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The role of narcissism in aggression and violence: A systematic review

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It has long been hypothesised that feelings of inferiority or low self-esteem lead individuals to aggress against those they view as being superior. However, recent studies suggest that it is not just the level of self-esteem but *stability* that is relevant to understanding this process. As such, researchers have looked to newer constructs, such as narcissism, in trying to understand aggressive behaviours. Narcissism is characterised by a dissociation between an unconscious sense of inadequacy and a conscious feeling of superiority. A large number of studies examining the relationship between narcissism and violence have recently been published within both clinical and student populations. Thus, this review aimed to systematically collate the findings of such studies and integrate them within current theories of violence. Electronic literature databases Web of Science, MEDLINE, PsychINFO, EMBASE, Cochrane databases and Lexis-Nexis (legal database) were searched to identify studies examining the relationship between narcissism and violence. Twenty articles were included in this review describing 25 separate samples. Findings suggest that narcissism is relevant in understanding aggression and violence. This was consistent across both clinical and non-clinical populations and therefore does not appear to be an artefact of studying either very violent or student samples. Evidence from student samples strongly supported the association between narcissism and aggression following an ego threat, whilst studies using clinical samples did not examine the effect of an ego threat. These findings may have an impact on how we understand, predict and reduce violence.

Keywords: Narcissism, violence, aggression, ego threat

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Key Points of the Research

- Both cognitive and psychodynamic models of violence have placed importance on self-esteem. They suggest that implicit low self-esteem, hidden by a veneer of explicit confidence as is the case in narcissism, leaves individuals vulnerable to external events which threatens or undermines this positive veneer (i.e. ego threats) which lead to the activation of negative self beliefs. Violence is used as a means of protecting against these feelings of shame by restoring a sense of pride and self esteem.

- In recent years a number of studies have examined the relationship between narcissism, ego threat and violence in forensic, psychiatric and non-clinical samples. In addition a number of narrative reviews have argued about the importance of narcissism in understanding violence. (Baumeister et al., 2000; Salmivalli, 2001; Walker & Knauer, 2011). Therefore, a review that systematically collates and integrates the findings of these studies into current theories of violence is timely.

- This review found narcissism to be a significant predictor of violence in clinical and forensic samples. Odds ratios ranged from 1.21 to 11.46 suggesting that narcissism is associated with between a 1.2 and 11.5 fold increase in violence. Narcissism was a greater predictor of more severe violence and this may have accounted for the range of odds ratios; the 1.2 fold increase relating to mild or moderate forms of violence and studies examining more severe violence (e.g. homicide) reporting higher odds ratios.

- Similarly narcissism was predictive of aggression in non-clinical student samples. The relationship between narcissism and aggression was most consistently found following an ego threat. This is in line with models of violence.

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According to Howells and Hollin (1989, p4), "aggression refers to the intention to hurt or gain advantage over people without necessarily involving physical injury; [whilst] violence involves the use of strong physical force against another person, sometimes impelled by aggressive motivation". Violence has been a longstanding feature of society. In 1996, the World Health Organisation (WHO) declared violence a major public health issue with the intention of attracting "*greater attention and draw in resources for violence prevention and to stimulate action at local, national, and international levels.*" (Krug, Mercy, Dahlberg, & Zwi, 2002, p32). Since then progress has been made in decreasing violence both globally and in the UK, however it is far from eradicated. In 2012, there were 1.9 million incidences of violence recorded in the UK (Office for National Statistics, 2014) and these are known to have high social and financial costs. For example, figures released by Trust for London (2011) estimated that domestic violence, which accounts for approximately one quarter of violence, cost England £5.5.billion in 2011. This included costs incurred by police, civil justice, housing, refuge and health care services.

Psychological models of violence

The most popular model for understanding violence is Novaco's (1976) cognitive behaviour theory of anger. Novaco suggests that anger is triggered by an environmental event, which results in physiological arousal and a number of information processing biases including attentional and attribution biases. However whether this 'anger response' progresses to violence depends upon the disinhibition of internal control. This disinhibition can come about through a range of factors, including person-specific factors such as high levels of physiological arousal, perception of a low possibility of punishment, and the use of drugs or

alcohol. As such, anger management programmes typically involve increasing self-awareness of anger, triggers and related behaviour coping strategies combined with relaxation training (Fernandez, 2013). Studies have shown that anger management can be effective in reducing anger and aggression (DiGiuseppe & Tafrate, 2003). However studies are often carried out with non-clinical populations (e.g., students) and rely on self-report measures (Walker & Bright, 2009a), whilst research with serious offenders is limited (Beck & Fernandez, 1998; Schamborg & Tully, 2015; Walker & Bright, 2009a). Furthermore, there is a debate about the theoretical validity of anger management programmes. Mills and Kroner (2006) found no relationship between anger and violence or recidivism. Similarly other studies have found that anger does not differ between violent and non-violent groups (Archer, 2004; Loza & Loza-Fanous, 1999). Regardless of the link between anger and violence, focusing on the experience of anger alone neglects to consider the factors that leave some individuals more vulnerable to anger and/or violence provoking stimuli than others.

In contrast, some theories have placed humiliation at the centre of understanding violence. For example, the psychoanalytical theory of violence presented by Gilligan (1996) suggests that violence is a means to an end; it is used to attain justice by punishing those whom they feel have punished them, unjustly. Gilligan argued that a personally meaningful insult results in an overwhelming sense of shame. The violent person is unable to cope with this shame due to a lack of self-esteem or a healthy sense of pride. Therefore, high self-esteem or pride is seen as a defence against humiliation or shame, without which violence becomes a way of restoring a sense of esteem or pride. Similarly, Beck's (1999) work with couples led him to suggest that anger arises when the perpetrator feels diminished or offended, believes that the offence was unjustified and intentional, and views the offensive act/comment as characteristic of that person, therefore concluding that the person is deserving of punishment. The more recent cognitive model of violence proposed by Walker and Bright (2009b) views

violence as an attempt to protect against further injury (humiliation) and the perceived lowering of self-worth and pride. It proposed that, due to early experiences, individuals develop core beliefs about being vulnerable and weak. To defend against and hide these beliefs from others, conditional assumptions develop which manifest as a veneer of confidence and arrogance (i.e., I must never let others see me vulnerable). Social situations that generate embarrassment, or the threat of embarrassment, activate these negative core beliefs making the individual believe that someone has made them look foolish, and that this perpetrator is deserving of punishment.

Self-esteem and violence

In line with these theories, it has been a longstanding view in psychology that feelings of inferiority or low self-esteem predispose people to aggressive or violent behaviour (Horney, 1950). Although empirical evidence does support this perspective, many authors have argued that it is in fact high self-esteem that results in violence. Most notable of these is Baumeister (1996) who argued that violence results from a very positive view of the self that is threatened. A recent systematic review which sought to clarify this issue examined 19 studies, 12 of which found low self-esteem to be related to violence, five found no relationship, one found high self-esteem related to violence and one reported a curvilinear relationship in which both high and low self-esteem were related to violence (Walker & Bright, 2009b). These findings highlight the complexity of understanding the relationship between self-esteem and violence.

Self-esteem is far more multidimensional and dynamic than the term suggests and traditional measures do not reflect this complexity. Self esteem measures rely on the assumption that they reflect the person's true acceptance of him/herself. However self-esteem questionnaires are extremely sensitive to socially desirable responding, various forms of

response biases and related psychological defenses (Johnson, 1997). Thus those scoring high on self-esteem are likely to be a heterogeneous group. A high self-reported self-esteem may reflect a genuine acceptance of oneself, a desire to give others a picture of him/herself as very good, or it may reflect a sense of high self-esteem that defends against underlying self-doubts or an unconscious lower self-esteem. It is the later 'sub-group' that is thought to be of increased risk of increased aggression and violence (Thomaes, Bushman, & Thomaes, 2011).

As such authors have argued that it is not just level of self-esteem but stability that is relevant. Self-esteem stability refers to the magnitude of short-term fluctuations that people experience in their contextually based, immediate feelings of self-worth (Kernis 1993, p 1090). Thus unstable self esteem reflects fragile, vulnerable feelings of immediate self-worth that are influenced by self-relevant events that either are externally provided (e.g., interpersonal rejection) or self-generated (reflecting on one's dating prowess). Kernis (1993) and Kernis et al. (1989) conducted several studies regarding this issue and the findings generally suggest that people with high but unstable self-esteem report the highest tendencies to experience anger and hostility, whereas people with high and stable self-esteem report the lowest. This supports the idea that it is not just the level of self esteem (high versus low) but also stability (stable versus unstable) that relates to aggression. Thus researchers have looked to newer constructs that capture both of these elements such as narcissism. A number of studies have focussed on narcissism (e.g. Bushman and Baumeister 1998; Baumeister, Bushman, & Campbell, 2000) because it captures a self-view that is highly favorable (high self-esteem) and, at the same time, vulnerable to ego threat (unstable).

