Mr. Carr then walked the victim back to the original location, a home of their peers. He continued to carry out intermittent assaults over a 12 hour period, whereby for example, Mr. Carr took the victim into the garden and dropped patio slabs on his hands repeatedly. Mr. Carr had been without his prescribed antipsychotic medication for two months and had increasingly used greater quantities of cocaine. At interview, Mr. Carr expressed regret, but not remorse, maintaining his

perception that he was provoked and that the assault was the victims fault for being so disrespectful.

ii) Observations of Interpersonal Dynamics

Clinical supervision sessions with ward nursing staff and ward review documentation indicated that Mr. Carr's behaviour fluctuated from day to day. He seemed very dependent on which staff were on shift and which other patients were on the ward. Mr. Carr was reported to regularly challenge the rules and procedures within the hospital, having on a number of occasions become hostile and aggressive in response to boundaries being reinforced. His hostility was noted to be short lived and relatively well controlled, with Mr. Carr removing himself from the situation.

Nursing staff found Mr. Carr to be particularly manipulative, both with staff and fellow peers. He was frequently challenged in relation to financial transactions made with peers of greater vulnerability and also made attempts to divide staff, making some his favourites and others his targets. Nursing staff observed Mr. Carr vie for position of the most respected and influential peer on the ward, but also noticed his role as submissive, but passive aggressive when someone of greater dominance was residing on the ward. For example, Mr. Carr would at times be found to be running

errands for another patient without question, but he would then tell staff about that patient's subverting of security. He would also become caught up in financial disputes after seemingly 'taking his percentage', without asking, for running the errands. This only occurred when someone of greater dominance was on the ward.

iii) Personality Characteristics and Clinical Symptoms

The Millon Clinical Multiaxial Inventory-III (MCMI-III) test is a multi-dimensional assessment questionnaire derived from an integrated model of psychopathology and personality and is consistent with the model of the DSM-IV. This approach suggests that an individual's difficulties should be seen in terms of the interaction between long-standing (maladaptive) coping styles and psychosocial stressors.

The MCMI-III is composed of 175 items, scored to produce 28 scales which are divided into: Modifying indices, Clinical Personality Patterns, Severe Personality Pathology, Clinical syndromes and Severe Syndromes. The scales, along with the items which comprise the scales, are closely aligned to both Millon's theory of personality and the DSM-IV. Many of the scales have both theoretical and item overlap, whereby corresponding elevations on conceptually related scales allow for a more complete understanding of the client. The MCMI-III measures for disclosure, validity, desirability and

debasement to ensure a valid set of responses for interpretation. The majority of the MCMI-III's scales have demonstrated internal consistency reliabilities of over .80 (Dyer & McCann, 2000); along with demonstrating strong concurrent validity against other self-report measures examining related constructs (Retzlaff, 1996). Davis, Wenger and Guzman (1997) also indicate that the MCMI-III has good criterion validity, better than that of the MCMI-II. Whilst the MCMI-III's qualities; and use in forensic populations has been challenged (Rogers *et al.*, 1999); more recently it has been supported (Dyer & McCann, 2000).

Mr. Carr's responses were considered consistent and valid. He did not appear to either under or overestimate his personality pathology. During the scoring process only small adjustments were required for 'Anxiety and Depression'. The MCMI-III suggested the presence of a number of elevated personality traits (See Table 11), on the Clinical Personality Patterns (CPP); Severe Personality Pathology (SPP) and the Clinical Syndromes (CS) scales; which may stem from core beliefs and suggest that early difficult relationships and roles may be re-enacted in current relationships with others and the self. Millon *et al.* (2009) state that people with personality difficulties demonstrate problems in adapting effectively to their circumstances and tend to utilise only a

narrow range of coping strategies. Their rigidity has limited the opportunity to acquire and test new, more adaptive coping strategies. Personality traits can act as vulnerability factors for interpersonal conflict, substance misuse, psychosis and risk. The clinical descriptions of the personality traits and how they interrelate are drawn from Groth-Marnat (1997).

Table 11 Summary of Mr. Carr's MCMI-III Outcomes

Interpersonal Functioning	**Lower than Average**	**Average**	**Elevated**	**Significant indicator of pervasive pattern**
Borderline, Anxiety				Adjusted Score Above 85
Dependent, Antisocial, Passive-Aggressive, Sadistic, Schizotypal, Dysthymia, Drug & Alcohol Dependence			Adjusted Score of 75-85	
Avoidant, Depressive, Self-Defeating, Paranoid, Schizoid, Bipolar, PTSD,		Adjusted Score of 45-75		
Histrionic, Narcissistic, Compulsive	Adjusted Score Less than 45			

Mr. Carr's profile of responses indicated that 'Borderline' traits are core to his personality pattern (adjusted score above 85) and demonstrate a persistent problem warranting further/formal assessment. These appeared to be contributed to and further complicated by a pattern of 'Dependent', 'Antisocial', 'Passive-Aggressive', 'Sadistic' and 'Schizotypal'

attributes (adjusted scores between 75 and 85). Whilst these latter characteristics were elevated, but not as high as the former, they demonstrate a complex pattern of personality, individualising the type of 'Borderline' presentation Mr. Carr may have difficulty with. Dysthymia, Anxiety and Drug and Alcohol dependence were also elevated (adjusted scores between 75 and 85) on the clinical syndrome scales, suggesting they are associated in some way to formulation of difficulties.

iv) Comprehensive Assessment of Psychopathic Personality (CAPP, Cooke, Hart, Logan, & Michie, 2012)

The CAPP is an expert observers rating scale completed on the basis of a semi-structured clinical interview, file review and staff ratings of symptoms and trait descriptive adjectives designed to measure a comprehensive range of psychopathic traits spanning multiple domains of functioning (attachment, behaviour, cognition, dominance, emotions and self). The CAPP assesses current dynamic features of the individual rather than presentation across the lifetime. The evaluation of psychopathic traits is independent of criminal behaviour making it a much more sensitive measure of personality than existing measures of psychopathy. It is, therefore, suitable for the detailed evaluation of change in clinical presentation over time.

"The CAPP is an instrument developed primarily for research. It is experimental and currently under validation. Research with the CAPP has been completed or is currently ongoing in the UK, Canada, Norway, Sweden, Denmark and Belgium. Projects include content validation of the CAPP across gender and languages, and construct validation and reliability of the CAPP with male and female adult and young offenders and adult forensic psychiatric patients." (Cooke, Hart & Logan, 2015; http://www.gcu.ac.uk/capp2/whatisthecapp/; accessed on: 07.10.2015)

The thirty three CAPP symptoms were assessed by two clinicians of different professional disciplines (the author of this case study and a senior nursing colleague, keyworker to Mr. Carr) using the rating scale based on information derived from interview as well as collateral sources. Each symptom is rated on a scale ranging from 0-6, where 0-1 suggests a low level of symptom strength and functional impairment, 2-4 suggests a moderate level of symptom strength and functional impairment, and ratings of 5-6 suggest that the symptom was of significant strength – or severity – leading to considerable functional impairment. The scores for each symptom within a domain are then considered to judge the domain overall, on the same scale of 0-6. The interrater reliability was found to be 0.67 (Kappa; $p < .0.001$) which

according to the criteria set out by Landis & Koch (1977) is a substantial level of agreement.

The CAPP assessment indicated the presence of a number of outstanding traits that were both severe in terms of symptom strength and functional impairment, and how pervasive they were. For Mr. Carr, symptoms ranged across all six domains of functioning at the time of assessment (See Table 12 and Appendix G). The most severely affected in trait strength and functional impairment appeared to be 'Self', 'Dominance', and 'Emotion', with characteristics from 'Behavioural' and 'Cognitive' being moderately strong and impaired. The 'Attachment' domain, at the time of assessment, seemed relatively less problematic for Mr. Carr.

Table.12 Summary of CAPP outcomes for Mr. Carr

Domain	Traits judged to be: severe or moderate in strength and impairment	
	Severe	Moderate
Attachment	Unempathic	Uncaring, Uncommitted, Detached
Behavioural	Lacks perseverance, Reckless	Disruptive, Aggressive, Unreliable
Cognitive	Suspicious, Inflexible	Lacks concentration, Lacks planfulness
Dominance	Antagonistic, Deceitful, Insincere	Domineering, Manipulative

Emotion	Lacks remorse, Lacks emotional depth, Lacks emotional stability	Lacks anxiety Lacks pleasure
Self	Sense of invulnerability Unstable self-concept Sense of entitlement Self-justifying	Self-centred Sense of uniqueness

v) Violence

Mr. Carr's risk for future violent behaviour was assessed using the HCR-20 version 2. The HCR-20 is a clinical checklist of risk factors for the assessment and management of the risk of violence – the actual, attempted or threatened physical harm to a person or persons. This may include threats of harm where they are clear and unambiguous or behaviours likely to induce fear such as stalking. The risk factors included in the HCR-20 have been determined from an extensive review of the literature on violence. The HCR-20 tool is not intended to predict the likelihood of violence, although studies (Chu, Daffern, & Ogloff, 2013) have repeatedly demonstrated a moderate level of predictive accuracy. Rather, it is a method to structure clinical judgement in helping to identify relevant risk factors, and, by establishing effective risk management plans, balance these risk factors with protective factors. Further details of the

psychometric properties of this tool can be found in Chapter 4.

Mr. Carr was assessed for his risk of future violence, if his circumstances were that he was in the community. The reason for this were a) to allow more comparable measurement of change from pre to post intervention and b) to generate treatment plans which considered Mr. Carr's risk without the constraint of being in hospital. Risk factors regarded as particularly relevant to a formulation of Mr. Carr's potential for violence in the community were: *Item H1 - Previous violence; Item H4 – Employment problems; Item H5 – Substance use problems; Item H6 - Major mental illness; Items H7 & H9 – Psychopathy and Personality disorder; Item H8 – Early maladjustment; Item C2 – Negative attitudes; Item C4 – Impulsivity and Item R2 – Exposure to destabilisers.*

vi) Wechsler Abbreviated Scale of Adult Intelligence – WASI

The WASI is a screening version of a frequently used psychological test (WAIS-III) for assessing intellectual functioning, which measures both verbal and performance IQ, and is often used as an indicator of cognitive functioning. It has received reliability coefficients of .96 and .98 respectively for adults, on the full-2 and full-4 versions of the

tool. It is sensitive to brain damage and a change over time. These have since been superseded by the WASI-II and the WAIS-IV, but this was what was available at the time of testing. The WASI was selected in accordance with the developers recommended uses and applications of the tool; with the intention of the assessment being to substantiate Mr. Carr's self-reported general difficulties and to ensure his treatment was provided in optimised conditions. It was felt that his difficulties were mostly in connection to memory and were most likely in the context of his diagnosis of schizophrenia. There were not any concerns about head injury, possible organic issues, nor developmental difficulties. Therefore, it was felt the WAIS-III would extend his assessment unnecessarily and such effort may be better utilised in a comprehensive memory assessment subsequently.

Summary of Mr. Carr's results:

A summary of the IQ scores, the indices and the description of what they measure are given in the below See Table 13), followed by a narrative explanation of what this means for Mr. Carr.

Table 13 WASI Summary of Scores

IQ / Index	Description	Score range (95% CI)	Qualitative description	Age related Percentile
Full scale IQ	General overview of thinking and reasoning skills	69-78	Borderline	4
Verbal IQ	Ability to understand verbal information, thinking with words and expressing thoughts in words	66-77	Borderline	2
Performance IQ	Ability to solve non-verbal problems and work quickly and efficiently with visual information	77-88	Low Average	12

General Intellectual Ability

Mr. Carr's general cognitive ability was in the *Borderline* range of intellectual functioning. His full scale IQ (his overall thinking and reasoning abilities) exceeded those of approximately 4% of adults his age (95% Confidence Interval = 69-78). This suggested that he may experience great difficulty in keeping up with his peers in a wide variety of situations that require age–appropriate thinking and reasoning abilities.

Intellectual ability considers both verbal skills and performance skills. The verbal score is a measure of acquired

knowledge, verbal reasoning and comprehension of verbal information. Mr. Carr's verbal reasoning abilities (that is his ability to understand and use vocabulary) were also in the *Borderline* range and above those of approximately 2% of his peers (95% Confidence Interval = 66-77). This indicated Mr. Carr's ability to learn new material may be impeded from this relative weakness in comprehending verbal information.

The performance score provides an indication of an individual's non-verbal reasoning, spatial processing skills, attentiveness to detail and visual-motor integration. Mr. Carr's nonverbal reasoning abilities, as measured by the Performance IQ, were in the '*Low Average'* range and better than those of approximately 14% of his peers (95% Confidence Interval = 78-92).

3.4.2 Case Formulation (See Figure 2, p.152)

"*A good quality case formulation is consistent with theory, usually a generally accepted theory. The case formulation draws on this theory to identify relevant facts in the individual case. The formulation is based on good quality information. There should be a sufficient quantity of information to produce a rich and valid formulation*" (p. 158, Hart *et al.,* 2011).

A case formulation is somewhat different to the formulation of a specified problem. It is more holistic and all

encompassing, without being over inclusive. The relationship between someone's problems, their cause and maintenance are explored by seeking the central underlying mechanisms (Persons & Tomkins, 2007). Ward and Siegert (2002) propose that within forensic psychology a successfully applied theory will utilise multiple factors, incorporating cognitive, affective and behavioural components to explain problematic behaviour and will integrate both distal and proximal factors.

An integrative synthesis of Mr. Carr's salient difficulties was conceptualised using a selection of theory driven models. A CBT, longitudinal model (Beck, 2011; Leahy, 2004) is central to Mr. Carr's formulation, with information gathered through an approach drawing upon both attachment and schema theory and the 'Five Areas' model. This allows a range of problems and difficulties to be summarised within a single model (Wright, Williams & Garland, 2002).

Mr. Carr's challenges are complex, his specified problems ranged from substance misuse, symptoms of schizophrenia, and interpersonal difficulties, to various forms of violent behaviour with differing functions. No single theory captured an adequate understanding of each of these, nor the relationships between them. A CBT model in isolation would have gravitated towards his diagnosis. This would not have

been ideal when collaboratively working alongside a client with high levels of comorbidity and ambivalence over his psychiatric history. It would not perhaps have provided the emphasis required on Mr. Carr's early experiences. Inversely, solely using a CAT, schema or psychodynamic approach at this early stage in the therapeutic relationship would have required too great an input from the client, who remained ambivalent about engaging in the assessment, or treatment process.

The diagrammatic representation (Figure 2, p.152) of Mr. Carr's collaborative formulation, undertaken in parallel with that of the clinical MDT (Good Practice Guidelines on the use of Psychological Formulation, BPS, 2011) has been created by the author. The narrative in the diagram is partially written by Mr. Carr himself.

Attachment and Personality

As a result of the interchangeable and inconsistent care giving, rule and boundary provision in his early years, it would appear that Mr. Carr developed an insecure-ambivalent adult attachment style (Ainsworth & Bell, 1970; Ainsworth *et al*., 1978). Schema theorists such as Young (1994) would suggest that early maladaptive experiences result in individuals such as Mr. Carr developing a number of maladaptive schemas (such as entitlement/self-centredness;

insufficient self-control/self-discipline; abuse/mistrust; enmeshment/undeveloped self; abandonment/instability; defectiveness/shame).

Mr. Carr's father leaving when he was very young and then in his adolescence making unreliable superficial contact, making and breaking promises, left Mr. Carr with a belief that people would leave him and not care for him. He felt that this might be because he was not worth staying for and he established that his father, nor other relatives or peers could be relied upon for emotional or physical support or protection (abandonment/instability; defectiveness/shame; mistrust/abuse). This perception has been consistently present in his apprehension at engaging with his care teams and he states was a signature within his intimate relationships.

Coupled with switching between his mother, grandmother and aunt/uncle with differing approaches to discipline and care Mr. Carr was left without a stable anchor to return to and seek comfort from. This instability meant that Mr. Carr did not necessarily have someone to help him learn how to contain, control or regulate his emotions. In contrast, he found himself using varying strategies with different care givers, in response to both a complete lack of discipline and boundaries with his mother and grandmother, and high levels

of criticism and discipline with his aunt and uncle (insufficient self-control/self-discipline). Mr. Carr has historically shown a variety of impulsive behaviours, including but not exclusive to his substance misuse, promiscuity and aggression. Mr. Carr had a history of getting into fights with security staff in nightclubs, whilst under the influence of alcohol. Hostile outbursts were not frequent in hospital, but were nonetheless characteristic of his interactions with some staff and peers, more so, but not only, whilst he was experiencing symptoms of schizophrenia.

