

Observer Ratings of Interpersonal Behaviour as Predictors of Aggression and Self-Harm in a High-Security Sample of Male Forensic Inpatients

Zarah Vernham¹

Department of Psychology, University of Surrey, Guildford, Surrey. U.K.

James Tapp

Estelle Moore

Centralised Groupwork Service, Broadmoor Hospital, Crowthorne, Berkshire. U.K.

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¹ Correspondence concerning this article should be addressed to: Zarah Vernham, University of Portsmouth, Psychology Department, King Henry Building, King Henry 1 Street, Portsmouth, PO1 2DY, UK, or via e-mail: zarah.vernham@port.ac.uk.

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Abstract

Incidents of aggression and self-harm in forensic mental health inpatient settings present a significant challenge to practitioners in terms of safely managing and reducing the harm they cause. Research has been conducted to explore the possible predictors of these incidents and has identified a range of environmental, situational and individual risk factors. However, despite the often interpersonal nature of the majority of aggressive incidents, few studies have investigated forensic inpatient interpersonal styles as predictors of aggression and even fewer have explored the potential interpersonal function of self-harming behaviours. The current study investigated the predictive validity of the Chart of Interpersonal Reactions in Closed Living Environments (CIRCLE) for incidents of verbal and physical aggression, and self-harm recorded from 204 high-secure forensic inpatients. Means comparisons, correlations and Receiver Operating Characteristics (ROC) were conducted on recorded incident data at 12-, 24- and 48-months following baseline assessment using the CIRCLE. Dominant and coercive interpersonal styles were significant predictors of aggression, and a coercive interpersonal style was a significant predictor of self-harm, over the recorded time periods. When categorising the inpatients on the basis of short- and long-term admissions, these findings were only replicated for inpatients with shorter lengths of stay. The findings support previous research which has demonstrated the benefits of assessing interpersonal style for the purposes of risk planning and management of forensic inpatients. The predictive value may be time-limited in terms of stage of admission.

Keywords: Interpersonal style; Aggression; Self-harm; Forensic inpatients; Observational assessment.

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Forensic mental health inpatients are detained in secure hospital settings on the basis that they pose a significant risk to the public and/or themselves. Whilst detention can remove certain threats of harm through physical security, high-risk behaviours, such as aggression and self-harm, are still acted out behind secure walls. Although interventions are in place to manage such risks, these institutional incidents remain a pervasive problem within forensic mental health institutions (Bowers et al., 2011; Daffern, Howells, & Ogloff, 2006). There are differing theoretical perspectives on the aetiology of aggression in general, which include a range of biological (Lorenz 1966; Gray 1971); psychological (Miller & Dollard, 1941); and socio-cultural (Bandura & Walters 1963) factors, and a proposed interplay between them (Berman, 1997). These have been identified in research investigating risk factors for incidents of aggression, and to a lesser extent self-harm, in forensic inpatient settings. Clinical characteristics of forensic inpatients and emotional concomitants of mental disorder symptoms have been associated with an increased risk of both institutional violence and self-harming behaviour (e.g., Cheung, Schweitzer, Tuckwell & Crowley, 1996; Jeglic, Vanderhoff & Donovan, 2005; Krakowski & Czobor, 1997; McNiel & Binder, 1994). Aspects of the hospital environment, such as loss of liberty and freedom restrictions, overcrowding, lack of personal space, and an absence of structured activities are identified as closely connected social factors that can impact upon incidents of aggression (Geen, 1990; Lanza, Kayne, Hick & Milner, 1994). Similarly, environmental restrictions, boredom, and not being occupied, are suggested antecedents of self-harming incidents recorded within secure settings (McKerracher, Loughnane & Watson, 1968). From a goal-directed position, a range of motivations for the function of self-harming behaviours has been proposed. These include affect-regulation (self-harm as a means of regulating difficult emotions, e.g., hopelessness and anger, particularly in a setting where it may be difficult or there may be consequences to expressing strong negative emotions), a form of self-punishment (self-harm as an expression of anger towards the self), and interpersonal-influence

(self-harm as a social function related to the manipulation of others within their environment, e.g., “cry for help” or to avoid abandonment) (Daffern & Howells, 2009; Klonsky, 2007; Podvoll, 1969). Whilst a number of studies have investigated and supported the affect-regulation and self-punishment functions of self-harm (Klonsky, 2007; 2009), practice-based experience and attitudes of forensic mental health staff also consider interpersonal-influence as an important motivation (Gough & Hawkins, 2000).