Narcissism and violence

A central feature of narcissism is a dissociation between an unconscious sense of inadequacy and a conscious feeling of superiority (Kernberg, 1975), more recently thought of

in terms of low implicit self-esteem and high explicit self-esteem (Tafarodi & Ho, 2006).

Self-enhancement and grandiosity are therefore seen as strategies to regulate internal feelings of inadequacy by countering them with feelings of superiority, thereby allowing a person to maintain a sense of pride and self-esteem. Robins and colleagues (2001) suggested that narcissists, more than other individuals, are motivated to seek out situations in which they can feel pride and avoid situations where they might experience humiliations or shame. Bushman and colleagues (2009) examined the relationship between both self-esteem and narcissism on violence. They found no independent effect for high self-esteem alone; but high self-esteem combined with high narcissism was related to aggression in the presence of an insult. Hence it may be that narcissism is central to understanding the relationship between self-esteem and violence and aggression. This literature review focuses on the role of narcissism as a potential mediator between self-esteem, ego threat, and violence and aggression

Aim of Systematic Literature Review

The aim of this study was to examine the following questions: (a) is there a significant relationship between narcissism and aggression/violence? (b) Is the relationship between narcissism and aggression/violence greater in the presence of an ego threat? (c) Is the relationship between narcissism and aggression/violence consistent across clinical and non-clinical samples?

Before continuing it would be helpful to clarify a number of semantic and conceptual issues. The terms *violence* and *aggression* are used somewhat interchangeably in the research and as such will be examined in combination in this review. However, strictly speaking, laboratory procedures measure aggression but not violence insofar as the latter is limited to acts that cause serious harm to victims (Bushman et al., 2009). As such, studies using clinical

samples are typically examining violence (e.g., domestic violence), whereas experimental studies (e.g., application of noise blast) are typically examining aggression.

In addition, narcissism is a complex construct and is thought to comprise a number of sub-components. Component analysis on the Narcissistic Personality Inventory (NPI) generated seven subscales: authority, superiority, exhibitionism, entitlement, vanity, exploitativeness and self-sufficiency (Raskin & Terry, 1988). A number of studies have looked at the effect of one of more subscales (e.g., entitlement) on violence (Konrath, Bushman, & Campbell, 2006). An exploration of these sub-components was beyond the scope of this review and thus the aim of this study was to explore the construct of narcissism as a whole.

Method

Search strategy

Electronic literature databases Web of Science, MEDLINE, PsychINFO, EMBASE Cochrane databases and Lexis-Nexis (legal database) were searched to detect relevant studies. No restrictions were put in place with regard to publication year. The following combinations of key words were entered in the databases' topic/subject search fields to identify eligible publications: $Narcissism\ (MeSH\ term)\ /\ Narciss*/ego*/egotism\ /\ egolistic\ /$ $egotomania\ /\ "high\ self-esteem"\ /\ "inflated\ self-$ $esteem"\ AND\ violence\ (MeSH\ term)\ /\ Aggression\ (MeSH\ term)\ /\ aggress*$ $/\ conflict\ /\ attack\ /\ coerc*\ /\ cruel*\ /\ bully*\ /\ "agonistic\ behavior"$. These search

terms were generated through discussion with an experienced researcher in this field (JW) and were subjected to thesaurus mapping in both Medline and PsychINFO.

Reference sections of included studies and the narrative reviews were screened to detect additional studies. Finally, Google Scholar was consulted to check publications that cited selected studies. The last search was performed on February 2015.

Selection of literature

References were imported into Endnote and duplications were removed. Titles and abstracts were then reviewed to determine selection for full-text reading. Full texts of selected articles were studied to decide upon eligibility for inclusion. The PECO framework used in this review defining the (P)opulation, (E)xposure, (C)omparison and (O)utcome of interest was as follows:

- *P* Adults aged 18 years or over

- *E* Narcissism

- *C* Statistical examination of the relationship

- *O* Aggression and/or violence

Inclusion criteria. Studies were included if they (1) were primary studies examining the relationship between narcissism and aggression or violence in those over the age of 18, (2) reported statistical findings between study variables, (3) were written in English, and (4) were published in peer-reviewed journals. There were no restrictions with regard to publication year, but all of the included studies had been published in the last 25 years.

Exclusion criteria. Papers were excluded if participants were less than 18 years old; the violence was sexually motivated (e.g., rape, sexual aggression) or politically motivated (e.g., war, terrorism). In addition studies were excluded if they reported only on the subscales of measures of narcissism rather than overall score. Single case studies, reviews, books,

commentaries, unpublished dissertations and papers written in languages other than English were excluded.

Inter-rater reliability

Fifteen percent of the titles and abstracts were selected randomly using a random number generator. Two members of the research team individually assessed each of the papers for eligibility for inclusion. An *a priori* procedure was followed to resolve any inter-rater discrepancies; in the case of a disagreement regarding the inclusion of a certain study, both reviewers were asked to re-assess the paper for inclusion. If the reassessment still led to a disagreement between the reviewers an independent third party was also asked to assess the paper in question and the decision would be based on the majority decision. Inter-rater agreement was good with a Cohen's Kappa=0.80, 95% confidence interval of 0.413 to 1.00. All extracted data were checked for accuracy by a member of the research team. Disagreements were discussed and corrected with reference to the original text where appropriate.

Quality of the papers

Quality measures for systematic reviews of observational studies are less well established than in those of randomised controlled trials; a number have been developed but none have been fully validated. The Cochrane Collaborative Review Group recommends the Newcastle-Ottawa Scale (NOS; Wells et al., 2000) for assessing the quality of non-randomised studies in meta-analyses as it is comprehensive and has been partly validated (Higgins & Green, 2009). The methodologies of studies included in this review were varied and included cohort, cross-sectional and experimental designs. Due to the variation in methodology, the NOS scale was adapted. Quality was assessed according to the following

criteria: (1) selection of the study groups (i.e., representativeness of the cases, selection of controls and definition of controls for case–control studies, valid measure of the exposure to primary risk factor); (2) comparability of the groups (i.e., confounding factors adequately controlled for); (3) Outcome (i.e., valid assessment of outcome, adequate description of statistical analysis). If the study fulfilled a criterion one point was given and if not it was awarded zero. A total quality score was then generated by summing the number of criteria met by each study out of a possible ten (See appendix B).

Results

Study selection

The initial search yielded 4029 articles. Based on title and abstract, 173 articles were selected for full-text assessment. Careful reading of these papers highlighted that there was a sufficient number of studies using objective measures of violence or aggression for a systematic review and evidence synthesis. Therefore, all studies that used subjective reports of violence and aggression such as Buss-Perry Aggression Questionnaire (Buss & Perry, 1992) were excluded as previous studies have shown that self-report aggression questionnaires are susceptible to socially desirable responding particularly amongst those presenting as high in self esteem (Baumeister, Campbell, Krueger, & Vohs, 2003; Thomaes, Bushman, & Thomaes, 2011), which is the target sample of this review.

Examination of the reference lists of these articles and those of previous narrative reviews revealed one additional article. A search of Google Scholar to check articles that cited included studies did not produce any additional relevant articles. Hence, 20 articles were included in the review. These articles described 25 separate samples (Appendix A). The included studies were conducted on 25 unique samples. Twenty studies were conducted in different jurisdictions within the United States with the remaining studies performed in

Canada (3), Norway (1), and the United Kingdom (1).

Description of the selected studies

  Design of studies. The designs of included studies were quite varied. Studies were divided into those examining the relationship between narcissism and aggression or violence (Tables 1 and 2) and those examining the relationship between narcissism and aggression in the presence of an ego threat (Tables 3 and 4). Thirteen studies examined the relationship between narcissism and aggression; seven observational studies and six cross-sectional. Of the twelve studies examining the effect of an ego threat, ten used an experimental paradigm where participants were randomised to ego threat condition or no ego threat. Two were observational studies. All studies that used clinical samples used either an observational or cross-sectional design, whereas the majority of studies using student samples used an experimental design.