When Mr. Carr's mother and grandmother did spend time with him, they appear to have placed a substantial amount of effort into providing him with material goods and bestowed intense praise upon him for short periods of time. Mr. Carr stated in his mother's eyes he could "*do no wrong*". They 'overindulged' him, communicating how brilliant and special he was, but then returned to a position of distance, without setting any limits and permitting him to do as he pleased (enmeshment/undeveloped self; entitlement/self-centredness). Mr. Carr has reported being quick to bond with people, especially those who show interest in him. However, he felt confused as to why he always took on the characteristics and behaviours of others, when really he wanted to be himself. He stated that he just did not know

how "*to be*". Mr. Carr had a much idealised view on the roles of a mother and father, and aspired to be a good father (described as the opposite to his own father) when he found out his girlfriend was pregnant. In hospital Mr. Carr has persistently found it difficult to adhere to the rules and policies of the wards, describing that they should not apply to him.

Such an approach from his mother and grandmother, combined with his father's absence, has possibly contributed to Mr. Carr having an inconsistent view of self, an exaggerated sense of his own rights, an underdeveloped set of morals and lack of empathy. Such development of narcissism serves to counter his low self-worth and often presents as controlling and domineering. This is an example of an over-compensatory schema mode which has been linked with antisocial personality disorder and offending (Lobbestael, Arnst, & Sieswerda, 2005). Likewise, to cope with his fear of rejection and abandonment, developing an external locus of control has attempted to protect Mr. Carr's self-worth. This means he naturally attributes negative events to others, or things outside of his control and takes little responsibility for negative outcomes.

The impact of these experiences on the development of his personality and interpersonal functioning has been

significant. Mr. Carr appears to have developed a personality with substantial borderline and antisocial traits. His sense of self is questionable, and at best underdeveloped. He is ambivalent about his appearance, his weight, his state of dress, his abilities and his goals for the future. He appears to have become enmeshed with his mother, describing their closeness as "*inseparable*", detailing that they could always tell what one another was thinking without speaking. The enmeshment schema as a framework for understanding Mr. Carr's relationship with his mother, partially explains why her death when he was 21 years old had such a profound effect on his lifestyle and relationship choices subsequently. Mr. Carr described feeling indescribably empty after her passing, stating he had no goals and his lack of regard or care for anyone diminished further.

Mr. Carr states he desires intimate relationships but he appears to easily become enmeshed. He fears that he will expose his vulnerable self and a partner will reject and abandon him. He appears to have sabotaged relationships in the past, through infidelity and violence, possibly to avoid, or control the relationship ending. His maladaptive schemas have led Mr. Carr to become jealous, paranoid and angry in relationships, especially when his emotional needs are not being met. Similarly, when his partners have not met his

expectations regarding providing him with physical care the way his mother did or when they challenge him and his sense of self Mr. Carr's paranoid and anger has increased. His lack of a male role model has led him to be uncertain about what the role of a partner or father 'should' be although he can verbalise what he thinks it 'should not' be based on his own adverse experiences.

Peers

Mr. Carr learnt at an early age that material goods equated to the communication of love and praise. To seek the parental and emotional stability he needed, Mr. Carr made attachments to teachers at school and re-enacted sibling type relationships with his peers.

As he moved into his teenage years Mr. Carr increasingly sought respect and validation, to inflate his self-worth, from antisocial peers and would go to great lengths to avoid their rejection. In particular, Mr. Carr developed a tendency to take on the role of 'protector', fighting with and manipulating rivals to take care of his peers. Mr. Carr perceived the group of peers as his family, even more so after his mother and grandmother's deaths. It is likely that he felt they provided him with an important role, identity and status. Mr. Carr was

familiar with an extended family arrangement and was readily able to identify with the leader of the group.

The lead male in his group of peers, Mr. A, would frequently be absent due to going to prison. Mr. Carr at these times would shift into this role within the group and would become resentful when Mr. A returned and he reverted to a different position in the hierarchy. This appears to mirror Mr. Carr's early life experiences where he became the head of the house hold in his father's or uncle's absence, but then had to switch back to being the child in the relationship when they returned. Parallels to this have also been seen in Mr. Carr's behaviour with peers in hospital.

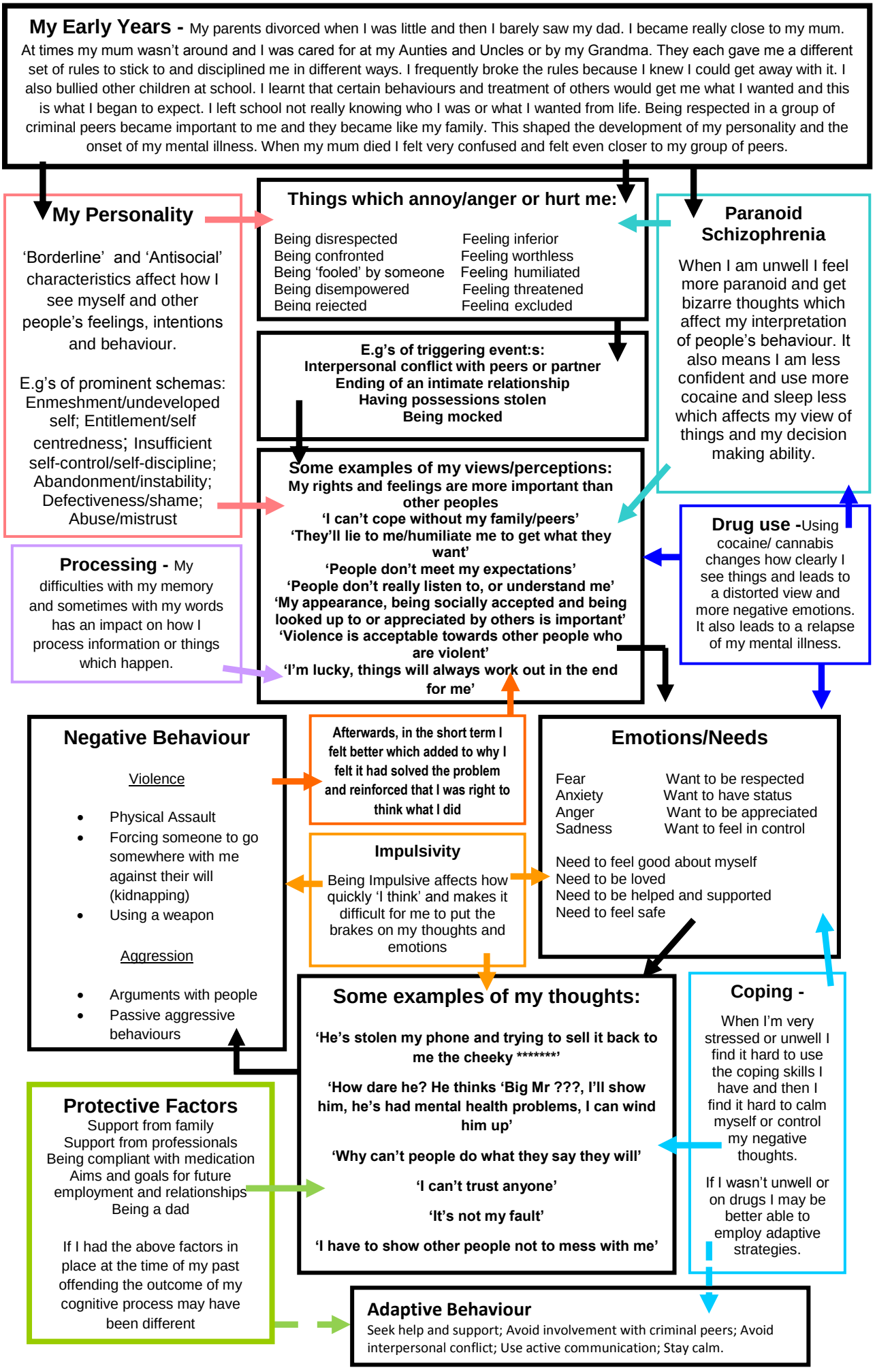
Mr. Carr had invested time and effort into becoming the dominant male on the ward and constructing a hierarchy beneath him. Whilst this is a well-documented phenomenon amongst incarcerated individuals (Liebling & Arnold, 2012), in Mr. Carr's case it is possibly further evidence of his 'over-compensatory' coping style. However, he can quickly change his presentation with the arrival of the dominant Mr. A and this is possibly an indication that his 'vulnerable child' schema mode was being activated.

Violence

There are some striking similarities as well as distinct differences between Mr. Carr's incidences of convicted violence. Mr. Carr's convictions for ABH and then Section 18 wounding and kidnapping have some parallels. Both victims were known associates on the peripheral of his peer group. Both incidents occurred whilst Mr. Carr was supposedly in a lead role within the group. Both situations involved the loss of material goods, and both incidents occurred under the influence of cocaine whilst other peers were present. A distinct difference is that when the ABH occurred, Mr. Carr's schizophrenia was relatively well controlled and there were no known indicators of paranoid thinking or prominent delusional beliefs. During the index offences, however, Mr. Carr's schizophrenia was unmedicated and he was experiencing a wide range of symptoms which had been escalating over a three month period subsequent to the anniversary of his mother's death. This inconsistency indicates that Mr. Carr's violence per se does not only occur in the presence of psychotic symptoms, thus suggesting that the role of his symptoms is one of destabilising or disinhibiting as opposed to the main driver or motivator.

It is believed that the trigger for both of these offences was Mr. Carr's perception of the situation he found himself in. Mr. Carr perceived that both victims were intentionally provoking him. There is a robust empirical research base for the key role that provocation plays in violence (Lawrence, 2006), leading Anderson & Bushman (2002) to describe provocation as "*…the most important factor in aggressive behaviour*" (pp.37). The value of the material goods, that in the first incident were going to be taken from him; and in the index offence, he believed had been taken from him, was greater than the financial cost. Material possessions to Mr. Carr represented either a gift of love and respect to him, or an asset which he could give in order to maintain love and respect from his peers. The threat Mr. Carr came under on both occasions, may have been physical the first time, but both incidents left Mr. Carr perceiving that his position at the

Figure.2 Collaborative Diagrammatic Case Formulation



top of the hierarchy, his identification with a significant other/s was in jeopardy.

Mr. Carr experienced fear that he would lose his status and would either lose his peers respect, or their contact altogether. His perceived consequence to this was that he would lose his family, their validation and his sense of identity. In response to that fear, Mr. Carr overcompensated by becoming violent. Mr. Carr self-reported that he used cocaine to feel more confident and powerful. It is likely that being under the influence during, or shortly before both these offences left Mr. Carr better able to override his inhibitions to act on his emotional responses to the situations.

Prior to the index offence Mr. Carr had experienced a rapid deterioration in his mental state. As the anniversary of Mr. Carr's mothers death passed he experienced a period of depressed mood and refused his depot medication, simultaneously re-initiating cocaine use. He began to experience some delusional beliefs that a taxi driver he met was his mother reincarnated, that known associates of his peer group were out to get him and had infiltrated his group of peers in some way and that the TV was making reference

to him. He reported that he had felt constantly angry and paranoid.

It was hypothesised that these symptoms of schizophrenia lowered Mr. Carr's threshold for being able to cope when his schemas were activated during the interpersonal conflict. Mr. Carr's delusional beliefs, present during the index offences, but not the prior offence, quite possibly exacerbated or even perpetuated his emotional response and distress. They encouraged rumination and thus leaving him even less able to apply any coping strategies to prevent acting on his beliefs. Similarly, being met with disconfirmatory evidence, facts which contradicted his accusations, furthered his anger and sense of humiliation. This meant the conflict came to an impasse and at least partially explains the length of time the assault occurred for and the severity of it. Mr. Carr's antisocial characteristics, including narcissistic and sadistic tendencies also potentially contributed to the severity of the assault.

3.4.3 Initial Conclusions and Recommendations

Mr. Carr was responding well to the initiation of pharmacological treatment since his admission to hospital. However, whilst he had some insight into the impact of his illicit substance use and noncompliance with medication on

his violent behaviour, he had very little insight into his interpersonal style, his difficulties in relationships, or why he so readily experienced angry feelings.

The assessment of his personality indicated a variety of traits which seemed to be functionally impairing him and which, if left untreated/unmanaged, significantly contributed to his risk for future violent behaviour. The HCR-20 identified Mr. Carr as requiring a moderate level of input to prevent the potential for infrequent but very serious, life threatening incidents of violence.

Further Assessment

It was recommended that Mr. Carr be assessed formally/diagnostically for the presence of a potential personality disorder as this may provide further clarity to his formulation and assist him to access the most appropriate services.

Review dates were arranged for Mr. Carr's HCR-20 risk assessment to be updated and for the management plans to be advanced. It was also advised that Mr. Carr be assessed using the Spousal Assault Risk Assessment as Mr. Carr's formulation of attachment and interpersonal difficulties; and his disclosures of violence within a previous relationship identified this as a possible future risk.

Treatment Recommendations

Mr. Carr was referred to the hospital's Anger Treatment Group Programme (Novaco, Ramm, & Black, 2001). It was felt that this could assist Mr. Carr to identify situations whereby he would experience anger, consider what factors would make this potentially unmanageable and to learn strategies for managing this adaptively.

It was recommended that Mr. Carr undertake 1:1 psychological work to begin to address his risk for violent offending, specifically his interpersonal difficulties. It was suggested that as a response to his readiness to engage in treatment, his level of cognitive functioning and his potential to be undertaking a CBT group programme simultaneously, that the model of treatment may most suitably be CBT. This could enhance the effectiveness of the outcomes for both the group and 1:1 treatment.

Nearer to discharge from hospital, it was recommended that Mr. Carr undertake some educational work to enhance his understanding of the conditions and restrictions in place with his section 37/41 of the Mental Health Act 2007.

Post discharge it was highlighted that if Mr. Carr was still engaged in psychological work that a staged transition bring this therapeutic relationship to a close, whilst he built up new

professional relationships with the community team supervising him. This would allow Mr. Carr to apply his learning outside of the hospital environment, with the support of a clinician familiar with his progress through treatment.

3.4.4 Pre Intervention Psychometric Assessment

In response to the recommendations made, Mr. Carr was assessed and accepted for the hospitals Anger Treatment Group Programme (Novaco, Ramm & Black, 2001). This began at the same time as his 1:1 psychological intervention, which also aimed to target Mr. Carr's management of his experiences of anger.

The pre-intervention psychometric assessment incorporated some of the group programme tools and a collaborative formulation of Mr. Carr's difficulties with anger prior to the index offence was generated with the lead programme facilitator. The results of these psychometric assessments are reported along with repeat ones at mid-intervention and post-intervention in the results section (Table 13). Mid intervention psychometric assessments were undertaken to distinguish between change in Mr. Carr occurring whilst he was receiving both group and 1:1 interventions concurrently and when he was subsequently only receiving 1:1

psychological treatment. Some of the psychometric tools were additional to the mandatory group programme ones, but did not have comparable populations against which to measure and assess change. Rather, these served to provide qualitative indicators of change in relation to Mr. Carr's locus of control and interpersonal style. A measure of depression was utilised to assess Mr. Carr's mood state at the time of testing so that this could be taken into account in the interpretation of other findings.

Mood at times of testing

The Beck Depression Inventory (BDI; Beck, Steer & Brown, 1996) is a 21-item self-report questionnaire that assesses someone's current severity of depression. This instrument is one of the most widely-used assessment measures of depression in both research and clinical settings. The internal consistency has been demonstrated to be excellent (.90; Storch, Roberti & Roth, 2004).

Mr. Carr's responses indicated that depressed mood was not something he was having difficulty with at either time of testing. His scores placed him in the 'minimal' range.

Anger

State Trait Anger Expression Inventory–2 (STAXI-2, Spielberger, 1999). The STAXI-2 is a 57 item self-report questionnaire designed to provide concise measures of the experience, expression and control of anger. The experience of anger as measured by the STAXI-2 is conceptualised as having two major components, state and trait anger. State anger refers to the intensity of angry feelings and the desire to express these, at the time of testing. Trait anger evaluates a general predisposition to become angry.