Interpersonal Theory

A theoretical perspective that has more recently been investigated among forensic inpatients is the interpersonal style of those that engage in high-risk behaviours. Interpersonal theory, proposed by Sullivan (1953) and further developed by Leary (1957), defines a range of interpersonal styles as blends of two orthogonal dimensions of power (dominance vs. submission) and affiliation (hostility vs. nurturance) that form a circumplex (circular structure), termed the interpersonal circle (IPC) (see Figure 1). Differences in interpersonal style are proposed to be underpinned by beliefs about the self and others that are organised around the fundamental social motives of power and affiliation. Therefore, the IPC provides a profile in which the differing degrees of intensity of each interpersonal style, between and within individuals, across various social interactions can be identified.

INSERT FIGURE 1 HERE

A central assumption of interpersonal theory is that normal and abnormal functioning lie on a continuum (Pincus, 1994). Adaptive responses to different situations require a range of interpersonal skills represented by the IPC that can be applied when presented with challenging interactions (e.g., hostility). However, genetic factors and developmental experiences can cause a specific interpersonal style to develop and the more this is relied upon, the narrower a range of interactions are experienced, and therefore the less a person relies on behaviour from the opposite side of the IPC. In some instances, interpersonal styles can be more dysfunctional than others (Blackburn, 1998), and when interpersonal functioning is maladaptive this can reflect an inflexible,

problematic and persistent interpersonal style (Blackburn & Renwick, 1996). This is a core component of personality disorders, a common diagnosis of patients in secure forensic settings (Birtchnell & Shine, 2000).

A further assumption of interpersonal theory is that interactions are governed by social rules in which interpersonal behaviour functions to elicit a reaction from the other person in the encounter, the principle of complementarity (Leary, 1957). For example, along the dominance-submission axis, complementarity is reciprocal, so a dominant action would result in a submissive reaction (Carson, 1970). The eight interpersonal behaviours of the IPC can be combined to elicit different responses, for example, a hostile-dominant action, which is viewed as threatening, will elicit a hostile-submissive reaction, causing the respondent to be viewed as withdrawn (Blackburn & Glasgow, 2006). Interpersonal styles are persistent across the lifespan and across situations because early social interactions create expectations of how others are likely to react to specific actions, resulting in self-fulfilling prophecies (Carson, 1970).

Both the principle of complementarity and the inflexible and problematic interpersonal styles have been argued to be important to understanding how forensic inpatients may react to others and the hospital regime when detained (Daffern, Day & Cookson, 2012). Recent research on these concepts has identified that patients involved in institutional incidents present with interpersonal styles that can be differentiated from patients who do not engage in such behaviours. Dominant, hostile and coercive interpersonal presentations of patients, with fewer adaptive interpersonal styles (e.g., warmth), have been shown to be significant predictors of incidents of aggression across a range of secure inpatient settings (e.g., Cookson, Daffern & Foley, 2012; Daffern, Duggan, Huband & Thomas, 2008; Dolan & Blackburn, 2006; Logan & Blackburn, 2003). Conversely, a compliant interpersonal style has been identified as characteristic of patients who are able to avoid conflict with others (Doyle & Dolan, 2006). A coercive interpersonal style has also been identified as characteristic of patients who have recorded incidents of self-harm. A hypothesis from this finding was that this behaviour could be a means of negotiating interpersonal influences

or boundaries (Daffern et al., 2010), which would correspond with the theory of interpersonal-influence as a motivation to self-harm (Klonsky, 2007).