Nature of the sample. Participants were individuals over the age of 18 years. Eighteen studies used university students and, of these, 11 provided course credit in exchange for participation whilst three recruited from introductory psychology classes (Barry, Chaplin, & Grafeman, 2006; Maples et al., 2010), two recruited from an undergraduate volunteer pool (McIntyre et al., 2007; Reidy, Foster, & Zeichner, 2010) one through advertisments (Lobbestael et al. 2014) and one did not specify (Bushman et al., 2009). Five studies were carried out with a forensic population and two were carried out with a psychiatric population. None of the studies examining the effect of ego threat were carried out with a clinical population.

  Measurement of narcissism. The most commonly used measure of narcissism was the NPI (Raskin & Hall, 1979). The 40-item version of this measure was used by 22 of the included studies. The NPI is based on DSM criteria for Narcissistic Personality Disorder

[NPD] (Raskin & Terry, 1988) and has been validated using clinical samples (Prifitera & Ryan, 1984) and non-clinical samples (Raskin & Terry, 1988). One study used a 21-item version of the NPI, which they adapted for the purpose of this study (Svindseth et al., 2008). However, to the best of our knowledge, there is no data validating this shorter version. Three studies used the Structured Clinical Interview for DSM-III (SCID-II) for Axis II personality disorder diagnoses (Coid, 2002; Maples et al., 2010). One study used the Millon Clinical Multiaxial Inventory-II (MCMI-II; Millon, 1985). The MCMI-II, like the NPI, was designed to assess characteristics consistent with the DSM-III-R criteria. In contrast the NPI measures narcissism as it occurs in a healthy population. Two studies used the Hypersensitivity Narcissism Scale (HSNS; Hendin & Cheek, 1997) which focuses more on symptoms of vulnerability and hypersensitivity, indicative of the concept of narcissism as found in psychoanalytic literature (Kernberg, 1975; Perry & Perry, 1996) as opposed to the NPI and SCID-II, which focus more on boisterous, self-aggrandizing, vain, and interpersonally exploitative behaviour (Hendin & Cheek, 1997; Wink, 1991).

  Aggression and violence. As outlined above, this review used Howells and Hollin's (1989) definition of aggression and violence which states that "aggression refers to the intention to hurt or gain advantage over people without necessarily involving physical injury; violence involves the use of strong physical force against another person, sometimes impelled by aggressive motivation" (p4). Of the 25 studies included, 21 looked at physical aggression; of these, eight studies defined aggression as the intensity and frequency of noise blasts administered to an opponent, seven studies used real world incidences of violence (e.g., violent crime conviction, incidences of violence against staff), four studies defined aggression as the intensity and frequency of electric shock administered to an opponent and two studies defined aggression as the amount of hot sauce allocated to an opponent's food.

  Four studies looked at non-physical aggression; two studies used scores or evaluations

given to a false participant as a measure of aggression and two defined aggression as hindering an opponent's performance during a competitive game.

Provoked aggression (Ego threat). Twelve studies looked at the effect of an ego threat on the relationship between narcissism and violence. Ten studies used a negative evaluation on a piece of work as an ego threat and two studies by the same authors used social rejection by peers.

There was a distinction between whether studies examined direct aggression or displaced aggression. Direct aggression refers to aggression towards the individual who administered the ego threat, whilst displaced aggression refers to aggression directed towards someone who was not responsible for the ego threat. Ten studies looked at direct aggression and two looked at displaced aggression. One study randomised participants to either a direct aggression or a displaced aggression condition (Bushman et al., 2009). For the purpose of the analysis, the results of this study were split between the table section for direct aggression and the table section for displaced aggression (See Tables 3 and 4 respectively).

Evidence from clinical samples

Narcissism and aggression. Six of the seven studies that used a clinical sample found a significant relationship between narcissism and violence (Beasley & Stoltenberg, 1992; Cale & Lilienfeld, 2006; Coid, 2002; Svindseth, Nøttestad, et al., 2008; Warren et al., 2002; Wiehe, 2003). Three of these studies reported odds ratios. Coid (2002) found that those high in narcissism were over two and a half times more likely (OR=2.84) to be violent towards inmates and prison staff than those low in narcissism. Svindseth et al. (2008) found that those high in narcissism were only 20% more likely to be mildly/moderately violent (OR=1.21) but 11.5 times more likely to be severely violent (OR= 11.46). Warren et al. (2002) found that those with NPD were nearly five times more likely to have been convicted for a violent crime

excluding homicide (OR = 4.92), but were seven and a half times more likely to have been convicted of a violent crime including homicide (OR = 7.57). Thus, the findings of both Svindseth et al. (2008) and Warren et al. (2002) suggest that there is a stronger relationship between narcissism and more severe forms of violence.

Only one study did not find a significant relationship (Goldberg et al., 2007). They found no difference in narcissism between the aggressive group and non-aggressive group of psychiatric inpatients. However, the aggressive group had only twenty participants, which is the smallest sample size of any of the clinical studies and may therefore have been underpowered. Beasley and Stoltenberg (1992) found a significant difference between perpetrators of domestic violence and controls on the MCMI-II measure of narcissism but not on the NPI. There is no obvious explanation for this inconsistency across measures. Both the NPI and the MCMI-II are based on the DSM-III criteria. However, the NPI was designed to measure narcissism in the general population, whereas the MCMI-II measures pathological narcissism indicative of NPD. Thus, perhaps pathological narcissism is more strongly related to violence.

Narcissism and aggression following an ego threat. No studies carried out with clinical populations examined the relationship between narcissism and violence following an ego threat.

Mediating variables No clinical studies controlled for the effect of self-esteem, gender or previous violence.

Antisocial personality disorder/psychopathy. Coid (2002) was the only study that controlled for antisocial personality disorder and psychopathy. After controlling for the confounding effects of these, narcissism was a significant predictor of violence towards other inmates and staff.

Gender. Although no studies controlled for gender it was possible to compare the

results of studies that had an all-male sample to those with an all-female sample. Three studies were carried out with a male-only sample and each of these found a significant relationship between narcissism and violence (Beasley & Stoltenberg, 1992; Cale & Lilienfeld, 2006; Coid, 2002). Similarly, the only study that looked at a female-only sample of inmates at a high secure unit also found a significant relationship between narcissism and violence (Warren et al., 2002). Furthermore the effect size (OR = 4.92-7.57) reported by Warren et al (2002) was comparable to studies with male-only samples (OR= 1.21-11.46). This would suggest that in clinical samples the relationship between narcissism and violence is consistent across genders.

Evidence from student samples

Narcissism and aggression. Six studies examined the relationship between narcissism and violence within a student population. Of these, four found a significant effect of narcissism (Lobbestael et al. 2014; Maples et al., 2010; Reidy et al., 2010; Terrell, Hill, & Nagoshi, 2008), one study did not find an effect (Maples et al., 2010) and one did not find a significant relationship when analysis was carried out with a mixed gender sample (73% female) but when carried out only with males the relationship was significant (McIntyre et al., 2007).

Narcissism and direct aggression following an ego threat. Ten studies looked at the effect of an ego threat on the relationship between narcissism and direct aggression. In contrast to the above findings with clinical populations only two studies with student populations found a significant main effect of narcissism (Barry et al., 2006; Bushman & Baumeister, 1998), four found no effect (Jones & Paulhus, 2010; Kirkpatrick, Waugh, Valencia, & Webster, 2002; Vaillancourt, 2013) and four did not report on the main effect of narcissism (Bushman & Baumeister, 1998; Bushman et al., 2009; Twenge & Campbell, 2003;

Vaillancourt, 2013).

In contrast, seven studies found an interaction between narcissism and ego threat in that narcissism was related to increased aggression following negative feedback or insult (Barry et al., 2006; Bushman & Baumeister, 1998; Bushman et al., 2009; Jones & Paulhus, 2010; Twenge & Campbell, 2003; Vaillancourt, 2013). Furthermore effect sizes were comparable across studies; four studies reported Pearson's r ranging from .25-.37. Three studies reported Beta, however variations in their analysis made it difficult to directly compare these results.

Three studies found no interaction between narcissism and ego threat; two of which were reported in Kirkpatrick et al. (2002) and one in Vaillancourt (2013). Although Kirkpatrick's studies had relatively high quality ratings, both used the same methodology and defined aggression as the quantity of hot sauce allocated to an opponent's food. Similarly, Vaillancourt's study, which had a relatively low quality rating, used student evaluations of teaching as a measure of aggression. In contrast, studies that did find an effect predominantly used administration of noise blasts as a measure of aggression. As suggested previously, this may indicate a difference in effect based on the type or severity of the aggression.