The STAXI-2 consists of 3 scales: 11 subscales and an Anger Expression Index, which provides an overall measure of the expression and control of anger. Norms have been developed by gender for adults in the general population and for psychiatric patients. The internal consistency of the tool has been demonstrated to be robust with Cronbach alphas between .82 and .91 (Culhane & Morera, 2010; Maxwell, Sukhodolsky, & Sit 2009)

Mr. Carr's responses at pre intervention indicated that his state anger, in particular his verbal score, was high and should become a focus of treatment. In combination with other aspects of Mr. Carr's profile (high anger expression out and low anger control in) this is suggestive of a chronic

difficulty with the under control of anger. Mr. Carr's trait anger was moderately high with angry temperament a particular treatment need. This was rated highly and was reflective of Mr. Carr's tendency to readily express his anger with little provocation. However, his angry reaction score was less problematic and below the norm for age related peers, meaning this was not a high priority for treatment. However, this self-report result clashed with his presentation, so it was hoped that some awareness in this area would be gained and it was worked upon in combination with impulsive tendencies more generally. Overall, Mr. Carr's self-reported primary difficulties were with the immediacy of his intense anger experiences and his inability to control outward demonstrations, especially verbally. This was supported by Mr. Carr's expression of anger outwardly score also being problematic and requiring attention. Mr. Carr's anger control scores were similar to the average for similar peers and although they could be improved, they were not a priority treatment target either.

Novaco Anger Scale and Provocation Inventory (NAS-PI, Novaco, 2003). The NAS-PI is a 60 item self-report questionnaire which yields six scores – Cognitive, Arousal, Behaviour, Regulation, a Total score and a Provocation Index. The first five of these are generated from a 3-point

Likert scale, whereas the provocation scale has four options. The tool was developed to be used with both clinical and non-clinical samples and has consistently demonstrated good internal reliability (.76-.89; standardisation sample) and test-retest reliability (.74-.84; clinical sample).

Mr. Carr's profile of responses before treatment demonstrated elevations placing him in the 'high' clinical category for four of the subscales - cognitive, behavioural, provocation and the total score. The concept of provocation seemed to be where Mr. Carr had particular challenges. Arousal and regulation subscales were not reported to be problematic at the time of testing.

These findings were consistent with those from the STAXI-2. Mr. Carr appeared to have a demonstrable difficulty with anger, which seemed to relate to his temperament and cognition, lesser so, his feelings or negative arousal.

Impulsivity

Barratt's Impulsiveness Scale-11 (BIS-11; Patton, Stanford, & Barratt, 1995). This is a 30 item self-report questionnaire designed to measure impulsiveness. All items are measured on a 4-point Likert Scale, with higher scores indicating a higher level of impulsiveness. Overall levels of impulsiveness are defined by three sub scales: 1) Attentional

Impulsiveness, which relates to attention that is required to focus on a task at hand. 2) Motor Impulsiveness, which refers to acting without thinking, or acting on the spur of the moment. 3) Non-planning Impulsiveness, which refers to a lack of forward planning. The scale has been demonstrated to have good internal consistency with a Cronbach alpha of .74 (Carver & White 1994).

Mr. Carr's responses on this assessment tool supported the hypothesis that he experienced difficulties with a range of forms of impulsivity, with elevated scores on all three subscales in comparison to both psychiatric and offender norm groups. Of particular note was Mr. Carr's high motor impulsivity score, which fell just within two SD's above the psychiatric or offender norms.

Interpersonal Reactivity Scale (IRI; Davis, 1980). The IRI is a 28-item self-report measure with a 5-point Likert scale exploring four separate components associated with the concept of empathy - perspective taking, fantasy, empathic concern and personal distress. It has had its internal reliability reported between .65-.76 (Fernandez, Dufey, & Kramp 2011; Siu & Shek, 2005) and its two week test retest reliability demonstrated to be between .68-.83 (Siu & Shek, 2005).

This tool does not have appropriate norms for Mr. Carr. It was used to qualitatively explore his relative strengths and limitations. For three of the scales, higher scores indicate a positive outcome, whereas for the other subscale, personal distress, the objective would be to obtain a lower score. At the beginning of his psychological intervention Mr. Carr's areas of relative limitation were in his ability to perspective take, adopting the viewpoint of others, and the ability to fantasise and transpose himself into the imagined world of a fictitious character. His empathic concern was not as high as ideally it would be, but relatively it was a strength. The items on this subscale pertain to sympathy for unfortunate others. Mr. Carr had clear opinions about who he perceived as unfortunate and those he did not, which may partially explain this score.

Locus of Control

The LOC (Craig, Franklin, & Andrews, 1984) is a 17-item self-report measure exploring the dichotomy of internal vs external locus of control. It has a 6-point Likert scale response where a higher score indicates the acceptance of more responsibility for one's actions, for example offending, or achievements. It has an internal consistency of .83 (Ibid).

This assessment was also utilised qualitatively to explore whether Mr. Carr had a tendency for either internalising, or externalising and to measure whether this shifted with treatment. It does not have a comparable set of scores for either normative or dysfunctional populations. Mr. Carr appeared at pre intervention to have an external locus of control, endorsing items such as 'maintaining control over my problems is mainly due to luck' or 'to continually manage my problems I need professional help' and not endorsing 'my mistakes and problems are my responsibility to deal with'. Accepting responsibility and owning his own behaviour will therefore form a core treatment target.

Self-Esteem

Rosenberg Self-esteem Scale. This is a 10-item self-report questionnaire designed to measure a person's feelings of self-worth over the past month. Mr. Carr demonstrated an average level of self-esteem, strongly agreeing that he was as able as most people and strongly disagreeing with the suggestion that he might feel like a failure.

Conclusions

Mr. Carr had a significant deficit in his ability to manage anger that he experienced and he appeared more likely than most to have angry experiences due to his temperament. His

experience of anger appeared to affect his cognition greater than his arousal. However, Mr. Carr's physiological response was still something he needed to work towards managing better, suggested by his elevated levels of impulsivity. Other treatment targets include increasing Mr. Carr's ability to perspective take and reducing his tendency to default to an external locus of control. A visual representation of where Mr. Carr's difficulty with anger may have originated and its relation to his violent behaviour is presented in Figure 3.

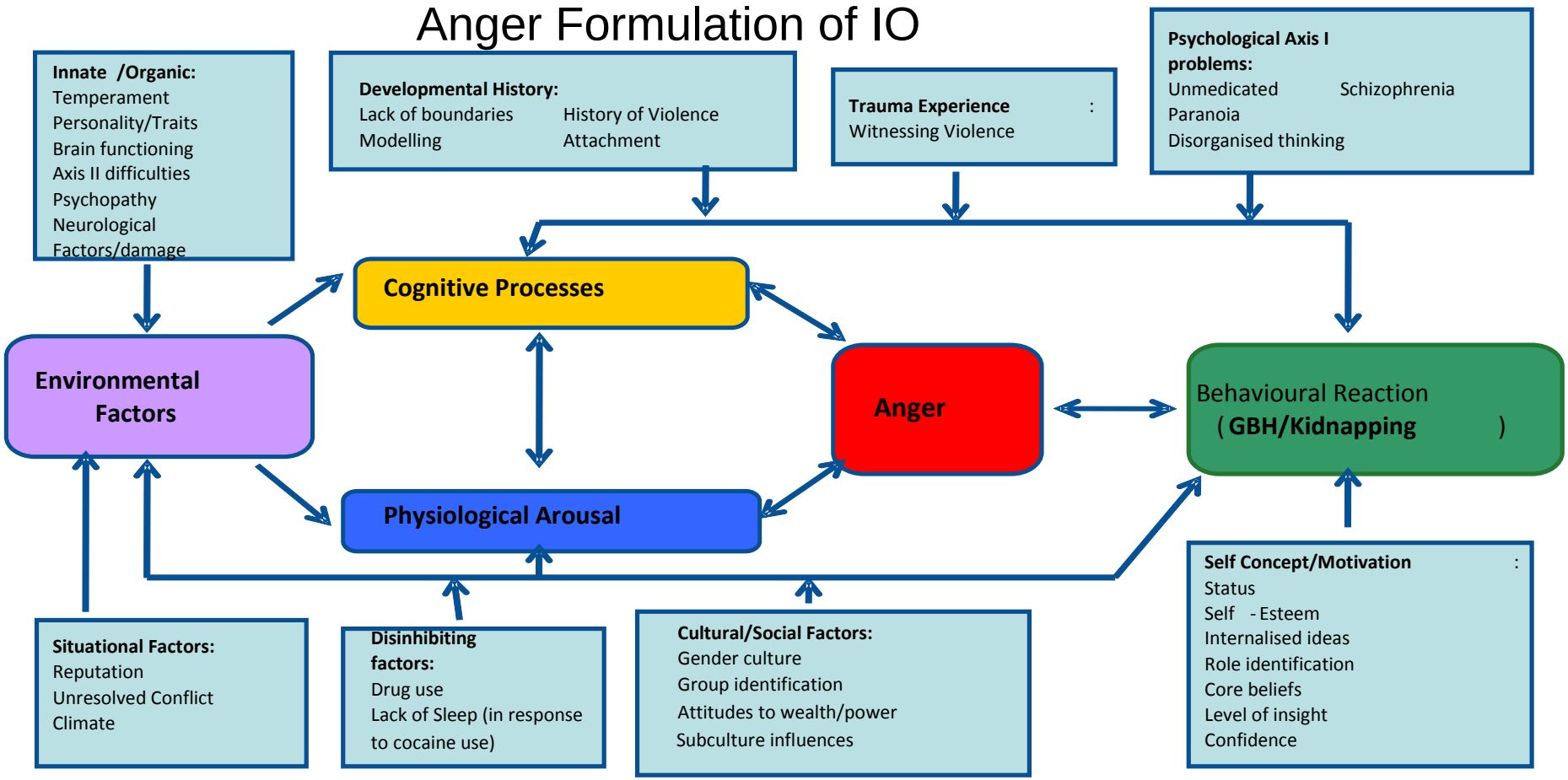


Figure.3 Anger Formulation of Index Offence (Novaco, Ramm & Black, 2001)

3.5 Intervention

The sessions were developed drawing upon a variety of CBT techniques, using an ABC model (Chadwick, Birchwood & Trowers, 1996). Garety *et al.* (2001) advocate that CBT works directly on psychological processes, thus it is one of the most effective interventions for diminishing the effects of positive symptoms.

The first 12 sessions were designed to complement Mr. Carr's engagement in the Anger Treatment Programme and its 1:1 sessions (provided by a group facilitator), reinforcing some of the concepts integrated in Novaco's model. In addition the author aimed to build upon their therapeutic relationship with Mr. Carr to allow a joint formulation of the origins of his offending behaviour.

The next 12 sessions were about Mr. Carr as an individual. They aimed to target the existence and maintenance of delusional beliefs. Research has shown that focussing on positive self-concept, information processing and reasoning biases can reduce the perpetuation of delusional beliefs (Close & Garety, 1998; Garety & Freeman, 1999). The objective was to enable Mr. Carr to develop strategies and a willingness to recognise and challenge his beliefs as inflexibility is associated with poorer

outcomes regardless of the severity of the delusion (Garety *et al.* 1997).

The latter 16 sessions were developed to focus on Mr. Carr in relation to other people. They targeted some of the factors agreed as contributors to, and motivators of, Mr. Carr in the index offence (i.e. negative attitudes, empathy, locus of control, substance use, impulsivity). These sessions utilised perspective taking and empathy building techniques such as those found in Gestalt therapy (Perls, 1951) i.e. the empty chair.

Some sessions had structured activities, but being responsive to Mr. Carr's week by week presentation and arising dilemmas was key and allowed him the space to demonstrate how he was applying the knowledge and skills he was learning. All sessions were tailored to Mr. Carr's borderline level of cognitive functioning, his strengths and limitations, to aid the absorption of the material long term.

3.6 Results

3.6.1 Engagement, Motivation and Readiness to Address Change

In the therapy sessions Mr. Carr engaged at a satisfactory level. It took a while for Mr. Carr to enter into meaningful discussion and to bring quality, honest information about himself and his experiences to the sessions. Whilst always willing to talk and cooperate generally, Mr. Carr would resist discussing negative thoughts, feelings, attitudes, behaviours and experiences, maintaining his presentation in a positive light.

As part of our therapeutic rapport development we discussed issues of trust and transparency. This 'socially desirable mask' was discussed as an observation and it, along with others, was regularly explored via a system of acknowledgement and positive feedback. Once the presence of this mask was minimised, Mr. Carr's quality of engagement was sporadic with him sometimes showing very good insight into his difficulties and other weeks demonstrating very different attitudes and beliefs. This variation was often in respect of levels of victim empathy, antisocial attitudes and attribution of blame which was consistent with his general presentation.

The consensus amongst the MDT at the beginning of treatment was that Mr. Carr's engagement and motivation would likely

fluctuate. Sometimes he portrayed that he had no difficulties to address, other times he insisted he was already beginning to work on the said difficulties, but did not identify difficulties in line with the clinical teams view. This was possibly an indicator of being between the 'precontemplator-contemplator' stages of change (Prochaska & DiClemente, 1983). It was felt that psychometric measurement of his readiness for treatment may not be a very reliable indicator of change on this basis. An aim of treatment was to increase stability and commitment to his overall recovery and reduce the time he would spend in 'precontemplation'.

3.6.2 Progress in Treatment Sessions

It could be suggested that Mr. Carr's continued fluctuations in his ability to empathise with his victim/s reflected 'superficial' improvement i.e. a short term change demonstrated for the benefit of the MDT. However, it was more complex than that. Firstly, his ability to empathise in general was hindered by difficulty experiencing, recognising and expressing emotion in himself and others and secondly, his perception of his 'victim/s' in particular was related to his antisocial attitudes. He did not equate 'known associates' or other 'violent people' who may have put him at threat, or someone who 'had a choice to leave', as 'victims'. These factors meant that change in the area of victim empathy would take some time, but Mr. Carr did make

some improvement and demonstrated a desire to improve this further. For example, he became self-motivated to utilise his key worker sessions, and a diary, to build upon his day to day skill application. He also chose to write, and subsequently rewrite, a letter to his victim (that would not be sent, but used for expression). Pre intervention, Mr. Carr did not identify this as a problem contributing to his risk for violence, so his increase of insight and acknowledgement of these characteristics is improvement in itself. It is possible that what appeared to be a slight shift in increased empathy, was actually a descriptive improvement in perspective taking, because Mr. Carr's expressions of empathy would often be accompanied by minimal emotional congruity.

Mr. Carr continued to vacillate between attributing his behaviour in the index offence to the actions of the victim, saying "*it wouldn't have happened if he hadn't of stolen my phone*", and sometimes describing enthusiastically that he was responsible for the choices he made. At best, Mr. Carr acknowledged that he was "*partly*" responsible for his behaviour, but maintained that the victim's actions and provocation were also to blame. This, in part, may be due to Mr. Carr having poor recall for the events of that day, but is likely to be largely influenced by Mr. Carr's entrenched attitudes towards the normalisation of violent behaviour. Mr. Carr continued to hold residual levels of his

delusional beliefs and these too acted as a barrier to belief, or attitudinal change. Mr. Carr was somewhat inflexible to changing his view of what had actually occurred to him, i.e. was not initially open to the possibility that the phone being sold to him was not the one he had lost. However, he did become willing to entertain the idea that it may not have been.

Whilst Mr. Carr reverted frequently to externalising, progress was shown in the extent to which Mr. Carr could internalise. He demonstrated some progress in how long he could maintain such beliefs for, before challenging them and changing his mind with regards to how much responsibility he was willing to take for his behaviour during the index offence. It should be noted that this vacillation was quite mood dependent and mirrored a 'two steps forward, one back' model where some progress was maintained. For example, Mr. Carr initially, at every ward review, would maintain he was not responsible for his actions and that his actions were not severe. Then over time, his presentation at ward review varied week by week. Eventually, he held the same perspective, that he had made some 'bad' choices and could have done things differently, for a number of weeks before back tracking. Even then he was more readily able to accept challenges to this tendency to revert to his 'old style of thinking'. He also became more consistent in his discussions with different staff members about his role in the index offence. The most

consistent change was with regards to his insight into the severity of the offence as opposed to the incidence per se. He continued to feel justified in acting in response to what he perceived, however, he became regretful for the nature and severity of his actions.