These studies offer a useful foundation for research into the relevance of assessing interpersonal styles of forensic inpatients from a risk management perspective, in particular the predictive validity of interpersonal assessments. However, it may also inform intervention strategies to promote more helpful and adaptive interpersonal skills. The present study aimed to replicate current research findings, investigating associations between dominance (the disposition of an individual to assert control in dealing with others), hostility (being unfriendly and antagonistic) and coercion (the action or practice of persuading someone to do something by using force or threats), and verbal aggression, physical aggression and self-harm. The objective was to further establish the predictive validity of an interpersonal style assessment for these types of incidents. The present study also aimed to respond to the sample size and longitudinal limitations of previous research and include inpatients with mental illness diagnoses as the existing focus has been on forensic inpatients or prisoners with personality disorder. Finally, as it has been proposed that both the process and early stages of admission may be perceived as coercive themselves and therefore lead to ‘acting out’, or conflicting with a coercive interpersonal style, in response to being detained (e.g., Daffern, Howells & Ogloff, 2006; Norton & Dolan, 1995), the present study also explored differences in the predictive validity of interpersonal styles for short and long stay inpatients.

Hypotheses

Based on existing research, it was hypothesised that observer rated dominance, hostility and coercion would predict verbal and physical aggression (Hypothesis 1); and that coercion would predict incidents of self-harm (Hypothesis 2). It was also hypothesised that the assessed interpersonal styles would have increased predictive validity for inpatients with shorter lengths of hospital stay (Hypothesis 3). This is based on the assumption that in the earlier stages of admission, inpatients may be at odds with their detention and adjusting to a new environment, and staff will still be developing their relational security with the inpatients.

Method

Sample

The sample consisted of adult (>18 years) male forensic mental health inpatients detained under the Mental Health Act (MHA; HMSO, 1983) at a UK high-security hospital.

Design

A retrospective quasi-experimental and correlational study design was applied to investigate the differences in interpersonal styles between forensic inpatients with and without reported incidents of aggression and self-harm; and the predictive validity of interpersonal styles for these incidents.

Assessment

The Chart of Interpersonal Reactions in Closed Living Environments (CIRCLE; Blackburn & Glasgow, 2006). The CIRCLE is a 51-item nurse observation scale developed to assess interpersonal behaviours in closed environments, such as secure hospital settings. Items describe verbal and nonverbal social behaviours that correspond to the octants of the IPC. Each item is rated on a four-point likert scale and scored 0 to 3 (0 = not at all, 1 = occasionally, 2 = fairly often, 3 = usually or frequently). Ratings are obtained from two independent observers, who are familiar with the individual being assessed, and have observed their behaviour over at least one month, to restrict biased ratings. Items that form the dominance scale include: “voices strong opinions” and “tries to organise or influence others”; items that form the hostility scale include: “shirks obligations or responsibilities” and “expression is hostile and unfriendly”; and items that form the coercion scale include: “easily annoyed or irritated” and “insulting and abusive to other patients”. A high score represents the extent to which each interpersonal style (e.g., dominance, hostility, and coercion) is observed (Blackburn & Renwick, 1996). The CIRCLE has been shown to have ‘satisfactory’ psychometric properties and the inter-correlations meet the geometric requirements of a circumplex structure (Blackburn & Glasgow, 2006; Blackburn & Renwick, 1996).

Institutional Incident Reporting System. Institutional incidents of aggression and self-harm are recorded using an Incident Report (IR1), which can be completed on an online reporting system at the study site. Incidents are recorded immediately after they occur, and once the IR1 form is completed, the incident is validated, approved and countersigned. Incident categories are explicitly defined within a Hospital Policy Framework (Department of Health, 2009) to promote reliability. Categories include: Verbal aggression – “the use of inappropriate words or behaviour causing distress and/or constituting harassment towards a person”, e.g., stalking and threats; Physical aggression – “the intentional application of force against a person without lawful justification, resulting in physical injury or personal discomfort”, e.g., punching and weapon use; and Self-harm – “not an attempt to commit suicide but where self-injury has been caused to the body”, e.g., burning and cutting.

Procedure

Ethical approval for the study was sought and granted by an NHS Research Ethics Committee. A priori power analysis was conducted using G*Power Version 3 to determine the estimated sample size (Faul, Erdfelder, Lang, & Buchner, 2007). A conventional power level of 0.95 and a probability level of 0.05 were applied (Cohen, 1992). The most conservative effect size determined from Dolan and Blackburn’s (2006) findings was used to ensure sufficient sample size for all comparisons. As the study used retrospective data, an estimated sample size of 120 would be sufficient to reach the required power levels and effect sizes.