Six studies found that in the presence of positive feedback, narcissism was unrelated to violence (Barry et al., 2006; Bushman & Baumeister, 1998; Bushman et al., 2009; Jones & Paulhus, 2010; Vaillancourt, 2013) and one study found that there was a significant relationship between narcissism and violence following positive feedback (Bushman et al., 2009). Bushman had a relatively high quality rating and the largest sample size of studies looking at positive feedback, which may account for the effect reaching significance.

Narcissism and displaced aggression following an ego threat. Three studies looked at displaced aggression and narcissism in the presence of an ego threat. Two found a main effect of narcissism (Martinez, Zeichner, Reidy, & Miller, 2008; Twenge & Campbell, 2003)

and one did not report on the main effect of narcissism (Bushman et al., 2009). Two studies found that narcissism significantly predicted displaced aggression following an ego threat (Martinez et al., 2008; Twenge & Campbell, 2003); one study found no such relationship (Bushman et al., 2009). The reason for this inconsistency is difficult to determine. Each of these studies used the same measure of aggression (noise blast) and a similar experimental design. In terms of methodology, Bushman had a larger sample size and the highest quality rating of the three studies, perhaps making his finding more reliable.

Mediating variables

Gender: Four studies with mixed samples reported on the effect of gender. Neither of Twenge et al., (2003) studies found a significant interaction between narcissism and gender. Their samples were 48% and 49% female respectively and they used the administration of noise blast as a measure of violence. In contrast, McIntyre and colleagues (2007) found no significant relationship between narcissism and aggression when analysis was carried out with a mixed gender sample (73% female) but found a significant relationship when only the male sample was analysed. Similarly, Terrell and colleagues found that when the sample was split by gender there was a significant correlation between narcissism and aggression amongst males but not females. Again there was a difference in the measurement of aggression across these four studies. Both studies by Twenge and colleagues (2003) used the administration of noise blasts as a measure of aggression, whilst both Terrell et al. (2008) and McIntyre at al. (2007) used attacks during competitive computer games as a measure of aggression. This may suggest a gender difference in type of aggression or conditions under which it will be expressed.

Self-Esteem: Ten studies adequately controlled for self-esteem. Of these, eight found that self-esteem did not account for the relationship between narcissism and violence alone or in the presence of an ego threat (Bushman & Baumeister, 1998; Bushman et al., 2009; Jones

& Paulhus, 2010; Martinez et al., 2008; McIntyre et al., 2007; Twenge & Campbell, 2003). In contrast, Kirkpatrick and colleagues' (2002) first study did not find a main effect for narcissism but after controlling for self-esteem found narcissism negatively predicted aggression. However, in their second study, using the same methodology, they found a significant positive relationship between narcissism and aggression before controlling for self-esteem and no relationship when self-esteem was added to the equation. As there were no differences in methodology between the original and replication study, and considering the overall pattern of findings across the literature, it would suggest that the original result was an anomalous finding. It may also indicate that the allocation of hot sauce, used by Kirkpatrick, is not a reliable measure of aggression.

Antisocial PD/Psychopathy: Jones and Paulhus (2010) was the only study to control for measured psychopathy. They allowed it to compete with narcissism in a regression analysis and no main effect for narcissism or psychopathy was found. However the interaction between narcissism and ego threat was significantly related to aggression, whilst the interaction between psychopathy and ego threat was not significant.

Discussion

The findings from this review, summarised in table 5, suggest that narcissism is relevant in understanding aggression and violence. The review had four main findings. First, the review found that narcissism was consistently (six studies out of seven) related to violence in clinical samples. . Odds ratios ranged from 1.21 to 11.46 suggesting that narcissism is associated with between a 1.2 and 11 fold increase in violence. Narcissism was a greater predictor of more severe violence and this may have accounted for the range of odds ratios; the 1.2 fold increase relating to mild or moderate forms of violence and studies examining more severe

violence (e.g. homicide) reporting higher odds ratios. Second, the review found a relationship between narcissism and increased aggression amongst student samples.. Thus, this result does not appear to be an artefact of studying very violent samples or student samples.

Third, the review found that the relationship between narcissism and aggression in student samples was strongest following an ego threat.. Of the ten studies that looked at narcissism and aggression following an ego threat, only two of the six studies that reported a main effect for narcissism found a significant effect, where as seven out of ten found a significant interaction between narcissism and ego threat. Hence in non-clinical samples narcissism is most strongly associated with aggression following negative feedback (i.e. an ego threat). This is in line with cognitive and psychodynamic models of violence (discussed below).

Forth, we found that whilst narcissism was related to aggression following negative feedback, studies consistently (six out of seven) reported no link between narcissism and aggression following positive feedback. It is unclear whether this is because positive feedback negates the effect of narcissism on aggression or an ego threat is necessary to produce a relationship. This finding may have clinical implications for reducing violence and aggression in those high in narcissism. These are discussed below.

Finally, there was some limited evidence to suggest that narcissism also led to increased displaced aggression following an ego threat. Thus those high in narcissism may aggress not only toward those who delivered the ego threat, but towards innocent bystander. This finding is less robust as only three studies explored displaced aggression and the findings were mixed.

None of these results of this review were accounted for by self-esteem, supporting the view that narcissism offers something additional to understanding the impact of an ego threat on violence and aggression.

Limitations of the literature

No clinical studies to date have adequately controlled for previous violence whilst only one study controlled for psychopathy, both of which are known predictors of violence. Similarly studies with students did not adequately control for confounding variables such as previous violence or gender.

Another limitation of this research relates to the measurement of narcissism, most commonly the NPI. The majority of studies used self-report measures of narcissism. The NPI, like all self-report measures, is open to impression management meaning that individuals may tailor their responses by giving socially desirable answers. In addition, there is some evidence from this review that different measures of narcissism give different results. This may be because of the different emphasis some measures place on aspects of narcissism. The Hypersensitivity Narcissism Scale (HSNS; Hendin & Cheek, 1997) focuses more on symptoms of vulnerability and hypersensitivity, whilst the NPI and SCID-II focus more on boisterous, self-aggrandizing, vain, and interpersonally exploitative behaviour (Hendin & Cheek, 1997; Wink, 1991). This is indicative of the complex and multifaceted nature of narcissism and highlights the need for future research to address some of the difficulties in defining and measuring narcissism.

Variations in the measurement of aggression/violence across studies may account for some of the variability across findings. Of the studies that did not find an effect of narcissism and violence following an ego threat, two used allocation of hot sauce as a measure of aggression and one used student evaluations of teaching. In contrast, the majority of studies that did find an effect defined aggression as duration and intensity of a noise blast or an electric shock administered to opponent. Research validating different measures of violence/aggression would be of value. Based on the findings of this review the use of a noise

blast or electric shock seemed to give the most consistent results whilst results of studies using the application on hot sauce was less reliable.

Strengths and limitations of this review

The strengths of this systematic review are that it was comprehensive, structured and protocol driven with an explicit methodology. Twenty papers reporting on 25 studies were included from a wide geographical area. The review team included clinical researchers meaning that practical recommendations were considered in this context.

In order to avoid the biases associated self-report measures of aggression (Thomaes, Bushman, & Thomaes, 2011; Baumeister, Campbell, Krueger, & Vohs, 2003), we included only objective measures of aggression. This may limit the generalisability of these finding as measures used, particularly with student samples, had a limited set of operalisations of aggression e.g. shock, intensity of noise blasts. Aggressive behaviour was also between relative strangers with limited opportunities to retaliate against the aggressor, and few opportunities for responses other than aggressive behaviour. Nevertheless findings from these studies were consistent with those using clinical samples measuring 'real world' incidences of aggression and violence (e.g. domestic violence, incidences of violence against inmates). This is in line with other studies that have shown that experimental studies of aggressive behaviour have external validity (Anderson, Lindsay & Bushman 1999).

This study excluded grey literature, which increases the risk of publication bias as published studies tend to have larger effect sizes. Cochrane review protocols recommend that grey literature is included but this recommendation related to reviews of randomised controlled trials, which are of a superior methodology than correlational and cross-sectional studies included here. Therefore, on balance, it was decided to prioritise quality of methodology and exclude grey literature (which is not always peer reviewed) but the

limitations of this decision are acknowledged.