The fluctuation in the views he would share and the lack of accompanying emotion, left staff sceptical about the validity of change. However, despite his 'two step forwards one back' with regards to reflections on the index offence, Mr. Carr was observed to apply some of his new skills during times of conflict on the ward. In particular, staff recorded he could do this when the incident did not directly involve him. He was noted to mediate between peers as opposed to 'take sides' which had been his typical stance. Mr. Carr was known to usually side with the person he perceived to have been the recipient of some wrong doing. He did not apply these skills so readily when he perceived he was being treated unfairly for example.

Mr. Carr acknowledged changeability in the view he had of himself and in how he presented to others depending on who he was with. He detailed how at times he could be kind, thoughtful and generous, especially in relation to his family, yet could be argumentative, impulsive and antisocial when in the presence of certain peers. This level of reflection was novel for Mr. Carr and appeared to be a response to treatment.

Overall, Mr. Carr seemed to become better prepared for further treatment, or more accepting of his ongoing recovery. This shift appeared to reflect a change from being in precontemplation, to contemplation (Prochaska & Diclemente, 1983).

3.6.3 Post Intervention Psychometric Assessment

Reliable and Clinically significant change

Psychometric outcomes for Mr. Carr have been collated into three periods of time. Pre intervention refers to the beginning of both group and 1:1 psychological work being undertaken, subsequent to all of his assessment sessions. Mid intervention refers to the end of Mr. Carr's group intervention, but prior to his 1:1 psychological treatment sessions which continued. End of intervention refers to the ceasing of psychological 1:1 work and the transition to a new clinical team. The period of time from Pre to Mid is four months and from Mid to End is eight months; a year's intervention in total.

Reliable and Clinically Significant Change criterion were calculated (See Table 14) to critically assess the progress Mr. Carr had made throughout his treatment. Thresholds for both reliable and clinical change needed reaching to consider Mr. Carr's change as meaningful. Reliable change figures indicate the amount by which Mr. Carr's scores on each scale needed to reduce/increase by to be considered a significant reliable change.

This was calculated as per Jacobson & Truax (1991) and Evans, Margison & Barkham (1998). This method used the coefficient alpha values for each of the scales within the psychometric assessments, based on the most similar population data. This was clinically and gender specific where possible. The criteria were calculated based on the following formula: 1.96*SD1*sqrt(2)*sqrt(1-rel). The clinical change figures were also calculated using methods originating in Jacobson, Follette and Revenstorf (1984). This method utilised the following formula: crit_c = (stdev(normative data)*mean(patients) + stdev(patients)*mean(normative data))/(stdev(normative data) + stdev(patients)). The resulting figures for each scale demonstrate the cut off past which Mr. Carr's scores must have passed in order to be perceived as having moved from the clinical group to the normative group.

Table.14 Pre, Mid and Post Intervention Psychometric Outcomes

Assessment/Subscale and Direction of Desired Change[6]	Pre Intervention Score	Pre Intervention Score Range[4]	Mid Intervention Score	Mid Intervention Score Range	Post Intervention Score	Post Intervention Score Range	Mean (S.D[1]) of Appropriate Norm[5] Group	Clinically[2] Significant Change	Reliable[3] Change Index Criterion
STAXI-2							Male Psychiatric Patients		
State Anger ↓	24	High	15	Low-Moderate	15	Low-Moderate	22.71 (8.49)	20.80*	5.76*
State Anger Feeling ↓	8	Low-Moderate	5	Low-Moderate	5	Low-Moderate	9.16 (3.97)	7.93*	3.30^
State Anger Verbal ↓	9	High	5	Low-Moderate	5	Low-Moderate	7.73 (3.55)	6.96*	3.11*
State Anger Physical ↓	7	Low-Moderate	5	Low-Moderate	5	Low-Moderate	5.96 (2.09)	5.89*	2.17^
Trait Anger ↓	21	Moderate	17	Moderate	13	Low	20.14 (5.86)	19.24*	5.86*
Trait Anger Temperament ↓	8	High	7	Moderate	4	Low	6.88 (2.92)	6.61*	2.56*
Trait Anger Reaction ↓	8	Moderate	7	Low	6	Low	9.61 (3.17)	9.09^	3.51^
Anger Expression-Out ↓	18	High	12	Low	12	Low	15.68 (4.16)	15.54*	5.16*
Anger Expression-In ↓	15	Moderate	15	Moderate	10	Low	18.26 (4.68)	17.23^	5.80^
Anger Control-Out ↑	19	Low	20	Low	21	Low	21.06 (0.23)	21.17^	0.23*
Anger Control-In ↑	23	Moderate	19	Low	17	Low	21.39 (6.13)	22.01†	5.10†
Anger Expression Index	39	Moderate	36	Moderate	32	Moderate	39.58 (13.96)	-	-
NAS-PI							General Population		
NAS Total ↓	94	High	79	Average	-	-	83.90 (15.60)	-	9.67*
Cognitive ↓	32	High	28	Average	-	-	29.10 (5.00)	-	6.20^
Arousal ↓	30	Average	25	Average	-	-	28.20 (5.50)	-	5.50^
Behaviour ↓	32	High	26	Average	-	-	26.70 (6.60)	-	5.49*
Anger Regulation ↑	24	Low-	27	Average	-	-	25.30 (3.70)	-	-^

		Average							
PI Total ↓	73	High	50	Low-Average	-	-	63.70 (14.80)	-	10.05*
BIS-11							Male Psychiatric Patients		
Motor ↓	30	-	21	-	**16**	-	18.00 (7.00)	16.13*	8.00*
Cognitive ↓	27	-	31	-	18	-	19.00 (7.00)	17.46^	8.00*
Non-Planning ↓	27	-	30	-	25	-	22.00 (9.00)	19.28	10.29
Total ↓	84	-	79	-	**59**	-	69.74 (11.54)	67.19*	12.14*
Rosenberg Self Esteem Inventory ↑	19	Average	20	High-Average	22	High	-	-	-
LOC ↑	35	-	-	-	46	-		-	-
IRI								-	-
Perceptive Taking ↑	14	-	-	-	18	-	-	-	-
Empathic Concern ↑	15	-	-	-	19	-	-	-	-
Fantasy ↑	11	-	-	-	14	-	-	-	-
Personal Distress ↓	17	-	-	-	16	-	-	-	-
BDI	10	Minimal	-	-	6	Minimal	7.65 (5.90)	-	-

[1] SD = Standard Deviation
[2] *Clinically significant change criterion* for each scale calculated according to methods originating in Jacobson, Follette and Revenstorf (1984).
[3] *Reliable change criterion* for each scale calculated according to methods originating in Jacobson, Follette and Revenstorf (1984), amended by Christensen and Mendoza (1986) and later described in Jacobson and Truax (1991) and Evans, Margison and Barkham (1998).
[4] Range as specified in psychometric manual
[5] Appropriate refers to the most relevant norm group for the manual ie Psychiatric, Dysfunctional.
[6] Arrows indicate the desired direction of change, however for some scales/subscales, totals in the high *or* low extreme can be indicative of problems in that area.

^ indicates non-significant non reliable change in the desired direction
* indicates significant change in the desired direction
† indicates significant change in an undesired direction

BOLD numbers in green indicate the point at which the Clinically Significant Change threshold was met.

Underlined numbers in green indicate the point at which the Reliable Change Criterion had been met.

Anger

STAXI-2

Mr. Carr's response profile in the post intervention assessment demonstrated change in the desired direction for all the state anger subscales. These all represented *clinically significant* change, but only half were *reliable*. It is important to note that this level of change was acquired at mid intervention, which was after about 4 months, at the end of the group intervention. This improvement in Mr. Carr's tendency to feel intensely angry, was maintained throughout the duration of solely the 1:1 work. The greatest state anger change was in the context of verbal expression, an area identified as a priority need based on pre intervention scores. Such prominent changes in overall state anger at the end of the group may be testament to the emphasis on the normalisation of anger in the programme. Alternatively, his high pre intervention scores could have pertained to his circumstances and view of treatment at the time.

Mr. Carr's responses in relation to trait anger demonstrated a slower trajectory of progress. Mr. Carr's overall trait anger scores demonstrated *clinically significant* change at the end of the group intervention. This became *reliable* change by the end of the 1:1 psychological intervention. This constituted change in the desired direction on both temperament and reaction subscales by the end of the group, but at that point, not to a

clinically significant or reliable level. After a further 8 months of 1:1 treatment Mr. Carr's temperament change gradually became *clinically significant* and *reliable.* This change represented Mr. Carr becoming more resilient to provocation and more able to avoid using his anger instrumentally. Such changes are not solely dependent on skill acquisition, hence perhaps why this change was more gradual. During the group programme there is an emphasis on skills for arousal reduction and fairly generic problem solving strategies. However our subsequent 1:1 work focussed on reflection and making changes to Mr. Carr's automatic thinking style. The combination of these approaches to treatment may account for this longer term change. Trait anger reaction was not identified as a high priority treatment target for Mr. Carr which could explain why there was less change in this area. Even by the end of 1:1 treatment, it did not become clinically significant nor reliable, although it did continue to shift in the desired direction. His reporting in relation to this was consistent, however at pre intervention it was perhaps an underestimation of his difficulties because staff observations differed from self-report. The post intervention score is perhaps more indicative of the improvements Mr. Carr made with regards to his impulsivity. There is overlap between the two scales.

Mr. Carr's pre intervention assessment had identified anger expression outwardly as a particularly problematic tendency

requiring prioritisation. This was targeted in group and 1:1 treatment and his mid intervention assessment indicated that this had both *clinically significantly* and *reliably* changed. This improvement was built upon further by the end of the continued 1:1 intervention. His inward anger expression was considered to be less than average at pre intervention, indicating that suppression of anger was not a considerable concern. At the end of the group there was no change in this area, however, this did marginally lower further by the end of 1:1 treatment, almost reaching the criterion for reliable change.

Mr. Carr's responses on the anger control inwards subscale demonstrated *clinically significant* and *reliable* change in the undesired direction. By the end of the group Mr. Carr was indicating that he was spending less time and effort trying to calm himself when experiencing anger. This change was *clinically significant* and became *reliable* change at the end of the 1:1 intervention. It is possible that rather than being a negative shift, that this reflects his lessened experience of intense anger, thus less need to put effort in calming himself. Mr. Carr's low anger control out score pre intervention indicated that, in line with not being an anger suppressor, he did not tend to overcontrol either. However, in combination with high outward expression of anger, this represented a less healthy end of the spectrum and it was desirable to increase this score. Mr. Carr's

score did increase slightly, with the *reliable change* criterion being met at the end of the group programme and *clinically significant* change almost being addressed at the end of the 1:1 work.

Overall, Mr. Carr's self-reported STAXI scores indicate that he reduced his frequent intense experience of anger and, thus, his need to expend effort internally calming himself. They also suggest that his tendency towards outward expression of anger reduced, especially in relation to him improving his general temperament and likelihood to use anger instrumentally. The majority of this emotion regulation change occurred throughout the combination of group programme and 1:1 support. However it is important to note that this change continued, was maintained, or only became reliable after continued 1:1 treatment.

NAS-PI

Mr. Carr refused to complete this psychometric at the end of the intervention, because of time pressures he was under. However, it is clear to see that by mid intervention, the group treatment programme combined with 1:1 sessions had *reliably* helped to improve Mr. Carr's responses in relation to the behavioural subscale, the provocation index and thus the total score. This is in line with his temperament and expression score changes on

the STAXI. Mr. Carr's arousal subscale score almost met the criterion for reliable change and is reflective of his acquisition of emotion regulation skills. His cognitive score had shifted in the right direction, but not reliably so at the end of the 4 month long group. It is understandable that reliable cognitive change may take longer. An assessment of *clinical change* was not possible on the NAS-PI due to the absence of an established set of dysfunctional, or clinically comparable (psychiatric) norms.

Impulsivity

By the end of the group programme Mr. Carr's levels of overall impulsivity had slightly decreased but did not meet the clinical change threshold, nor the reliable change criterion. This change constituted a *reliable*, but *not clinically significant* change regarding his motor impulsivity, but undesired increases in both his cognitive and non-planning impulsivity. The group intervention incorporated a substantial amount of work encouraging learning about problem solving style and coping skills, so it is possible that these increases reflect an improvement in insight and perhaps honesty. If this was the case, the gains regarding motor impulsivity at this mid intervention stage are even more valuable.

At the overall conclusion of the 1:1 intervention, Mr. Carr had shown *clinically significant* and *reliable* reductions in his motor

and overall impulsivity. His cognitive impulsivity shifted substantially in the desired direction, especially after the increase reported at mid intervention, but was just on the cusp of being clinically significant, really only *reliable* in its change. Mr. Carr's non planning impulsivity score did not change at all. The primary difference between the first half of the intervention (group programme) and the latter (only 1:1) was having a focus on Mr. Carr's recognition and management of his delusional beliefs, or cognitive distortions during our 1:1 work. This individualised series of sessions could account for the improvement in Mr. Carr's ability to focus on the task at hand, along with his increase in thinking before acting.

Locus of Control

LOC

Mr. Carr's responses on this psychometric tool, measured at the beginning and end of the intervention, indicated a shift in the desired direction. This meant that he endorsed items which reflected a greater sense of an internal locus of control, reflecting a greater sense of ownership for his behaviour and acceptance of responsibility for the impact his actions have had on others. This reflects Mr. Carr at his best during times of fluctuating outlook.

IRI

Mr. Carr's responses on the IRI, measured at the beginning and end of intervention, indicate improved scores (change in the desired direction) on the perspective taking, fantasy and empathic concern subscales. Mr. Carr's personal distress score did not really change (1 point in the desired direction).

Self-Esteem

Rosenberg

Mr. Carr's self-esteem, found to be average at pre intervention, steadily increased further throughout the intervention. His character, as assessed before the intervention began, would suggest that it is possible this relates to narcissistic tendencies, consistent in his presentation. However, it is alternatively also possible that the intervention instilled a greater sense of genuine esteem as evidenced by an increased engagement in treatment and confidence in applying some of what he was learning. Importantly, Mr. Carr's self-esteem did not appear to decrease in response to an increase in self-reflection.

3.7 Discussion

Mr. Carr's violent behaviour was infrequent, but serious. It appeared to result primarily from a difficulty in the management of interpersonal relations and conflict. The distortion in his thinking style combined with certain less desirable characteristics i.e. a sense of entitlement and a violent attitude, provided him with the foundation for readily using violent behaviour. When this was compounded with symptoms of mental illness along with destabilisers such as the loss of his mother and a substantial increase in substance misuse, Mr. Carr's propensity towards violence increased. His ability to employ inhibiting strategies left him at risk of this escalating in severity.

The intervention in this case study was divided into group and 1:1 treatment. In combination they aimed to equip Mr. Carr with some of the problem solving and emotion regulation skills that are essential for him to avoid future violence in the presence of rising anger or interpersonal conflict for example. Mr. Carr was also provided with the opportunity to reflect on his cognitive style and develop strategies to help him when his thinking becomes automatic, or delusional. Ultimately, Mr. Carr was encouraged to take more responsibility for and control over the processes which have preceded violence in the past.

Upon completion of the group Novaco Anger Treatment Programme, Mr. Carr demonstrated some gains, particularly, in relation to his state anger. His trait anger scores had also begun to change in a positive direction. Mr. Carr acquired skills to better identify when his experience of anger was triggered, or increasingly, ways to reduce the arousal and prevent this from escalating into violent actions. He developed strategies to increase his likelihood of choosing an alternative solution to the problem. This work and change continued on a 1:1 basis after the group finished and this provided Mr. Carr with the opportunity to consolidate and further his learning. His post intervention assessment indicated that this enabled Mr. Carr to make longer term changes, typically those dependent on altering cognitions, including his locus of control, his ability to perspective take and both his motor and cognitive impulsivity.

The true extent of sustainable progress was hard to establish because of the infrequency of the observable behaviour, the external controls and support that were in place, and his removal from situations which were 'high risk' to him. His ability to deal with interpersonal conflict, in the absence of symptoms of mental illness, appeared to have improved and the frequency of passive aggressive behaviour appeared to reduce. It would have been really useful to be able to gain enough data from the other clinical staff working with Mr. Carr to observe this change

through an offence paralleling behaviour (Jones, L., 2011) framework. This was not feasible at the time the case study was conducted and has highlighted the need for psychiatric nursing staff to receive training in this area.

His insight into the role his peer group and antisocial culture played in facilitating his risk for violence improved over the last 6 months of the intervention, whilst in hospital, away from his typical lifestyle. This highlighted the importance of environmental and circumstantial factors in Mr. Carr's violent behaviour. Whilst this was a focus of the intervention there remained a strong likelihood that Mr. Carr would return to this role or seek the same role in a future peer group. Mr. Carr may have gravitated towards an antisocial culture even though he was describing not wanting to maintain this.