The sample was identified from the Centralised Groupwork Service (CGS) based at a UK high-security hospital. All inpatients referred to the CGS are required to complete an initial suitability assessment, which includes two CIRCLE assessments from members of the inpatients nursing team. The assessment is typically completed at the early stages of a patient’s admission to the hospital. A case file review was conducted to collate item level scores for CIRCLE assessments, which were inputted into the Statistical Package for the Social Sciences (SPSS). Where only one CIRCLE rating was collected the individual was removed from the sample as two ratings are

required to enhance accuracy and account for rater biases. A total score for each octant on the CIRCLE was obtained by summing the items corresponding to each octant scale and reliability analyses were conducted to establish internal consistency and inter-rater reliability. Missing data was managed using the mean substitution method. This method replaces all missing data in each of the items with the mean value of that item. It was deemed the most appropriate method of imputation because of the small number of unsystematic missing values in the data set. To promote the reliability of the study findings, statistical analyses were conducted on data with and without missing values and any differences in the significant findings between the two data sets have been reported.

Incidents of verbal and physical aggression and self-harm for the study sample were identified via electronic IR1 forms between 2004 and 2009 inclusive. Details collated included the date and location of the incident, and the incident category and description. Incidents of verbal aggression, physical aggression and self-harm were further categorised into those that occurred 0-12 months, 0-24 months and 0-48 months following the CIRCLE baseline assessment and a total number of incidents for each individual in the sample was calculated. Inter-rater reliability statistics were calculated on a randomly selected proportion of incidents.

Analysis

Descriptive statistics were conducted on collated demographic (age, ethnicity), clinical (ICD-10 diagnosis; World Health Organisation, 1992) and forensic (index offence) characteristics of the study sample.

Means comparisons between inpatients with and without reported incidents of verbal aggression, physical aggression and self-harm were conducted for dominant, hostile and coercive scales of the CIRCLE, as directed by the hypotheses. Similarly, correlations were conducted between the CIRCLE total scores on the dominant, hostile and coercive scales and the total frequency of incidents.

Receiver Operating Characteristic (ROC; Mossman, 1994) curves examined the association between CIRCLE scores on the dominant, hostile and coercive scales and the presence or absence of reported verbal aggression and physical aggression, and the coercive scale only for incidents of self-harm. A ROC curve was generated plotting the rate of true positives against the rate of false positives for each of the CIRCLE scales and represented the trade off in specificity that occurred as sensitivity increased. The Area Under the Curve (AUC) of the ROC graph was the index for interpreting the overall predictive validity of each of the CIRCLE scales. AUC values range from 0 (perfect negative prediction) to 1 (perfect positive prediction), with 0.5 corresponding to no-better-than chance prediction. Values below 0.61 were deemed marginal; values between 0.61 and 0.75 were moderate; and values exceeding 0.75 were high (Dolan & Blackburn, 2006). ROC analyses were also used to investigate the differences in predictive validity of the CIRCLE scales between inpatients with shorter and longer admission lengths.

All statistical analyses were conducted on incident data collected at 12-, 24- and 48-months to investigate whether the predictive validity of the CIRCLE scales changed over time. Data was screened to determine the distribution of CIRCLE ratings and incidents. Where data was not normally distributed non-parametric statistics tests were conducted and are indicated. Outliers were identified but retained as the study was investigating data trends over a specific time period and should therefore be less influenced by extreme cases.

Results

Sample Description

From a total sample of 262 male forensic mental health inpatients with CIRCLE ratings, 58 were excluded because they only had one rating completed, leaving 204 male inpatients in the final sample (mean age = 41.53 years; *SD* = 10.03). The majority of inpatients were White British (60.8%), and most had an index offence of violence (including homicide) (62.7%) or sexual violence (13.2%). The most prevalent ICD-10 (World Health Organisation, 1992) primary

diagnoses were paranoid schizophrenia or delusional disorder (48.0%) and personality disorder (antisocial and borderline) (28.5%).