Implications for clinicians and policy makers

The results of this review indicate that narcissism is a helpful construct in understanding violence. This is in line with suggestions that it is not high self-esteem alone that leads to violence but rather high self-esteem that defends against underlying self-doubts or an unconscious lower self-esteem that leads to increased risk of violence. As such narcissism could be a useful alternative to self-esteem in understanding violence and aggression. The findings also support both psychoanalytical (Gilligan, 1996) and cognitive (Walker & Bright, 2009b) models of violence, which suggest that those with a lack of stable or healthy self esteem are vulnerable to humiliation and therefore aggress to restore a sense of self-worth and pride. The relationship between narcissism and aggression following an ego threat, provide support for these models in that those with high levels of narcissism were more likely to act aggressively following an ego threat than those who were low in narcissism. These findings may also suggest a need to extend traditional cognitive models of violence (e.g. Novaco's) and resulting anger management programs to include the factors that leave some individuals more vulnerable to anger evoking stimuli.

Factors that mediate the effect are of significant interest. The difference in aggression following positive or negative feedback suggest that rehabilitation programmes that seek to build more realistic and stable self-esteem may be helpful in reducing violence. There has not been much research looking at how this would be effectively done. Thomaes and colleagues (2009) found that an intervention where adolescent students had to write a self-affirmative paragraph reduced incidences of aggression and violence for one week follow up compared to a control group. Although promising, more research in needed in this area particularly looking at adult and offender populations. Altering self views will more challenging with these groups

as they are likely to be well developed and deeply ingrained in patterns of maladaptive behaviour compared to adolescents.

Whilst interventions promoting stable self-views may have the potential of reducing violence, programmes or approaches that are perceived as an ego threat may result in an increase in violence amongst those high in narcissism. Prison staff and clinicians working with violent individuals who are high in narcissism should be aware of this potential relationship. The nature of narcissism is likely to leave the other feeling that the individual needs to be 'brought down a peg or two' - though based on the findings this is likely to increase aggression and violence. This may be a helpful factor to consider in risk assessment protocols. However, many of these implications are speculative and have been extrapolated from studies with undergraduates; experimental studies with clinical samples are required to confirm these conclusions.

Implications for future research

Future studies would benefit from addressing a number of methodological issues. This could be achieved by adequately controlling for confounding variables, such as previous violence, the presence of psychopathy or antisocial personality disorder, and gender. All of which are known predictors of violence.

All the studies looking at the relationship between narcissism and violence following an ego threat were carried out with a student population. As stated previously, there are problems with generalising findings based on student samples (Peterson, 2001) and, although there is strong evidence of a relationship between narcissism and violence in forensic populations, the extent to which situational factors (e.g., ego threat) are important in precipitating aggressive or violent behaviour in the presence of high narcissism is unknown as such violent acts may or may not have been the result of an ego threat. Conducting research in

prisons presents a number of challenges, including negotiating the regulatory, research and ethical frameworks required by the prison service, as well as the logistical difficulties of accessing prisons and prisoners. However, although challenging in both design and execution, it would be a valuable avenue for future research.

Implications for Practice, Policy and Future Research

- Narcissism may be a useful factor to consider when assessing risk of aggression and violence. In clinical samples it is associated with between a three and eleven fold increase in violence with risk increasing with severity of violence. Findings from student samples would also suggest that risk of violence in those high in narcissism increases following an ego threat.

- These findings support the cognitive model of violence (Walker and Bright 2009b) and suggest that rehabilitation programmes that seek to build more realistic and stable self-esteem may be helpful in reducing violence, where as treatment programmes that are perceived as an ego threat or lower the individuals feelings of self worth may lead to increased risk of violence in those high in narcissism.

- This study highlights a number of areas requiring future research. Experimental studies with clinical samples are required to confirm the relationship between narcissism, ego threat and violence demonstrated in student samples. Future studies would be greatly improved by adequately controlling for confounding variable such as previous violence, gender, psychopathy and antisocial PD.

- The field would also benefit from more studies systematically testing out assumptions put forward by models of violence, there-by allowing us to build up a more complete picture of the mechanisms underpinning violence. This will hopefully one day

culminate in more effective psychological interventions aimed at reducing violence and aggression.

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Table 1: Narcissism and aggression in clinical samples

Authors	Sample	Design	Measure	Findings
Beasley and Stoltenberg, 1992 United States	Target group: Perpetrators of DV (n=49) Control Group: non-violent but distressed relationships (NDV; N=35) 100% male Mean age: 34 Ethnicity: 86% Caucasian	Cross-sectional comparison of perpetrators of domestic violence and non-violent control group	N=NPI; MCMI A/V= Physical violence defined as assaults on the partner's body confirmed by arrest history or evidence by victim	1. Significant difference between DV group and NDV on MMCI narcissism subscale $F(1,71)=10.57$, $p<.001$; DV (M=72.2, SD=23.22); NDV (M=56.73, SD=19.72) 2. No significant difference between groups on the NPI; DV (M=17.02, SD=7.78), NDV (M=16.08, SD=6.94) **MANCOVA**
Cale and Lilienfeld 2006 United States	Prison inmates n=98 100% male Mean age (SD): 23.7 (7.7) Ethnicity: 64% African American; 28% European; 7% other	Observational study looking at predictors of incidences of violence	N: NPI A/V: behaviour ratings from prison record and informant ratings from prison officers and counsellors	1. Narcissism was significantly related to aggression ($R^2=.14$, $p<.05$) **Multiple regression**
Coid, 2002 United Kingdom	Prison inmates n= 81 100% male Mean age (SD): 34 (7.58) Ethnicity: nr	Observational study looking at predictors of incidences of violence	N: SCID-II A/V: Physical violence towards inmates and prison staff rated through review of prisoners' unit file and discussion with prison staff	1. Narcissism predicted violence against inmates (adjusted odds ratio= 2.84; (CI 1.08-7.47); p=0.034.) 2. Narcissism predicted violence against staff (adjusted odds ratio=2.84; CL(1.08-7.42); p=0.031 **Logistic regression**
Goldberg et al., 2007 United States	Psychiatric inpatients n= 76 Aggressive group n=20 Non-aggressive group n=56 26% female Mean age (SD): 38.6 (11.38) Ethnicity: nr	Cross sectional observational study, participants were split based on ROAS score of ≥ 5	N: NPI A/V: Both physical and non-physical aggression against others using ROAS (Sorgi et al., 1991) based on chart notes	1. No significant difference in Narcissism between aggressive group (16.85) and non aggressive group (M=14.36) **MANCOVA**

Svindseth et al. 2008 Norway	Psychiatric Inpatient n=186 High narcissism group n=98 Low narcissism group n=88 41% female Mean age (SD): 37.3 (13.4) Ethnicity: nr	Cross-sectional study. Participants divided into high and low narcissism group	N: NPI 21 A/V: Physical Violence observed on the wards and documentation in the medical records	1. There was a significant correlation between aggression and NPI (r=0.32; p<0.01) **Semipartial correlation** 2. In the presence of High Narcissism (low narcissism=ref) No Violence (ref) (OR=1); Mild/Moderate V (OR=1.21; 95% Cl=0.51-2.87; p=0.67); Severe V (OR= 11.46; 95%; Cl=2.02-65.60; p=0.006) **Multivariate Logistic regression**
Warren et al. 2002 United States	Inmates in maximum security prison Target group: n=132 with Cluster B PD Control group n= 128 without Cluster B PD. 100% female Median age= 32 Ethnicity: 66% minority, 34% non-minority?	Cross sectional study retrospectively looking at predictors of incarceration for violent crime	N: SCID-II A/V: Physical Aggression defined as incarceration for a violent offense	1. NPD significantly predicted current incarceration for any violent crime, including homicide (B = 1.0 +/- 0.33, $p < .01$, OR = 7.57) 2. NPD significantly predicted current incarceration for any violent crime, excluding homicide (B = 0.80 +/- 0.26, $p < .01$, OR = 4.92) **Logistic regression**
Wiehe, 2003 United States	Target group: Abusive parents (n= 52) Control group: foster parents (n= 101) 76% females Age: nr Ethnicity: 49% White, 45% African-American, 3% Hispanic, 3% Other	Cross sectional study comparing abusive and non-abusive parents	N=HSNS A/V: Physical and non physical aggression defined by investigation for child physical or emotional abuse by child protective service agencies	1. Abusive Parents (AP) exceeded the Foster Parents (FP) on measure of narcissism; AP (M=30.21 SD=7.49) FP (M=22.71 SD=5.24); t=6.45, p<0.05 **ANOVA** 2. Narcissism was a significant predictor of aggression (R^2=.28; F=18.80; β= -.46) **Regression**