As his restrictions and monitoring naturally reduced in the community the extent of his progress would become evident. The fact that Mr. Carr recognised this was progress and his desire to return to the same situation reduced substantially in the last 6 months of the intervention. However, Mr. Carr displayed great difficulty in carrying out and maintaining determination to complete plans that he made for himself, which could have hindered his ability to put his new attitude and behaviour into practice.

3.8 Conclusions

Shifting Mr. Carr from a superficial engagement to something more meaningful took a substantial amount of the work, but the length of intervention (approx. 40 sessions) enabled this to happen successfully.

Ten months after the intervention began Mr. Carr was granted conditional discharge from hospital by the ministry of justice after steady improvement in his engagement with his MDT, his communication skills and his presentation on the ward. He was to be cared for under the 'Community Treatment Order' framework by a Community Forensic Team (CFT).

The intervention continued throughout this transition for a further three months. Mr. Carr coped with a number of potential destabilisers (becoming a father and moving house) through seeking appropriate support. He remained in the community without re-arrest/recall. Due to his cognitive difficulties he needed repeat reminders about his treatment order conditions and support to adhere to them. Mr. Carr began an assessment to potentially receive treatment through the personality disorder outpatient clinic.

The psychometrics completed at the end of the intervention detailed here showed improvements in various aspects of his emotional management, his perspective taking skills, his locus of

control and his impulsivity. Mr. Carr made some positive changes in his attitude towards violence. He continued to learn skills to deal with interpersonal conflict and improve his management of his anger. His insight appeared to show some improvement in respect of his risk for violence and his risk of relapse. Mr. Carr began to comprehend that a deterioration in his mental state was a disinhibiting factor in his risk for violence but was not necessarily causal. Importantly, he acknowledged that he had acted violently whilst not experiencing symptoms of mental illness. He also started to take responsibility for other aspects of his clinical presentation (personality traits, and anxiety) and lifestyle choices (drug use, peers, criminal activity), which he could exert some control over.

Chapter 4

An evaluation of the strengths and weaknesses of the HCR-20: Has the V3 advanced the risk assessment and management of mentally disordered offenders?

4.1 Abstract

Structured professional judgment approaches to risk assessment have dominated clinical practice in the last decade and look set to continue to be best practice for some time. Through the merging of actuarial tools and clinical opinion a flexible model of risk assessment and management developed. However, this is not without its disadvantages.

The HCR-20 V2 has been demonstrated to be empirically sound, but the transfer of these qualities into the realm of practice left users confused about whether they were predicting or formulating an individual's future risk for violence.

The development of the HCR-20 V3 appears to have addressed a number of the limitations that were holding the HCR-20 V2 back. It is now much clearer that the tool is a set of risk management guidelines with a central focus on formulation, but with an underpinning, solid empirical foundation. It is, however, essential that the empirical quality of this tool continues to be evaluated as its potential use and purpose varies from organisation to organisation. The manual should enhance the standardisation of its use, whilst retaining the flexibility which made the tool such a sought after measure.

4.2 Introduction

4.2.1 Overview

The 'actuarial tool' vs 'clinical judgement' dichotomy within the risk assessment of behaviour culminated in the emergence of the structured professional judgement (SPJ) approach. It became widely acknowledged that assessments solely using static factors were wholly improved by the addition of dynamic factors and clinical opinion and vice versa. The use of structured professional judgement tools, such as the HCR-20, therefore, became common practice. Yet based on the flexible nature of the approach, SPJs were used in a number of ways for different purposes.

4.2.2 Introduction

The Tool

The HCR-20 tool is part of the dynasty that is SPJ. It is a set of guidelines originally devised by Webster *et al*. in 1995, updated in 1997 to version 2; and to version 3 in 2013; to assist professionals with their risk assessments of an individual's likelihood for future violence. The name comes from its logical, evidence based, components; namely 20 factors of which 10 are historical 'H', 5 are clinical 'C' and 5 refer to future risk management 'R'. This has remained the same across the progressive versions of the tool.

In essence, there are steps to follow within these structured professional guidelines which enable the assessor to gather the required information, rate the evidence, develop a formulation, make judgments about risk, hypothesise some potential future outcomes and make clear the case management and treatment conditions in which these outcomes could potentially be prevented.

Potential Use

Regardless of the version of the tool, its intended purpose is for the legal or clinical evaluation of the risk for violence in men or women aged 18 years and older, institutionalised, or in the community, who have a mental disorder. The authors acknowledge the need to use this age bracket with some flexibility in cases, for example, whereby a 16 or 17 year old has left home and lived independently, or a 20 year old lives dependently with parents. There is supplementary guidance available for using the second version of the HCR-20 with both women (Female Additional Manual, Vogel *et al.* 2011) and those with an intellectual disability (ID guidance, Boer *et al.* 2010).

Its utilisation is vast, across a number of institutional and community settings, by criminal justice and health care professionals alike. It was designed primarily to aid decision making at any clinical admission, interim or discharge juncture,

or criminal justice system equivalents. Doing so, by providing an indication of current and future risk based on personal characteristics and situational/circumstantial risk factors present, or anticipated. Its design also enabled the assessor to structure risk management plans to curtail the proposed imminent, or most likely, violent scenario.

Therefore, depending on the infrastructure around the decision making, in some instances, the quantitative aspects of the HCR-20 have been focussed upon, with some institutions or individuals capitalising upon the predictive accuracy of the scoring system and categorical judgments. Other times, the qualitative components have been the centre of attention, with professionals choosing to draw benefit from the accumulation of a range of clinical opinions on formulation and the generation of plans to manage current and future risk.

Application in practice

This has meant it has been applied in a variety of ways. Some professionals have used it as a crude measure of change over time, throughout periods of institutional or community monitoring. Others have utilised it as the basis for treatment recommendations which are subsequently argued to be either essential, or desirable, to reduce risk and for an individual to move settings. Alternatively, some have employed the tool to

develop plans which need to be in place to manage an individual's risk in a given situation. This breadth has allowed the assessment tool to be used internationally across a variety of national systems and it is available translated in over 20 languages.

Its multi-function of 'prediction' and risk management strategy formation relies on professionals to select the most appropriate application of the tool for the setting and purpose, which could leave the tool vulnerable to inappropriate use. Despite the authors training professionals in its use and advocating best practice, it is likely that individuals and organisations will continue to implement it in a variety of ways, which may not always be ideal. Whilst they may not be ideal, the HCR-20 continues to be a structured professional judgment tool, which should arguably uphold both actuarial and clinical judgment components.

Aims of the appraisal

Therefore, to evaluate the quality of an SPJ tool it is important to consider both its quantitative and qualitative components. For example, whether a) it functions in the way it is set out to operate, b) whether the rating system has good inter rater reliability, c) if it outperforms or is comparable to other tools

attempting to measure the same concept, and d) if it has an appropriate level of predictive validity.

The HCR-20 V3 structured professional judgment tool has only been used for about 12 months and many organisations have made the transition from its predecessor V2 slowly. Therefore, there is currently not much research available, beyond what the authors share, demonstrating the empirical quality of V3. Additionally, changes to the proposed best practice for utilising the tool appear to be trying to adjust the culture of its use in practice, making the supposed purpose of V3 somewhat different to V2. Rather than compare the two versions of this tool, this appraisal sets out to review the above mentioned criteria for the HCR-20 version 2 and will additionally give due consideration to whether version 3, in theory, improves upon version 2's limitations. This appraisal will also consider if the authors' aims propel the tool in the current climate of risk management.

Definition of violence

The HCR-20 definition of violence, critical for using the tool as it was intended, is the "*actual, attempted, or threatened harm to a person or persons*." (p. 2, Webster *et al*. 1997). The manual gave further guidance on how this should be interpreted, including information to aid decisions of grey area behaviours. They intentionally aimed to be neither over inclusive or exclusive

in their definition, although they were clear that acts of harm towards self, or animals were not to be considered violent in this risk assessment tool.

4.3 Evaluation

4.3.1 Reliability

There are extensive numbers of studies examining the HCR-20 v2, many of whom have reported the inter rater reliability that they found to be around 0.80. This is a consistent finding in research (De Vogel & De Ruiter, 2005; Douglas & Webster, 1999; Gray *et al*., 2011).

However, in practice there are a number of factors which may affect the HCR-20's reliability. Using, or applying, the ratings of risk factor presence is perhaps not undertaken as consistently in practice. Institutions, teams, individuals using the tool do so in a wide range of settings and ways. Factors such as discipline, relationship to the client, sources of information or experience at risk assessment would possibly result in differing ratings. This might be especially true for junctures where a client is institutionalised but nearing progression and teams or individuals differ in their opinions on a client's progress and potential circumstances in the near future. The transferability of the inter rater reliability from research to practice highlights challenges (Vojt *et al.* 2013) and provides a rationale for moving away from using the scoring system.

4.3.2 Validity

Concurrent validity

Compared with other violence risk assessment tools, such as the VRAG, LSI, SIR or the PCL-R, the HCR-20 has demonstrated that it can perform equally well, if not outperforming them in mentally disordered and intellectually disabled samples (Douglas & Webster, 1999; Fitzgerald *et al*. 2013). This again, is a consistent finding supported by a meta-analysis of 88 studies including over 200,000 participants (Campbell *et al*., 2009) where the HCR-20's best performance was in predicting institutional violence. Such comparisons are, however, based on an assumption that the tools, whilst measuring violence, actually define this concept in a similar way.

Predictive validity

The capacity of the HCR-20 to accurately identify whether an individual will be a recidivist or not has consistently been shown to vary. Some studies have reported the predictive validity to range from 0.60-0.82 (Fitzgerald *et al*., 2013; Gray *et al*., 2011; O'Shea *et al*., 2013; De Vogel & De Ruiter, 2005; De Vogel *et al*., 2004). More specifically research has shown the AUC values to be 0.71 (Dahle, 2006), 0.69 (Cooke, Mitchie, & Ryan, 2001), 0.67 (Coid *et al.,* 2009), and 0.62 (Kroner & Loza, 2001). The AUC can range from 0 (a perfect negative prediction), to .50 (chance prediction) to 1.0 (a perfect positive prediction). Values

of .70 would be considered moderate to large and above .75 can be considered large (Zweig & Campbell, 1993). The 'receiver operator characteristic' (ROC) graph curve represents a trade-off between sensitivity and specificity and the area beneath it (AUC) can be taken as an index for interpreting the accuracy of the predictor (*Ibid*).

Many of the studies reporting on the predictive accuracy of the HCR-20 only utilised the individual and collective scores from items. Research is beginning to indicate that the most accurate predictors of future violence are the overall clinical risk judgements rather than the numeric value of the item scores (De Vogel & De Ruiter, 2005; Fitzgerald *et al*. 2013).

The discrepancy between the utility of the tool for research purposes and its application in practice, again raises an issue. The HCR-20, when used as per best practice, advocates management plans which are actioned and which externally constrain an individual and impact upon their otherwise natural course of action. This may affect the likelihood of subsequent incidents of violence (Thomson *et al*. 2008; Vojt *et al*. 2013), thus the accuracy of the stated predictive validity.

Discriminatory Power

Earlier studies were suggestive of the HCR-20 having some discriminatory power. Douglas & Webster (1999) demonstrated that scores over the median in their study increased the odds of

various measures of past violence and antisocial behaviour by four times.

However, since then a number of researchers have demonstrated that the HCR-20's predictive validity is affected by moderating factors such as mental disorder, cognitive functioning and substance abuse (Gray *et al.* 2011), or gender (De Vogel & De Ruiter, 2005). Therefore, it may not have as much discriminatory power as first thought.

The limitations of V2

The limitations of the HCR-20 centre on its transferability from research into practice. When examining the research evidence it appears to have a robust evidence base for being reliable and valid even when taking into account slight variations in findings.

This provides, potentially, a false sense of security about its quality as a predictive risk assessment tool in practice. However, if the user of the tool does not intend to infer what an individual will or will not be likely to do, for the purpose of important decision making for example, then this perhaps is less relevant. It is important that users refer to and understand the relevant research, and its shortcomings, for their intended application of the tool. For example, there are clear implications for prospective studies regarding control groups and the ethics of withholding interventions, or for retrospective studies whereby

the undertaking of the assessments may have varied significantly.

The limitations of the tool as a risk management approach are minimal in comparison and tend to relate much less to the tool and more to the accuracy of the application of the process. Within the tool, the requirement of very specific diagnostic tools for personality disorder and psychopathy limits the amount of detail included and certainly does not enhance the practice of formulation at the end of data collection. The existence of the 'presence' scoring category is somewhat redundant also, because utilising it when the intention is risk management planning gives way to potentially biasing the resulting formulation.

The development of V3

The updating of V2 to V3 has been conducted over a prolonged period of time. This appears to be a consequence of a stringent process of evaluation involving analytical, clinical and empirical stages.

An attempt has been made to provide more detail in the manual, with greater guidance regarding what to include within the definition of each item; and what time periods to consider for each of the 'H', 'C' and 'R' sections. The definition of violence has remained the same, but the structure of the V3 proactively

encourages the user to capture the chronicity of violence across the lifespan and to focus on what is relevant to violence.

The authors felt that a substantial amount of change had occurred with regards to the conceptualisation of personality disorder and psychopathy and they responded to this by combining these two items. Likewise, they felt some items attempted to capture too many dimensions of a risk factor, so decided to split these items to cover the content more proportionally.

4.4 Conclusions

4.4.1 Has V3 improved upon V2?

Preliminary studies are suggesting that the HCR-20 V3 has the same empirical standards as V2 (De Vries Robbe & De Vogel, 2010; Douglas *et al.* 2010). There is also evidence that the authors are perhaps right to move away from a scoring system, towards a focus on formulation and overall summary risk judgments (Heilbrun *et al.* 2010). The overall judgements adding incremental validity suggests that the tool is being well used as a formulatory, risk management approach because it is indicative of clinicians using their judgment to add weight to, or minimise the impact of certain items, with success.

The sub items introduced for certain items encourage thinking about not only the presence of endorsing attitudes or behaviours, but also the absence of them. This should aid the process of weighting an item's relevance because it provides a more complete perspective on the individual's situation on a sliding scale and discourages dichotomous category selection. For example, instead of absorbing assumptions from the presence of a mental illness, that it is automatically relevant to risk in a sweeping statement format, the V3 encourages the user to write about the specific symptoms and their relevance, or not, to this individuals violence. Similarly, the new guidance in the

form of item indicators should help to standardise variations in thought processes relating to what each item is trying to capture.

Despite the relationship between psychopathy and violence, many assessments using V2 would have the psychopathy item omitted. Combining psychopathy with personality disorder is reflective of the current conceptualisations of these disorders and may reduce the number of omitted items as the psychopathy component can be used only when necessary. It can now also be referred to without the PCL-R assessment which is of greater utility to the formulation process.

4.4.2 How could the V3 be further improved?

The authors of V3 have clearly acted upon the evidence presented from a decade of research using the tool and they have extensively explored various avenues for change and have seemingly listened to feedback on their initial changes.

Future research into the predictive validity of the tool needs to account for and compare individuals who are purely assessed, with those who also receive management plans and corresponding intervention. Studies would ideally continue to test the incremental value of the summary judgments and potentially explore how accurate the scenario planning is at predicting the level or imminence of future violence.

Chapter 5 Thesis Discussion

Firstly, the systematic review of the literature that has previously examined the association between delusional thinking and violence, highlighted overwhelming support for a positive relationship amongst the best quality studies. This relationship was best understood in relation to persecutory or threat related delusional beliefs. However, gender appeared to moderate the association, with males demonstrating a positive relationship, but women a negative relationship. This could have had a large impact on the results from a number of the studies which potentially would have directed the association to be even stronger for males. It would be useful to see gender specific research in this area in the future.

The empirical exploration of delusional beliefs in a personality disordered population sought to examine whether the concept of delusional thinking extended to this population on the basis that they do experience transient psychotic symptoms, much like other non-psychotic disorders, or even the general population. Personality disordered individuals appeared to experience a level of delusional thinking similar to that of the general population. However, the presence of lifetime delusional thinking was considerably higher amongst those with the most severe presentations of personality disorder and those who had

committed the most severe levels of violence, but not the greatest quantity of lifetime violence. Delusional thinking, PD severity and violence severity were significantly intercorrelated. The scope, or size, of the study unfortunately did not reach to examining whether delusional thinking mediated or moderated the relationship between PD severity and violence severity; but it would be useful if future research examined this.

A case study of a man experiencing comorbid schizophrenia with borderline and antisocial personality disorder examined how delusional beliefs exacerbated an already existing tendency to become angry and violent. It explored the effectiveness of a CBT based group and 1:1 psychological intervention in reducing the prominence and maintenance of these beliefs and the distress associated with them. In addition, the provision of problem solving and emotion regulation strategies were utilised with a view to reducing the likelihood of future serious violence.

Finally, the HCR-20 risk assessment for future violence was examined to consider its applicability within a model of planning, treating and managing changes in risk. The most recent changes to the tool were considered with respect to the findings from the previous chapters. The new, HCR-20 V3 appears to aid formulation and optimises the ability of clinicians to consider

individual symptoms such as delusions when evaluating the relevance of these to risk for violence.

The systematic review, the empirical study and even the case study have all highlighted the difficulty with examining more closely the connection between delusional thinking and violent behaviour. Teasing these apart, measuring these reliably and establishing proximity and direction between them is very difficult; but very important for future investigations. Exploring the proximity between the delusional thinking and the violent actions would help to understand the overall delusional experience including the emotional response and the processing and management of these. If, as suggested in previous research and the case study here, anger plays a mediating role between these experiences, then future studies could explore what other factors; such as rumination, emotionality, impulsivity, thresholds for stress, or other metacognitive deficits, contribute to the likelihood that experiencing delusional thoughts might result in violence. An exploration of these subtleties may also help to understand gender specific variations in the pathway from delusional thinking to violence.

The systematic review findings related to psychiatric and general populations; and the research study explored a PD population. The case study, albeit one individual, has reinforced that those

with comorbid mental illness and disorder are also therefore susceptible to experiencing difficulties with delusional thinking; and it would be interesting to explore how a comorbid population fare in comparison. Likewise, having a large enough sample to examine PD by type, or cluster with regards to delusional thinking may help us to develop ideas about which combination of traits represents the most severe PD presentation and therefore who may be at greatest risk of severe violence. Such information is in line with proposals for the ICD-11 to abandon PD categories for a dimensional measure of severity. This is also crucial to good risk management and treatment and is central to the usefulness and effectiveness of such formulations within tools like the HCR-20 V3.

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Appendices

Appendix A – Systematic Review Search Strategy

PICO

Adult Males or Mixed Male/Female Aged 18+

Who have experienced delusions (or synonyms)

Associated (or synonyms) or not WITH

Violent (or synonyms) behaviour

Databases (Searches conducted July 2013)

Psychinfo 1806 to July Week 3 2013 (Limit 1990)

Embase 1980 to June 2013 (Limit 1990)

Medline 1946 to July Week 4 2013 (Limit 1990)

CINAHL (1990+)

BNI (1990+)

ASSIA (1990+)

Proquest (1990+)

Web of science (1990+)

EMBASE

1990+

1. delusion* delusion*.mp. 16,536/13,641
2. paranoi* paranoi*.mp. 15,101/ 10,637
3. grandios* grandios*.mp. 1085/971
4. persecut* persecut*.mp. 2569/1975

5. religio* religio*.mp. 63,749/50,890
6. delusions of grandeur delusions of grandeur.mp. 37/25
7. delusions of guilt delusions of guilt.mp. 16/13
8. delusions of catastrophe delusions of catastrophe.mp. 1/1
9. delusions of parasitosis delusions of parasitosis.mp. or delusional parasitosis/ 274/241
10. delusional idea* delusional idea*.mp. 298/264
11. delusional beliefs delusional beliefs.mp. 222/206
12. delusional misidentification delusional misidentification.mp. 296/274
13. delusional disorder delusional disorder.mp. 1533/1503
14. delusional therioanthropy delusional therioanthropy.mp. 1/1
15. capgras capgras.mp. 631/450
16. fregoli fregoli.mp. 96/87
17. cotards cotards.mp. 130/102
18. clerambaults clerambaults.mp. 65/42
19. folie a deux folie a deux.mp. or shared psychotic disorder/ 408/325
20. erotomania erotomania.mp. or erotomania/ 285/219
21. othello syndrome othello syndrome.mp. or jealous delusion/ 164/157
22. threat control over* threat control over*.mp. 18/18
23. TCO TCO.mp. 466/369 **Total 76,647**
24. violen* violen*.mp. 58.510/52,232
25. aggressi* aggressi*.mp. 179,290/158,223
26. hostil* hostil*.mp.13,996/11,545

27. assault* assault*.mp.12,029/10,753 **Total 218,520**

28. associat* associat*.mp. 3544690 /3216278

29. correlat* correlat*.mp. 1482184/ 1287471

30. related related.mp. 1841927 /1631931

31. relationship relationship.mp. 806594/ 678724

32. link* link*.mp. 895673/ 814651 **Total 5806948**

Combind = **2818**

ASSIA

1990+

delusion* OR paranoi* OR grandios* OR persecut* OR religio* OR delusions of grandeur OR delusions of guilt OR delusions of catastrophe OR delusions of parasitosis OR delusional idea* OR delusional beliefs OR delusional misidentification OR delusional disorder OR delusional therioanthropy OR capgras OR fregoli OR cotards OR de clerambaults OR folie a deux OR erotomania OR othello syndrome OR threat control over* OR TCO

violen* OR aggressi* OR hostil* OR assault*

associat* OR correlat* OR related OR relationship OR link*

ab(delusion* OR paranoi* OR grandios* OR persecut* OR religio* OR delusions of grandeur OR delusions of guilt OR delusions of catastrophe OR delusions of parasitosis OR delusional idea* OR delusional beliefs OR delusional misidentification OR delusional disorder OR delusional therioanthropy OR capgras OR fregoli OR cotards OR de clerambaults OR folie a deux OR erotomania OR othello

syndrome OR threat control over* OR TCO) AND ab(violen* OR aggressi* OR hostil* OR assault*) AND ab(associat* OR correlat* OR related OR relationship OR link*)

Combined =279

Psychinfo

1990+

1. delusion$ delusion$.mp. or exp Delusions/ 11,684/7884
2. paranoi$ 12,280/6631
3. grandios$
4. persecut$
5. religio$ 61,700/41,184
6. delusions of grandeur 88/33
7. delusions of guilt delusions of guilt.mp. 24/15
8. delusions of catastrophe delusions of catastrophe.mp. 1/1
9. delusions of parasitosis delusions of parasitosis.mp. 30/19
10. delusional idea$ delusional idea$.mp. 343/241
11. delusional beliefs delusional beliefs.mp. 307/269
12. delusional misidentification delusional misidentification.mp. 226/211
13. delusional disorder delusional disorder.mp. 638/599
14. delusional therioanthropy delusional therioanthropy.mp. 0/0
15. capgras 466/328
16. fregoli 83/67
17. cotards 101/81
18. de clerambaults 51/30

19. folie a deux 287/133

20. erotomania 248/157

21. othello syndrome 22/18

22. threat control over$ 24/23

23. TCO 20/19 **Total /56,023**

24. violen$ 61371/53825

25. aggressi$ 65,767/45,268

26. hostil$ 17,969/11,580

27. assault$ 10,505/8529 **Total 135,982/103,316**

28. associat* 490322/412401

29. correlat* 262,256/190,129

30. related 442,662/361,698

31. relationship 353221/268384

32. link* 121283/107290 **Total 1243082/ 968069**

Combined = **2560**

MEDLINE

1990+

1. delusion$ delusion$.mp. or Delusions/ 10,190/6985

2. paranoid delusion$ paranoid delusion$.mp. 253/194

3. delusions of paranoia delusions of paranoia.mp. 17/17

4. grandiose delusions grandiose delusion$.mp. 53/42

5. delusions of grandeur delusions of grandeur.mp. 26/15

6. persecutory delusion persecutory delusion.mp. 27/26

7. delusions of persecution delusions of persecution.mp. 74/50

8. religio$ religio$.mp. 43859/31,578

9. delusions of guilt delusions of guilt.mp. 15/12

10. delusions of catastrophe delusions of catastrophe.mp. 1/1

11. delusions of parasitosis delusions of parasitosis.mp. 111/78

12. delusional idea$ delusional idea$.mp. 222/190

13. delusional beliefs delusional beliefs.mp. 154/142

14. delusional misidentification delusional misidentification.mp. 152/133

15. delusional disorder delusional disorder.mp. 434/407

16. delusional therioanthropy delusional therioanthropy.mp. 0/0

17. capgras capgras.mp. 520/326

18. fregoli fregoli.mp. 53/42

19. cotards cotards.mp. 79/58

20. de clerambaults de clerambaults.mp. 35/16

21. folie a deux folie a deux.mp. or Shared Paranoid Disorder/ 329/144

22. erotomania erotomania.mp.153/99

23. othello syndrome othello syndrome.mp. 20/14

24. threat control over$ threat control over$.mp. 13/13

25. TCO TCO.mp. 557/475
Total 38,444

26. violen$ violen.mp. 44,195/38,615

27. aggressi$ aggression.mp. or Aggression/ 33,956/22,540

28. aggressive behav$ aggressive behav$.mp. 9557/7879

29. hostil$ hostility.mp. 7280/4878

30. assault$ assault$.mp. 8666/7568

Total 68,789

31. associate$ 2750738/ 2397486

32. correlate$ 1173671/ 965516

33. related 1603067/ 1363391

34. relationship 1148964/ 899716

35. link$ 745066/ 654350

Total 4,776,777

Combined = 779

CINAHL

Cumulative Index to Nursing and Allied Health Literature

1990 to present

delusion* OR paranoi* OR grandios* OR persecut* OR religio* OR delusions of grandeur OR delusions of guilt OR delusions of catastrophe OR delusions of parasitosis OR delusional idea* OR delusional beliefs OR delusional misidentification OR delusional disorder OR delusional therioanthropy OR capgras OR fregoli OR cotards OR de clerambaults OR folie a deux OR erotomania OR othello syndrome OR threat control over* OR TCO

delusion* OR paranoi* OR grandios* OR persecut* OR religio* OR delusions AND of AND grandeur OR delusions AND of AND guilt OR delusions AND of AND catastrophe OR delusions AND of AND parasitosis OR delusional AND idea* OR delusional AND beliefs OR delusional AND misidentification OR delusional AND disorder OR delusional AND therioanthropy OR capgras OR fregoli OR cotards OR de AND clerambaults OR folie AND a AND deux OR erotomania OR othello AND syndrome OR threat AND

control AND over* OR TCO).ti,ab [Limit to: Publication Year 1990-2013]

= **8965**

violen* OR aggressi* OR hostil* OR assault*

(violen* OR aggressi* OR hostil* OR assault*).ti,ab [Limit to: Publication Year 1990-2013]

= **30,687**

associat* OR correlat* OR related OR relationship OR link*

(associat* OR correlat* OR related OR relationship OR link*).ti,ab [Limit to: Publication Year 1990-2013]

= **460,888**

Combined = 357

BNI

British Nursing Index

1992 to present

delusion* OR paranoi* OR grandios* OR persecut* OR religio* OR "delusions of grandeur" OR "delusions of guilt" OR "delusions of catastrophe" OR "delusions of parasitosis" OR "delusional idea*" OR "delusional beliefs" OR "delusional misidentification" OR "delusional disorder" OR "delusional therioanthropy" OR capgras OR fregoli OR cotards OR "de clerambaults" OR "folie a deux" OR erotomania OR othello syndrome OR "threat control over*" OR TCO

(delusion* OR paranoi* OR grandios* OR persecut* OR religio* OR delusions AND of AND grandeur OR delusions AND of AND guilt OR delusions AND of AND catastrophe OR delusions AND of AND parasitosis OR delusional AND idea* OR delusional AND beliefs OR delusional AND misidentification OR delusional AND disorder OR delusional AND therioanthropy OR capgras OR fregoli OR cotards OR de AND clerambaults OR folie AND a AND deux OR erotomania OR othello AND syndrome OR threat AND control AND over* OR TCO).ti,ab [Limit to: Publication Year 1990-Current] = **3**

violen* OR aggressi* OR hostil* OR assault*

(violen* OR aggressi* OR hostil* OR assault*).ti,ab [Limit to: Publication Year 1990-Current] = **2421**

associat* OR correlat* OR related OR relationship OR link*

(associat* OR correlat* OR related OR relationship OR link*).ti,ab [Limit to: Publication Year 1990-Current] = **23,092**

AND = 0

AMED

Allied and Complementary Medicine 1990 –present

(delusion* OR paranoi* OR grandios* OR persecut* OR religio* OR delusions AND of AND grandeur OR delusions AND of AND guilt OR delusions AND of AND catastrophe OR delusions AND of AND parasitosis OR delusional AND idea* OR delusional AND beliefs OR delusional AND misidentification OR delusional AND disorder OR delusional AND therioanthropy OR capgras OR fregoli OR cotards OR de AND clerambaults OR folie AND a AND deux OR erotomania OR othello AND syndrome OR threat AND control AND over* OR TCO).ti,ab = **15**

The Cochrane Review Library = 0

NCJRS

1990+

ab(delusion* OR paranoi* OR grandios* OR persecut* OR religio* OR delusions of grandeur OR delusions of guilt OR delusions of catastrophe OR delusions of parasitosis OR delusional idea* OR delusional beliefs OR delusional misidentification OR delusional disorder OR delusional therioanthropy OR capgras OR fregoli OR cotards OR de clerambaults OR folie a deux OR erotomania OR othello syndrome OR threat control over* OR TCO) AND ab(violen* OR aggressi* OR hostil* OR assault*) AND ab(associat* OR correlat* OR related OR relationship OR link*) = **464**

Web of Knowledge

1990+

delusion* OR paranoi* OR grandios* OR persecut* OR "religious delusions" OR "delusions of grandeur" OR "delusions of guilt" OR "delusions of catastrophe" OR "delusions of parasitosis" OR "delusional idea*" OR "delusional beliefs" OR "delusional misidentification" OR "delusional disorder" OR "delusional therioanthropy" OR capgras OR fregoli OR cotards OR "de clerambaults" OR "folie a deux" OR erotomania OR othello syndrome OR "threat control over*" OR TCO = **60,280**

violen* OR aggressi* OR hostil* OR assault* = **771,173**

associat* OR correlat* OR related OR relationship OR link* = **27,916,241**

AND = 1,546

Appendix B – Quality Assessment and Extraction Form

First author	Journal/Theses, Conference Proceeding, Unpublished thesis etc.	Year

Study Design	
State here the type of study and the primary aim of the research	***Design (circle)***
	Review
	Experimental
	Case Control
	Cohort
	Cross Sectional
	Case Study
	Correlational
	Other (Qual/MixMeth)

Population	
How was the study sample recruited?	Notes:
Was the population of the study clearly defined in terms of:	

Age	Yes/No/Unclear	Notes:
Gender	Yes/No/Unclear	Notes:
Ethnicity	Yes/No/Unclear	Notes:
Mental Health	Yes/No/Unclear	Notes:
Socioeconomic Status	Yes/No/Unclear	Notes:
Was a control population used? If so, was the control group similar in terms of age, gender, location, ethnicity, mental health, socioeconomic status?	Yes/No/Unclear/Not applicable	Notes:
Were withdrawals/drop-outs described?	Yes / No/Unclear	Notes:

Delusions		
Were delusions clearly defined?	Yes /No/Unclear	Notes:
Were delusions categorised (e.g. persecutory, threat control override, etc.)	Yes /No/Unclear	Notes:

Were delusions measured utilising a standardised format (e.g. DSM-IV, MADS etc.)?	Yes /No/Unclear	Notes:

Violence		
Was violence clearly defined?	Yes / No/Unclear	Notes:
Were different categories of violence utilised (e.g. mild, moderate, severe)?	Yes / No/Unclear	Notes:
Was a standardised psychometric measure of violence used?	Yes / No/Unclear	Notes:
Was the data source(s) used to measured violence defined (e.g. observational data, self-report, file records etc.)?	Yes / No/Unclear	Notes:

Moderating Factors		
Were moderating factors considered?	Yes / No/Unclear	Notes:
Substance Misuse	Yes / No/Unclear	Notes:
Other Mental Health Conditions (e.g. PD, LD, OCD, etc.)	Yes / No/Unclear	Notes:

Data Analysis		
Was the data analysis process clearly defined?	Yes / No/Unclear	Notes:
Were parametric or non-parametric tests used?	Parametric/ Non-parametric/Unclear	Notes:

Other Relevant Information		
What was the time period which the study focussed on?	<6 months 6 - 12 months >12 months Unclear	Notes:
Was the source of the research funding identified?	Yes / No/Unclear	Notes:
Were any other conflict(s) of interests declared?	Yes / No/Unclear	Notes:

Overall Judgement of Quality	
Is the study of high enough quality to warrant inclusion in the review?	Yes/No/Maybe Reason for Decision:

Appendix C – Table of Excluded Studies

Study	N	Type of Study	Aim	Population (Country)	Gender	Age in Years (S.D.)	Reason for Exclusion
Beal (2003)	57	Correlational	Examine the relationship between psychopathy and degree of victim violence	Consecutive admissions to Millhaven Assessment Unit (Canada)	100% M	Average age at admission = 29 (8.04)	Delusions poorly defined merely a category called "*perception of external control*"
Beck (2004)	116	Cross Sectional	To learn how delusions, violence and substance abuse are related	Hospitalised patients who had been violent in the community (USA)	90% M 10% F	Median = 40.9	No statistical analysis simply a presentation of prevalence percentages
Cookson (2012)	79	Cohort	Examine the relationship between interpersonal style, perceived coercion and psychiatric symptoms	Acute inpatients at the Alfred Hospital in Victoria (Australia)	54.4% M 45.6% F	Average = 40, range 24-46	No definition of violence nor did it explore subtypes of violence.
Daffern (2005)	110	Epidemiological	Examines the relationship between characteristics of psychiatric inpatients with aggressive behaviour	Inpatients from the secure forensic Thomas Embling Hospital (Australia)	43.6% M 56.4% F	Mean = 34.5 (12.6)	Study too broad with too many factors considered. The measure of delusions was not particularly rigorous.
Eustace, Kidd, Greene, Fallon,	150	Correlational	To determine the clinical, functional and neuropsychological	Client attending a memory clinic were recruited and	Verbal agg 45% M, 55%	Mean = 76.5 (8.26)	No violent or physical aggression, rather it was verbal aggression and agitation.