NPI= Narcissism Personality Inventory; N= narcissism; A/V= aggression/violence; ROAS= Retrospective Overt Aggression Scale; MMCI= Millon Clinical Multiaxial Inventory; SCID-II= Structured Clinical Interview for DSM-III for axis II personality disorder; HSNS= Hypersensitivity Narcissism Scale

Table 2: Narcissism and aggression in student samples

Authors	Sample	Design	Measure	Findings
Lobbestael et al. 2014 United States	UG students n=100 100 % male Mean age (SD): 19.47 (2.16). Ethnicity: 73% Caucasian, 12% Hispanic, 7% Asian, 6% African American, 2% Arab.	Observational study where participants took part in competitive task and then filled in narcissism measures	N=HSNS; NPI A/V: Physical aggression defined as the frequency of noise blasts administered to fake participant during a competitive computer task	1. Narcissism as measured by the NPI was related to aggression (B=.244; t=2.49; p=.014) 2. Narcissism as measured by the HSNS was not significantly related to aggression (B=.098; t=.967 ; p=.336). **(Multiple regression)**
Maples et al. 2010 Study 1 United States	UG students n=108 45% female Mean age (SD): 19.16 (1.30) Ethnicity: 80% Caucasian	Observational study where participants filled in narcissism measures and then took part in competitive task	N: SCID-II A/V: Physical aggression defined as intensity, duration, and frequency of shocks delivered	1. There was a significant correlation between DSM-IV NPD and aggression; r= .22 p<.05 **(bivariate correlation)**
Maples et al. 2010 Study 2 United States	UG students n=134 43% Female Mean age (SD): 19.31 (1.67) Ethnicity: 81.3% Caucasian	Observational study where participants filled in narcissism measures and then took part in competitive task	N: SCID-II A/V: Physical aggression defined as intensity, duration, and frequency of shocks delivered.	1. Aggression was not significantly correlated with DSM-IV NPD (r= .15 p>.05) **(bivariate correlation)**
McIntyre et al. 2007 United States	UG students n= 176 43 % Female Mean age: 22 Ethnicity: 60% White, 20% Asian or Asian–American, 11% Black, 3% Hispanic,	Observational study where participants filled in narcissism measures and then took part in simulated war game	N: NPI A/V: Non physical aggression defined by whether or not the player made an unprovoked attack	1. High narcissism was not significantly related to aggression: Narcissism: Low (B= 0; exp (B) =1; p=Referent) Medium (B (SE)=0.21(0.66); exp(B)= 1.24; p=0.745); High (B(se)= 0.74 (0.67); exp(B)=2.09; p=0.271); Very High

	1% Native American, and 5% Other		during simulated war game	(B(SE)=0.86(0.64); exp(B)=2.37; p=0.174)
				2. In males only, narcissism predicted greater odds of attacking: Narcissism Low (B= 0; exp (B) =1; p=Referent); Medium (B (SE)=1.66 (1.03); exp(B)= 5.23; p=0.107); High (B(se)= 2.77 (1.07); exp(B)=15.92; p=0.010); Very High (B(SE)=2.46 (1.15); exp(B)=11.70; p=0.032) **Logistic Regression**
Reidy et al. 2010 United States	UG students n= 137 after exclusions – original n=159 and following demographics relate to this full sample. 100% males Mean age (SD): 19.2 (1.4) Ethnicity: 82.5% Caucasian, 7.3% Asian, 4.4% Black/African- American, 1.5% Hispanic/Latino, 0.7% American- Indian, and 3.6% Other	Observational study where participants filled in narcissism measures and then took part in competitive task	N=NPI A/V: Physical aggression defined as intensity, duration, and frequency of shocks delivered	1) A significant relationship between narcissism and aggression (B=.39, SE=.21, Exp(B)= 1.48) indicated that for every one SD increase in narcissism, the odds of being an unprovoked aggressor increased by 48% **Logistic regression**
Terrell et al. 2008 United States	UG students n=150; 52% female Mean age (SD): 19.27 (2.47). Ethnicity: 73% Caucasian, 11% Latino/Hispanic, 7% Asian, 3% African–	Observational study where participants filled in narcissism measures and then took part in competitive task with fake participant	N: NPI A/V: Physical aggression defined as the frequency of noise blasts administered to fake participant during a competitive computer task	1. A significant main effect for narcissism ($F_{(2, 126)}$=4.37, p=.015, n^2_p = .065), where participants higher in narcissism were more likely to deliver noise blasts than individuals low in narcissism **ANOVAS** 2. For males there was a significant correlation between narcissism and aggression (r=.261 p<.05)

| | | | | | 3. For females relationship between aggression and narcissism was not significant. (r=.086 p<.05) **Correlation** |

NPI= Narcissism Personality Inventory; N= narcissism; A/V= aggression/violence; HSNS= Hypersensitivity Narcissism Scale; SCID-II= Structured Clinical Interview for DSM-III for axis II personality disorder;

Table 3: Narcissism and direct aggression in the presence of an ego threat

Authors	Sample	Design	Measure	Findings
Barry et al., 2006 United States	UG psychology students N=120 50% females Age: nr Ethnicity: 79% Caucasian	Experimental study randomised to receive positive or negative feedback (ego threat) from false participant.	N: NPI A/V: Non-physical aggression defined as how much they hinder fake participant in Fishing simulation task (Gifford & Gifford, 2000)	1) Significant main effect for narcissism (Beta = .27, p < .01) with higher narcissism related to increased aggression after feedback. 2) Significant interaction between feedback and narcissism (Beta = -.21 p < .05), with negative feedback predicting an increase in aggression among participants high on narcissism. 3) Significant three-way narcissism by feedback by sex interaction for predicting changes in aggression, ($F_{(7, 112)}$ = 5.33, p < .001, R^2 change = .04). After positive feedback, high narcissism was associated with slight increases in aggression for males but not for females. Following negative feedback, males with high narcissism showed high increases in aggression, whereas females with narcissism demonstrated only slight increases in aggression **Multiple Regression**

Bushman et al., 1998 Study 1 United States	UG psychology students N=260 50% female Age: nr Ethnicity: nr	Experimental study randomised to receive positive or negative feedback (ego threat) from false participant.	N=NPI A/V: Physical aggression defined as the intensity and duration of a noise blast administered to fake participant during competitive reaction time task	1) Significant main effect of narcissism on aggression, $F_{(1, 245)} = 13.92$, $p < .05$, $b = 0.06$, $SE = 0.02$, $r = .27$. 2) A significant interaction between narcissism and ego threat, $F_{(1, 245)} = 5.04$, $p < .05$, $b = 0.08$, $SE = 0.03$ indicating that high narcissism and an ego threat resulted in high aggression. 3) The relationship between narcissism and aggression was stronger when the evaluation was negative, ($F_{(1,245)} = 20.36$, $p < .05$, $b = 0.11$, $SE = 0.02$, $r = .37$) than when it was positive ($F_{(1, 245)} = 4.59$, $p < .05$, $b = 0.05$, $SE = 0.02$, $r = .18$) but both were significant. **Multiple Regression**
Bushman et al., 1998; Study 2 United States	UG psychology students N=140* 50% female Age: nr Ethnicity: nr	Experimental study randomised to receive positive or negative feedback (ego threat)	N=NPI A/V: Physical aggression defined as the intensity and duration of a noise blast administered during competitive reaction time task	1) Narcissism was positively related to aggression when the evaluation was negative ($F_{(1, 254)} = 9.62$, $p < .05$, $b = 0.09$, $SE = 0.04$, $r = .25$), but it was unrelated to aggression when the evaluation was positive ($F_{(1, 254)} = 0.34$, $p > .05$, $b = -0.02$, $SE = 0.02$, $r = -.10$, respectively) **Multiple Regression**
Bushman et al., 2009 Study 2 United States	UG psychology students N=132; 50% females Age: nr Ethnicity: nr	Observational study: All received negative feedback (ego threat)	N=NPI A/V: Physical aggression defined as the intensity and duration of a noise blast administered during competitive reaction time task	1) The main effect of narcissism was not significant ($b=0.040$, $t(128)=1.86$, $p<.07$) 2) In the presence of negative feedback there was a significant relationship between narcissism and aggression was ($r=.25$) **Multiple Regression**
Jones et al., 2010	n= 82 60% Females Mean age: 20.4	Experimental study randomised to receive positive	N=NPI A/V: Physical aggression: the intensity	1) The main effect of narcissism was not significant (Beta = .16, $t=1.32$, $p=.19$)