Bhrain, Cunningham, Coen, Walsh, Coakley and Lawlor (2001)			correlates of verbal aggression amongst elderly with AD	assessed on a variety of variables (Ireland)	F; Non-agg 27% M, 73% F		
Freeman, Garety, Kuipers, Fowler, Bebbington and Dunn (2007)	100	Cohort	Aimed to examine the prevalence and correlates of safety behaviours related to persecutory delusions	Psychiatric in and outpatients from the Psychological Prevention of Relapse in Psychosis Trial (UK)	69% M 31% F	Mean = 40 Range 18-65	Authors quoted "*We did not attempt to understand violence as a response to delusions*".
Hodelet (2001)	175	Cross Sectional	Aimed to ascertain features in the hospital population that linked mental illness and offending.	Psychiatric inpatients in high secure hospital (Canada)	87% M 13% F	Mean = 38 Range 19-75	Did not define, categorise or measure delusions well.
Holroyd, Currie and Abraham (2006)	155	Cross Sectional	Examine the presence of aggressive behaviours. Compare aggressive with non-aggressive psychogeriatric patients	Psychogeriatric patients referred to an elderly community outreach project (USA)	26% M 74% F	Mean = 76.6 (8.27)	Did not define, categorise or measure delusions well.
Humphreys, Johnstone, MacMillan and Taylor (1992)	253	Case series	Explore dangerous behaviour prior to first admission to hospital	Northwick Park study of first episode schizophrenics (UK)	67.3% M 32.7% F	Mean = 26, range 18-50	No parametric analysis simply definition of groups by demographic data. Obvious opportunity to statistically compare violent and non-violent group missed.

Junginger, Parks-Levy and McGuire, (1998)	54	Cross Sectional	Examine the extent to which delusions motivate violent behaviour among psychiatric patients	Patients from short-term psychiatric wards in Louisiana (USA)	59.3% M 40.7% F	Mean = 38.7 (14)	Poor quality study lacking any clear data analysis. Reliant on the self-report of patients, many of whom were experiencing persecutory delusions. No inclusion of any confounding variables.
Kennedy (1992)	15	Case series	Explore the hypothesised link between negative affect associated with delusions and violence	Patient admitted to a regional secure unit serving the South East of England (UK)	93.3% M 6.7% F	Mean age at offence = 34.9, range 23-45	The study explores the relationship between delusions and action but not necessarily violence. Very small sample size and a lack of statistical analysis.
Kienlen, Birmingham, Solberg, O'Regan and Meloy (1997)	25	Case Control	Comparative study of psychotic and non-psychotic stalkers	Cases involving the forensic examiners in Kansas City (USA)	84% M 16% F	Mean = 38 Range 24-69	Very small sample size and with some cases having missing data it made statistical comparisons very more difficult
Krakowski and Czobor (1997)	137	Case Control	Identify psychiatric symptoms, neurological impairments, and situational factors associated with violence	Newly admitted inpatients on eight admission wards in two psychiatric hospitals (USA)	Violent 61.8% M, 38.2% F; Non-violent 51.2% M 48.8% F	Violent mean = 32.1 (9.6); non-violent mean = 34.0 (8.7)	Despite good assessment of violence, general psychotic symptoms rather than delusions measured. Not delusions subscale within this measure
Lachs et al. (1992)	114	Epidemiological	Compare cognitive functioning and prevalence of selected behaviour in delusional and non-delusional dementia	Consecutive patients at the Dorothy Adler Geriatric Assessment Centre (USA)	34.2% M 65.8% F	Mean = 77.8	Aggressive outbursts, such as refusing help from caregivers, rather than violence measured

			patients				
Leonard, Tinetti, et al (2006)	103344	Cross Sectional	Identify the modifiable resident characteristics that are associated with physical aggression	All nursing home residents in five states: California, NY, Ohio, Pennsylvania, Texas (USA)	24.1% M 75.9% F	Mean = 84	Delusions very poorly defined, study very broad in its scope with delusions being a very small part of it. Despite aggression being the primary covariate it was also poor defined and measured
Lopez (1991)	34	Case Control	Longitudinal evaluation of neuropsychological functioning, rate of progression in AD	Volunteers recruited from the University of Pittsburgh hospitals (USA)	Not specified	Exp Mean = 68.0 (7.5), Control Mean = 71.2 (6.7)	Not enough focus on measures of violence or aggression. Small sample size made statistically meaningful comparisons very difficult.
Lyketsos and Steele et al (1999)	541	Epidemiological	Determine the frequency of aggressive behaviour in community residing dementia patients	Consecutive series of outpatients referred to the John Hopkins Neuropsychiatry and Memory Group (USA)	41% M 59% F	Mean = 75.5 (9.8)	The remit of the study was too broad with delusions only a very small part of the study. Delusions were not differentiated into different categories
McNiel, Eisner, & Binder (2000)	103	Correlational	Describe the relationship between command hallucination and violent behaviour	Short-term psychiatric inpatient unit at a university hospital (USA)	59.2% M 40.8% F	Mean = 40.7 (13.6)	Command hallucinations and not delusions were the focus of this study.
Mizrahi (2006)	771	Epidemiological	To determine whether anosognosia, depression and elevated mood are associated with	Consecutive series of outpatients who attended a dementia clinic (Argentina)	Not specified	Mean = 71.1 (8.3)	Violence was not clearly defined or measured, simply a score on an irritability assessment.

			delusions in AD				
Mojtabai (2006)	38,132	Prospective Survey	Aimed to examine the association of 'psychotic-like' experiences with violence.	General population, National Household Survey on Drug Abuse (USA)	Not specified	18+	Poorly detailed/not detailed definitions of delusions, psychotic-like experiences nor violence.
Nolan (2005)	157	Observational	Prospective monitoring of aggressive behaviour and psychopathology to determine any association between the two.	Inpatients held in 4 different hospitals across NY and N. Carolina (USA)	Not specified	Range 18-60	Measure of psychopathology, the PANSS had scores grouped together so no specific measure of delusions used.
Nordstrom (2006)	48	Epidemiological	Identifying the possible triggering factors related to victim relations	All schizophrenic homicide offenders in Sweden convicted between 1992-2000 (Sweden)	100% M	Mean = 32.2 (9.6), range 19-58	Researchers did not separate delusions and hallucinations. TCO was based on self-report but not well defined.
Rogers, Watt, et al. (2002)	110	Case Control	Explored the relationship between command hallucinations and violence towards self or others	Psychiatric patients in a medium security hospital (UK)	88% M 22% F	Median = Male 33 Female 33	Paranoid delusions included as a secondary variable and the definition and measurement of this was not clear.
Rosenfeld & Harmon (2002)	204	Correlational	Identify the correlates of talking and violent behaviour	Stalking and harassment court cases referred for	82.9% M 17.2% F	Mean = 38.8 (10.4)	Study was too broad as delusions were only one variable among so dozens. Delusion grouped into "yes"

				mental health evaluation in NY between 1994 and 1998 (USA)			or “no”.
Silva et al. (1998)	20	Case series	Examination of the characteristics of patients with delusional jealousy	Participants evaluated by the authors between 1990 and 1995 in hospital and locked forensic psychiatric facilities (USA)	95% M 5% F	Mean = 47.9	No clear measurement of violence or delusions. No statistical examination of the relationship between delusions and violence.
Soyka (2011)	14,309	Epidemiological	Study of the prevalence of delusional jealousy among psychiatric patients	All patients admitted to psychiatric hospital in Munich between Jan 2000 and Dec 2008 (Germany)	49.5% M 50.5% F	Mean = 47.1	Main focus of the study was prevalence of delusional jealousy not it relationship with violence. Compared rates of violence based on a single item of an assessment of psychiatric symptoms. Compared delusional sample with whole sample which also included the delusional individuals.
Steadman et al (2000)	939	Validation of Actuarial Risk Assessment	Use of a classification tree rather than main effects regression to enhance actuarial risk assessment	Data from the MacArthur Violence Risk Assessment. Hospitalised patients followed up 20 weeks after discharge (USA)	57.3% M 42.7% F	Mean = 29.9 (6.2)	Study too broad with 134 variables considered.
Swanson,	262	RCT	To test whether	Patients with	53.4% M	Range 18-	Delusions were not thoroughly

Swartz, Borum, Hiday, Wagner, & Burns (2000)			involuntary outpatient commitment may help to reduce the incidence of violence amongst persons with SMI	psychotic or major mood disorder and history of hospital recidivism (USA)	46.6% F	65	measured; a TCO subscale was constructed from a few BSI items. Not a clear enough focus on the relationship between delusions and violence.
Swanson, Swartz, van Dorn, et al. (2006)	1410	Epidemiological	Prevalence and correlates of violence among schizophrenics	Data from the National Institute of Mental Health CAITE PROJECT (USA)	74.3% M 25.7% F	Mean = 40.5, range 18-65	Study too broad looking at a number of factors, of which positive symptoms including delusions, were included.
Thomas et al (2005)	708	RCT	Assess the ability of different statistical approaches in predicting risk of violence	Data derived from the UK700 study (UK)	57% M 43% F	Mean = 38 (11.64), range 17-65	TCO was the only delusion explored as one of many covariables. It was unclear how TCO was assessed or quantified.
Tiihonen, Isohanni, Rasanen et al (1997)	10,853	Cohort	Examine the quantitative risk of criminal behaviour associated with specific mental disorders	1966 Northern Finland birth cohort (Finland)	51.9% M 48.1% F	Cohort study so all 30-31 at time of publication	Study was too broad with delusions not specifically measured, defined, or analysed. Reliance on violent conviction rather than incidences of violence.

Appendix D – Peter's Delusion Inventory 21-item

Schizophrenia Bulletin, Vol. 30, No. 4, 2004

Appendix

P.D.I.-21

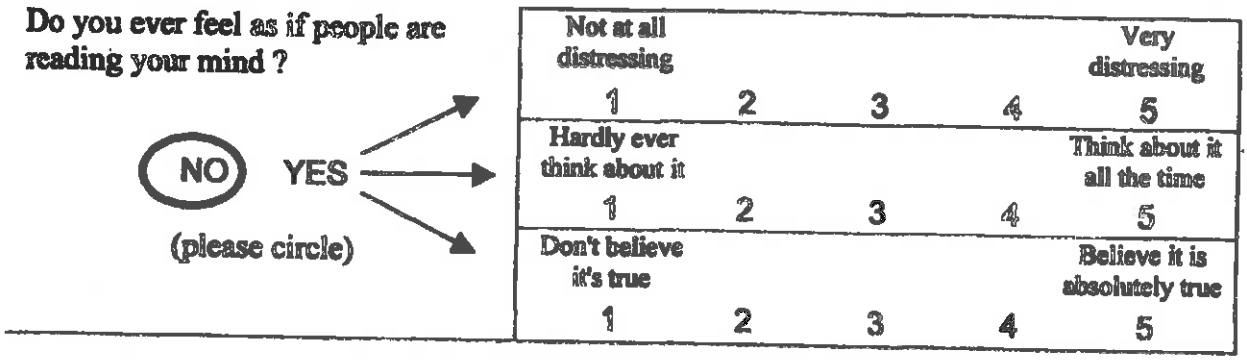
This questionnaire is designed to measure beliefs and vivid mental experiences. We believe that they are much more common than has previously been supposed, and that most people have had some such experiences during their lives. Please answer the following questions as honestly as you can. There are no right or wrong answers, and there are no trick questions.

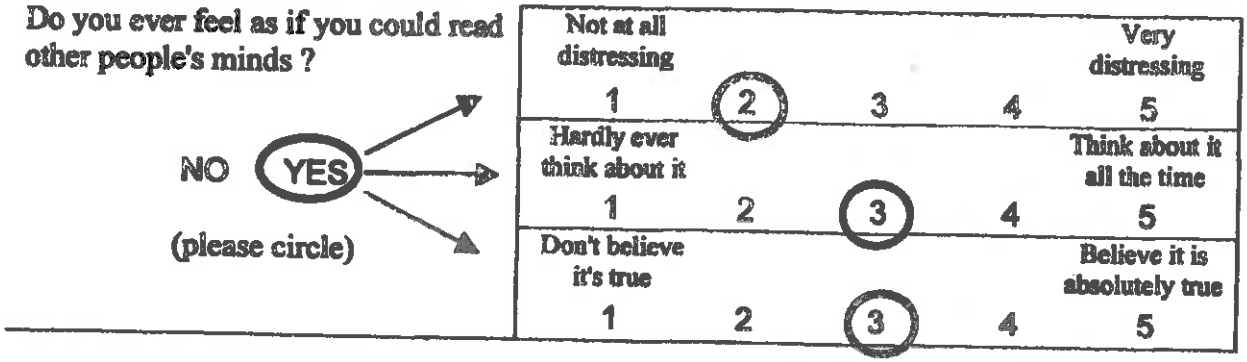
Please note that we are NOT interested in experiences people may have had when under the influence of drugs.

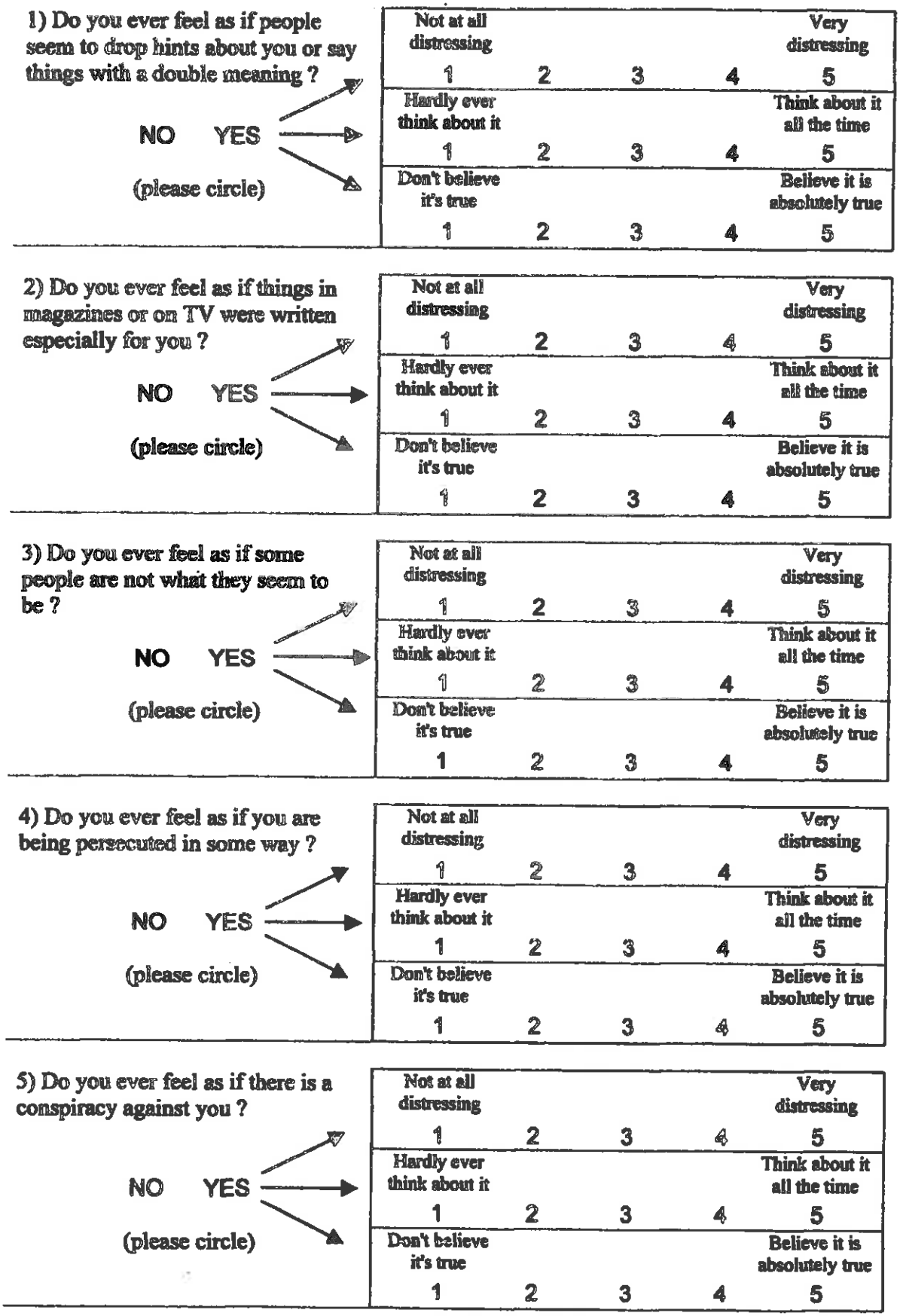
IT IS IMPORTANT THAT YOU ANSWER *ALL* QUESTIONS.

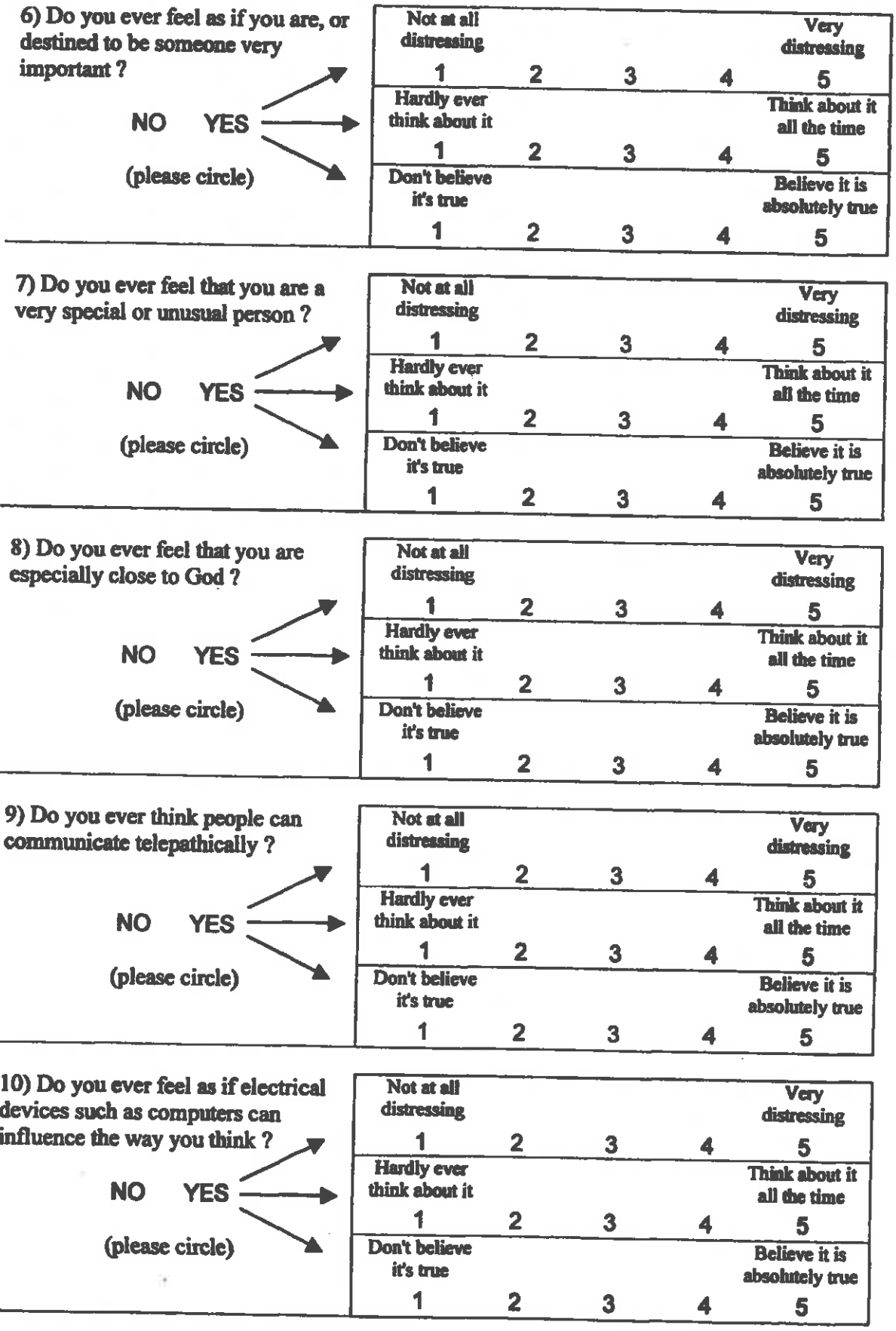
For the questions you answer YES to, we are interested in:
(a) how distressing these beliefs or experiences are
(b) how often you think about them; and
(c) how true you believe them to be.
On the right hand side of the page we would like you to circle the number which corresponds most closely to how distressing this belief is, how often you think about it, and how much you believe that it is true.
If you answer NO please move on to the next question.

Example






1) Do you ever feel as if people seem to drop hints about you or say things with a double meaning ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
2) Do you ever feel as if things in magazines or on TV were written especially for you ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
3) Do you ever feel as if some people are not what they seem to be ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
4) Do you ever feel as if you are being persecuted in some way ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
5) Do you ever feel as if there is a conspiracy against you ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5


6) Do you ever feel as if you are, or destined to be someone very important ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
7) Do you ever feel that you are a very special or unusual person ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
8) Do you ever feel that you are especially close to God ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
9) Do you ever think people can communicate telepathically ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
10) Do you ever feel as if electrical devices such as computers can influence the way you think ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5

11) Do you ever feel as if you have been chosen by God in some way ? NO YES (please circle)	Not at all distressing				Very distressing
	1	2	3	4	5
	Hardly ever think about it				Think about it all the time
	1	2	3	4	5
	Don't believe it's true				Believe it is absolutely true
	1	2	3	4	5

12) Do you believe in the power of witchcraft, voodoo or the occult ? NO YES (please circle)	Not at all distressing				Very distressing
	1	2	3	4	5
	Hardly ever think about it				Think about it all the time
	1	2	3	4	5
	Don't believe it's true				Believe it is absolutely true
	1	2	3	4	5

13) Are you often worried that your partner may be unfaithful ? NO YES (please circle)	Not at all distressing				Very distressing
	1	2	3	4	5
	Hardly ever think about it				Think about it all the time
	1	2	3	4	5
	Don't believe it's true				Believe it is absolutely true
	1	2	3	4	5

14) Do you ever feel that you have sinned more than the average person ? NO YES (please circle)	Not at all distressing				Very distressing
	1	2	3	4	5
	Hardly ever think about it				Think about it all the time
	1	2	3	4	5
	Don't believe it's true				Believe it is absolutely true
	1	2	3	4	5

15) Do you ever feel that people look at you oddly because of your appearance ? NO YES (please circle)	Not at all distressing				Very distressing
	1	2	3	4	5
	Hardly ever think about it				Think about it all the time
	1	2	3	4	5
	Don't believe it's true				Believe it is absolutely true
	1	2	3	4	5

16) Do you ever feel as if you had no thoughts in your head at all ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

17) Do you ever feel as if the world is about to end ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

18) Do your thoughts ever feel alien to you in some way ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

19) Have your thoughts ever been so vivid that you were worried other people would hear them ?

NO YES

(please circle)

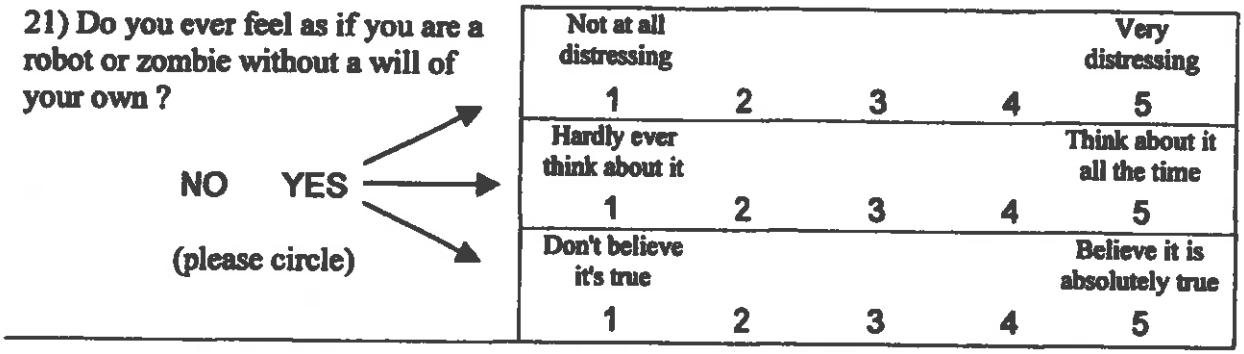
Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

20) Do you ever feel as if your own thoughts were being echoed back to you ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5


21) Do you ever feel as if you are a robot or zombie without a will of your own ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5

Appendix E – Email Communication regarding Ethical Approval for the study.

Appendix F - Participant Information Sheet and Consent Form

Nottinghamshire Healthcare NHS
NHS Trust

Brain, Behaviour & Personality: Community PD sample.

SUMMARY PATIENT INFORMATION SHEET

You are being invited to take part in a study on personality and drinking. Please take time to read the following information carefully with your nursing team, the project organiser or an advocate if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part in this project.

Who is organising the research?

This research is being carried out as a collaboration between the Peaks Academic & Research Unit (PARU), based at Rampton Hospital, and the Division of Psychiatry, University of Nottingham. The project is funded by Nottinghamshire Healthcare NHS Trust and the University of Nottingham.

Why is this project taking place?

We wish to explore the relationship, in those with a diagnosis of personality disorder, between their personality disorder, their drinking history, and their brain function. The study – which you are now being asked to give your consent to – involves:

1. Collecting some background information about you, including information about your personality and about your drinking history. We are seeking your permission to use, <u>for the purpose of this study only</u>, some of the information about you that is already on file or in your case-notes.
2. An interview and completion of some questionnaires.

Who is conducting this project?

The interview will be carried out by Dr Najat Khalifa, or a research assistant under his supervision.

Do I have to take part?

Whether or not you take part is for you to decide. If you choose to take part you will be given this information sheet to keep and you will be asked to sign the attached consent form, which you will also keep. You have the right to change your mind at any time without affecting the care that you receive.

What would be involved?

First you will undergo an interview, lasting about 60 minutes, in which you will be asked questions regarding your experiences with drinking alcohol and other drugs, the sorts of psychological symptoms you have been experiencing, and your experiences while growing up. You will be given a assessment of your intellectual capacity (IQ). Then you will be given some short questionnaires to fill in, asking you about ways in which you typically think, feel and act. Finally, the last interview asks you about any unusual thoughts you might sometimes have – most of us have unusual thoughts sometimes.

What are the pros & cons of taking part?

There are no particular disadvantages to taking part. On the plus side, you may find that the act of answering the questionnaires may give you some insights into the ways you typically think, feel and act. On the minus side, answering questions about your drinking history, particularly during your teenage years, may bring back some unpleasant memories of your adolescence. Since this testing is rather lengthy and will stretch from the morning into the afternoon, we are offering you £10 for sustenance (food and drink), and £5 to cover your travel expenses, a total of £15.

How confidential will the interview be?

Confidentiality is very important for this project. What you say in the interview will not be discussed with anybody else *unless* you disclose certain information:

- About yourself or someone else being harmed
- About an unreported crime
- About a child who is being harmed.

You should bear in mind these limits to confidentiality when taking part in the interview.

There is one other exception to this guarantee of confidentiality:

we wish to share with members of your clinical care team some information, namely your intelligence (IQ) score and your Psychopathy (Psychopathy Checklist) score, that would otherwise be collected by them. This is to prevent unnecessary duplication of procedures that are time consuming and irksome, both for you and the clinical team.

Please note: We will take all possible steps to ensure, as far as we can, complete confidentiality and anonymity of the information you provide us with.

What will happen to the results of this project?

The information you provide, both from the interview and from the questionnaires, will be collated and entered, together with some background information from your case-notes, into a secure computer, ***which only the researchers have access to***. This information will be coded in the computer by number only - your name will never appear together with the information you give. Therefore – with the exceptions noted above -the information we gather from you will remain confidential and anonymous and can never be traced back to you.

How can I find out about what the report says?

A summary of the results of the study will be available from Dr Khalifa. You can ask one of the nursing staff to obtain a copy for you. If you provide an email address or a postal address to the researchers, they will send you a copy of the report.

What if I need any further information?

Please feel free to ask a member of the ward team to contact Dr Najat Khalifa so that any questions or concerns that you may have can be addressed.

What if something goes wrong?

If you are not happy with any aspect of this study and wish to make a complaint, you should speak with the researchers who will do their best to answer your questions. You can call Dr Richard Howard on 0177 7880503 or

Professor Conor Duggan, who is a joint investigator on this research project and is contactable via his Secretary on 0115 9555361. If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints procedure via the local Service Liaison Department on 01777 247396.

CONSENT FORM

Centre Number:

Study Number:

Patient Identification Number for this trial:

Title of Project: Brain, Behaviour & Personality: Psychometric Assessment

Name of Researcher:

Dr Najat Khalifa

Please initial box

1. I confirm that I have read and understand the information sheet dated 05.12.12 (New Version) for the above study and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary. If I decide not to take part, or to withdraw my participation, I may do so at any time, without giving any reason, and without my medical care or legal rights being affected. ☐

3. I understand that sections of any of my medical notes may be looked at by responsible individuals from Nottinghamshire Healthcare NHS Trust or from regulatory authorities where it is relevant to my taking part in research. I give permission for these individuals to have access to my records. ☐

4. I agree to take part in the above study. ☐

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Name of Patient Date Signature

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Name of Person taking consent Date Signature

(if different from researcher)

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Researcher Date Signature

Appendix G – Mr. Carr's CAPP Rating Grid

ATTACHMENT DOMAIN	
Detached	3
Uncommitted	3
Unempathic	5
Uncaring	4
BEHAVIOURAL DOMAIN	
Lacks Perseverance	6
Unreliable	3
Reckless	6
Restless	2
Disruptive	4
Aggressive	4
COGNITIVE DOMAIN	
Suspicious	5
Lacks Concentration	4
Intolerant	2
Inflexible	5
Lacks Planfulness	4
DOMINANCE DOMAIN	
Antagonistic	5
Domineering	3
Deceitful	5
Manipulative	3
Insincere	5
Garrulous	2
EMOTION DOMAIN	
Lacks Anxiety	4
Lacks Pleasure	3
Lacks Emotional Depth	6
Lacks Emotional Stability	5
Lacks Remorse	6
SELF DOMAIN	
Self-centred	4
Self-aggrandising	2
Sense of Uniqueness	4
Sense of Entitlement	5
Sense of Invulnerability	6
Self-justifying	5
Unstable Self-concept	6