Canada	Ethnicity: nr	or negative feedback (ego threat).	and duration of a noise blast administered to fake participant during competitive reaction time task	2) There was a significant interaction between narcissism and feedback whereby negative feedback evoked greater aggression among those high in narcissism (Beta= 2.23, t = 2.32, p = .02) **Multiple Regression**
Kirkpatrick et al., 2002 Study 1 United States	n=88 55% women Age: nr Ethnicity: nr	Experimental study randomised to receive positive or negative feedback (ego threat)	N=NPI A/V: Physical aggression defined by the amount of hot sauce put on the false participants food	1) Main effect of narcissism was not significant (Beta= -.09, p > .10) 2) The interaction between narcissism and feedback was not significant (Beta= .13 p>.05). 3) When self esteem was controlled for, narcissism was a negative predictor of aggression (Beta=-.24, *p* < .05) **Multiple Regression**
Kirkpatrick et al., 2002 Study 2 United States	n=75 53% women Age: nr Ethnicity: nr	Experimental study randomised to receive positive or negative feedback (ego threat)	N=NPI A/V: Physical aggression defined by the amount of hot sauce put on the false participants food	1) Main effect for narcissism was a significant, positive predictor of aggression (Beta = .27, p < .05) 2) The interaction between narcissism and feedback was not significant (Beta = .15, p < .10). 3) When self esteem was controlled for narcissism was not significant predictor of aggression in this equation (Beta= .23, *p* > .10) **Multiple regression**
Twenge and Campbell 2003 Study 3 United States	n=31 48% women Mean age: 18.9 Ethnicity: 74% White and 26% racial minority	Observational study: All received a social rejection (ego threat) by fake participant.	N=NPI A/V: Physical aggression defined as the intensity and duration of a noise blast administered during competitive task	1) When rejected narcissism was significantly related to aggression (b=0.12; Beta=.51; t=2.97 p<.01) **Multiple Regression**
Vaillancourt 2013 Study 1 Canada	UG students n= 176 55% female; Mean age (SD): 18.78 (1.80)	Experimental study randomised to receive positive or negative feedback (ego	N=NPI A/V: Non-physical aggression score given to false university staff member on the	1) In the negative feedback group there was a significant correlation between narcissism and aggression (r= -.26; p<.01)

	Ethnicity: 44.3% Caucasian, 21% Asian, 15.3%, South Asian	threat) from false member of university staff.	students' evaluations of teaching form	2) In the positive feedback group there was not a significant relationship between narcissism and aggression (r=.09; p>.05) **Correlation**
Vaillancourt, 2013 Study 2 Canada	UG students n=160 50% female Mean age (SD): 19.16 (3.18) Ethnicity: 50% Caucasian, 20.3% South Asian, 15.2% Asian	Experimental study randomised to receive positive or negative feedback (ego threat) from false member of university staff.	N=NPI A/V: Non-physical aggression score given to false university staff member on the students' evaluations of teaching form	1) The narcissism was not significantly related to aggression following negative feedback (r= -.07, p>0.05) or positive feedback (r=.00, p>0.05) **Correlation**

NPI= Narcissism Personality Inventory; N= narcissism; A/V= aggression/violence

Table 4: Narcissism and displaced aggression following an ego threat

Authors	Sample	Design	Measure	Findings
Bushman et al., 1998; Study 2 United States	UG students n=140* 50% female Age: nr Ethnicity: nr	Experimental study randomised to receive positive or negative feedback (ego threat) from false participant.	N=NPI A/V: Physical aggression defined as the intensity and duration of a noise blast administered, during competitive task	1) Narcissism was not related to displaced aggression when feedback was positive ($F_{(1, 254)}$ =0.99, p>.05, b=0.02, SE=0.02, r=.14) or negative ($F_{(1, 254)}$ = 0.61, p > .05, b = 0.02, SE = 0.03, r = .10) **Multiple regression**
Martinez et al., 2007 United States	n=92 Gender: 100% male Mean age (SD): 19.5 (2.01) Ethnicity: 87% Caucasian	Experimental study randomised to receive negative feedback, positive feedback or delayed feedback from the researcher	N=NPI A/V: Physical aggression defined as the mean intensity and duration of electric shocks during competitive task	1) Significant main effect of narcissism on aggression (Beta=.26, b = .45, p < .01) even when self esteem was controlled for. 2) The effect of narcissism was stronger in the delayed feedback condition than in the negative feedback condition (b = -.82, p ≤ .05) the positive condition (b = -1.40, p ≤.01) **Stepwise regression**
Twenge and Campbell 2003 Study 4 United States	n=61 Gender: 49% female Mean age: 18.4 Ethnicity: 82% White, 18% racial minority	Experimental paradigm: Participants were randomised to experience rejection or acceptance by fake participants	N=NPI A/V: Physical aggression defined as the intensity and duration of a noise blast administered, during competitive task	1) Significant main effect of narcissism (b=0.06; Beta=.21; t=1.65, p<.05) 2) Significant interaction between narcissism and feedback (b=0.46; Beta=.28; t=2.43; p<.01) The relationship between narcissism and aggression was stronger for those who received an ego threat (r(37) = .42, p < .01) than those who did not (r(20) = –.17, p>.05) 3) Narcissism remained significant even after self esteem was controlled for. **Multiple regression**

Note: * = total N for study was 280 but N=140 for the displaced aggression condition and N=140 in the direct aggression condition (displayed in table 3). NPI= Narcissism Personality Inventory; N= narcissism, A/V= aggression/violence
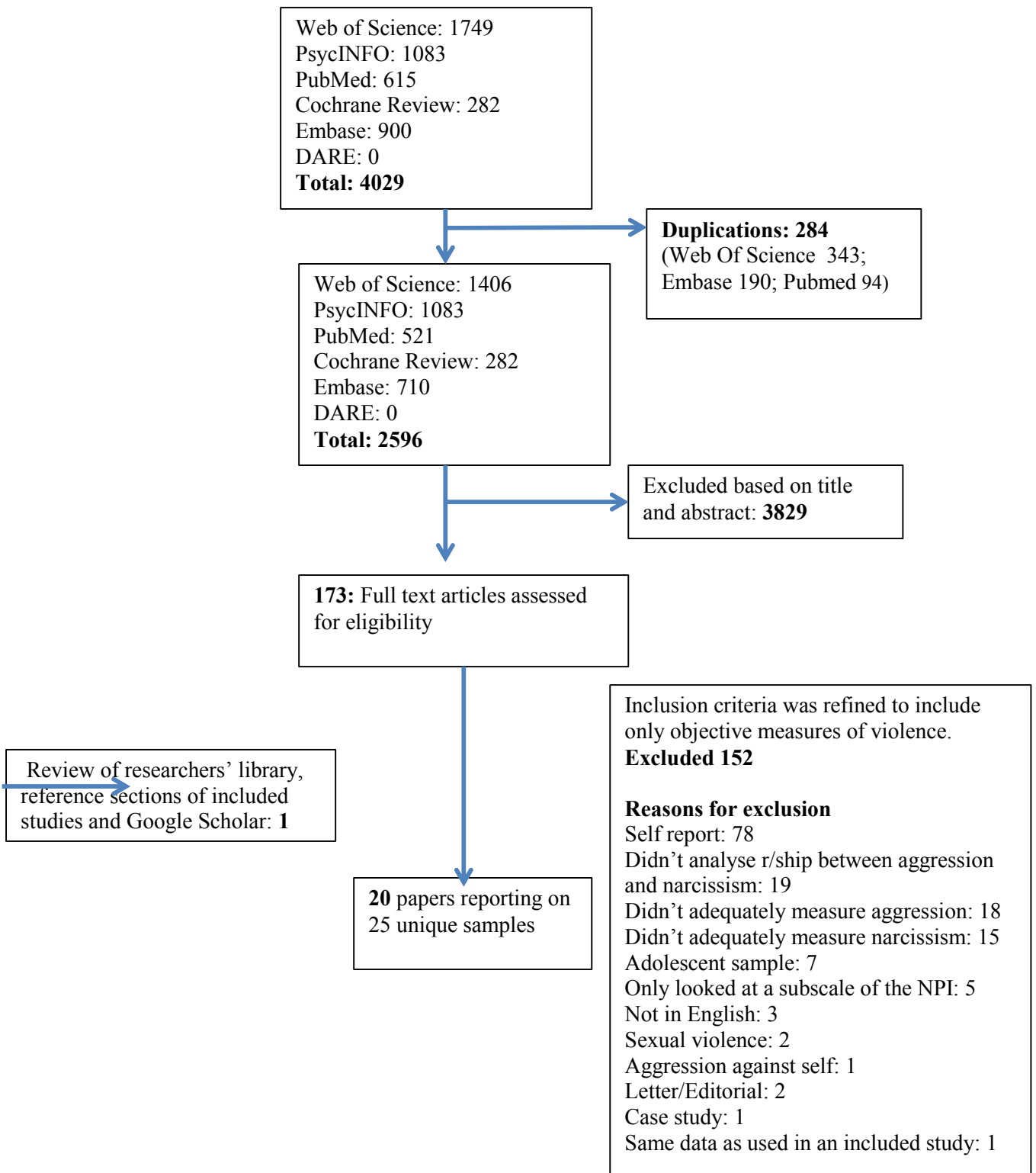
Table 5 Summary of findings across all studies with clinical and student samples, in order of their quality rating

Is narcissism related to aggression/violence			
Study	**Association found: narcissism**		**Association found: narcissism and ego threat**	**Quality rating**

Study	Association found: narcissism — Y	Association found: narcissism — N	Association found: narcissism and ego threat	Quality rating
Clinical Samples	**Y**	**N**		
Warren et al., 2002	Yes		-	6
Wiehe, 2003	Yes		-	6
Beasley and Stoltenberg 1992	Yes		-	5
Coid, 2002	Yes		-	5
Goldberg et al. 2007		No	-	5
Cale and Lilienfeld 2006	Yes		-	4
Svindseth et al. 2008	Yes		-	4
Student Samples				
McIntyre et al. 2007	Yes*		-	5
Terrell, Hill & Nagoshi, 2008	Yes		-	4
Lobbestael et al. 2014	Yes		-	4
Reidy et al. 2010	Yes		-	2
Maples et al. 2010 Study 1	Yes		-	2
Maples et al. 2010 Study2		No	-	2

Is narcissism related to aggression/violence following an ego threat					
Study Name	**Association found: narcissism**		**Association found: narcissism and ego threat**		**Quality rating**
Student Samples	**Y**	**N**	**Y**	**N**	
Direct Aggression					
Jones et al. 2010		No	Yes		7
Bushman et al. 1998 Study 1	Yes		Yes		6
Bushman et al. 2009 Study 1 Bushman et al. 1998 Study 2	-		Yes		6
Kirkpatrick et al. 2002 Study 1		No		No	6
Kirkpatrick et al. 2002 Study 2	Yes			No	6
Barry et al. 2006	Yes		Yes		5
Bushman et al 2009 Study 2		No	Yes		5
Vaillancourt, 2013 Study 1	-		Yes		5
Vaillancourt, 2013 Study 2		No		No	5
Twenge et al. 2003 Study 3	-		Yes		4
Displaced Aggression					
Bushman et al. 2009 Study 1 Bushman et al. 1998; Study 2	-			No	6
Twenge et al. 2003 Study 4	Yes		Yes		5
Martinez et al. 2007	Yes		Yes		4

Question not examined and/or reported on; Shading = two papers reporting on same sample;
In McIntyre et al. 2007 relationship between narcissism and violence was only significant for the male sample not in the mixed gender sample

Appendix A: Study selection flowchart

Web of Science: 1749
PsycINFO: 1083
PubMed: 615
Cochrane Review: 282
Embase: 900
DARE: 0
Total: 4029

Duplications: 284
(Web Of Science 343;
Embase 190; Pubmed 94)

Web of Science: 1406
PsycINFO: 1083
PubMed: 521
Cochrane Review: 282
Embase: 710
DARE: 0
Total: 2596

Excluded based on title
and abstract: **3829**

173: Full text articles assessed
for eligibility

Review of researchers' library,
reference sections of included
studies and Google Scholar: **1**

20 papers reporting on
25 unique samples

Inclusion criteria was refined to include
only objective measures of violence.
Excluded 152

Reasons for exclusion
Self report: 78
Didn't analyse r/ship between aggression
and narcissism: 19
Didn't adequately measure aggression: 18
Didn't adequately measure narcissism: 15
Adolescent sample: 7
Only looked at a subscale of the NPI: 5
Not in English: 3
Sexual violence: 2
Aggression against self: 1
Letter/Editorial: 2
Case study: 1
Same data as used in an included study: 1

Appendix B : Table of quality rating for each study listed in alphabetical order

Study	Selection					Comparability					Outcome		Quality Rating
	Size	Type	Sample selection	Control group	Valid measure of risk factor	Age	Gender	Self Esteem	Previous violence	AntisocialPD /Psychopathy	Assessment of Outcome	Statistics described	
Barry et al 2006	120	UG	0; SOC	1	1; NPI	0	1	0	nr	nr	1	1	5
Beasley and Stoltenberg 1992	84	F	1; REP	1	1; NPI 1; MCMI	0	0	0	nr	0	1	1	5
Bushman et al. 1998 Study 1	260	UG	0; SOC	1	1; NPI	nr	1	1	nr	nr	1	1	6
Bushman et al. 1998 Study 2	280	UG	0; SOC	1	1; NPI	nr	1	1	nr	nr	1	1	6
Bushman et al 2009 Study 2	132	UG	0; SOC	0	1; NPI	nr	1	1	nr	nr	1	1	5
Cale & Linienfeld, 2006	96	F	1; REP	0	1; NPI	0	0	0	0	0	1	1	4
Coid, 2002	81	F	1; REP	0	1; SCID-II	0	0	0	0	1	1	1	5
Goldberg et al. 2007	76	P	1; REP	1	1; NPI	0	0	0	nr	nr	1	1	5
Jones and Paulhus, 2010	82	UG	0; SOC	1	1; NPI	0	1	1	nr	1	1	1	7
Kirkpatrick et al. 2002 Study 1	88	UG	0; SOC	1	1; NPI	1	0	1	nr	nr	1	1	6
Kirkpatrick et al. 2002 Study 2	88	UG	0; SOC	1	1; NPI	1	0	1	nr	nr	1	1	6
Lobbestael et al. 2014	100	UG	0; SOC	0	1;NPI 1;HSNS	0	1	0	0	0	1	1	4

Study	N												
Maples et al. 2010 Study 1	108	UG	0; SOC	0	1; SCID-II	0	0	0	nr	nr	1	0	2
Maples et al. 2010 Study 2	134	UG	0; SOC	0	1; SCID-II	0	0	0	nr	nr	1	0	2
Martinez et al. 2007	94	UG	0; SOC	1	1; NPI	0	0	1	nr	nr	1	0	4
McIntyre et al. 2007	176	UG	0; SOC	0	1; NPI	0	1	1	nr	nr	1	1	5
Reidy et al. 2010	137	UG	0; SOC	0	1; NPI	0	0	0	nr	0	1	0	2
Svindseth et al. 2008	186	P	1; REP	1	0; NPI-21	0	0	0	nr	nr	1	1	4
Terrell et al. 2008	150	UG	0; SOC	0	1; NPI	0	1	0	0	nr	1	1	4
Twenge and Campbell 2003 Study 3	31	UG	0; SOC	0	1; NPI	0	1	1	0	nr	1	0	4
Twenge and Campbell 2003 Study 4	61	UG	0; SOC	1	1; NPI	0	1	1	0	nr	1	0	5
Vaillancourt, 2013 Study 1	176	UG	0; SOC	1	1; NPI	0	1	1	0	nr	1	0	5
Vaillancourt, 2013 Study 2	160	UG	0; SOC	1	1; NPI	0	1	1	0	nr	1	0	5
Warren et al. 2002	161	F	1;REP	1	1; NPI	1	0	0	nr	0	1	1	6
Wiehe, 2003	153	F	1;REP	1	1; HSNS	1	0	0	nr	nr	1	1	6

Note. 1=criteria fulfilled; 0=criteria not fulfilled; nr= variable not measured/reported. REP = Representative sample; SOC = Sample of Convenience; NPI= Narcissism Personality Inventory; MMCI= Millon Clinical Multiaxial Inventory; SCID-II= Structured Clinical Interview for DSM-III for axis II personality disorder; DSM-IV NPD; HSNS= Hypersensitivity Narcissism Scale