Reliability Analyses

Cronbach's alpha coefficients for each of the CIRCLE scales ranged from .70 – .92 ($M = .79$), indicating 'good' internal consistency (George & Mallery, 2003). Intra-class correlations ranged from .50 – .67 ($M = .57$), which are comparable to those achieved in previous research, and illustrate satisfactory agreement between raters (see Table 1). The reported Kappa (Cohen, 1960) on the randomly selected proportion of incidents ($n = 60$) was .925 ($p < .001$).

INSERT TABLE 1 HERE

Means Comparisons and Correlations for Incident Data

Patients with reported incidents of verbal and physical aggression at 12-months post CIRCLE assessment had significantly higher ratings of interpersonal dominance and coercion, but not hostility, when compared with CIRCLE ratings of inpatients with no recorded incidents. Inpatients with reported incidents of self-harm also had significantly higher mean ratings of interpersonal coercion (see Table 2). These reported differences were maintained at 24- and 48-months.

INSERT TABLE 2 HERE

Spearman's Rho correlations of the 12-month incident data illustrated that there were significant positive associations between the dominance and coercion scores and the frequency of verbal aggression and physical aggression, but not for the hostility scores. A significant positive association was also found between the coercion scores and the frequency of self-harm (see Table 3). All associations were consistent at 24-months, whereas at 48-months a further significant positive association was found between the hostility scores and the frequency of verbal aggression ($\rho = .115, p = .050$) and physical aggression ($\rho = .128, p = .034$).

INSERT TABLE 3 HERE

Predictive Validity of the CIRCLE Scales

AUC values for the 12-month incident data ranged from .544 to .778 across all variables (see Table 4). The dominant and coercive scales were significantly predictive of verbal and physical aggression, and self-harm for the latter scale. The hostile ratings were not statistically predictive of verbal or physical aggression. These findings were consistent at 24- and 48-month time periods.

INSERT TABLE 4 HERE

Length of Admission and the Predictive Validity of the CIRCLE

ROC curves were generated to make comparisons on the CIRCLE scale scores of dominance, hostility and coercion between inpatients with shorter (below the mean of 53.26 months; N=124) and longer (above the mean of 53.26 months; N=80) admission lengths (see Table 5).

AUC values ranged from .502 to .824 across all interpersonal scales for the shorter admission lengths, and from .570 to .667 for the longer admission lengths. Both the dominant and coercive scales had significant AUC statistics for the investigated incident types for the shorter admission group. The hostile scale did not have significant AUC statistics for verbal or physical aggression. None of the AUC statistics were significant for the longer admission lengths. As with the previous analyses, these findings were consistent at 24- and 48-months.

INSERT TABLE 5 HERE

Discussion

The aim of the present study was to both replicate and develop existing research investigating the association between interpersonal style and incidents of verbal and physical aggression, and self-harm, in a high-secure forensic hospital setting.

Consistent with previous studies, forensic mental health inpatients who were rated as having dominant and coercive interpersonal styles were significantly more likely to have recorded incidents of verbal and/or physical aggression. As postulated by Dolan and Blackburn (2006), the present study demonstrated that these associations were retained with longer periods of follow-up, although were not increased over time, as hypothesised. Interestingly, the predictive validity of these

interpersonal styles was only applicable to inpatients with shorter lengths of hospital stay. One explanation for this finding is that inpatients with limited interpersonal strategies may perceive the early process of admission as coercive and act out in response or as a means of coping (Daffern, Howells & Ogloff, 2006; Norton & Dolan, 1995). In support of this, institutional acting out behaviour has been reported to be highest within the first year of hospitalisation and diminish over time (Hill, Rogers & Bickford, 1996). In addition, patients may be anxious about being admitted to a high-secure hospital setting, also worrying about the stigma of being diagnosed with a mental disorder. They may be uncertain about adhering to a new routine, being required to engage in treatment and having to establish themselves among a new peer group. This has certainly been voiced by patients in terms of how to “get [their] heads round being in high-security, how it is different from prison, how people treat you, what the expectations of the place are” (Moore, Lumbard, Cathy, Ayres, 19 hospital residents & one former patient, 2012). Anxieties from this experience may amplify negative interpersonal interactions, which may in turn lead to conflict and further antisocial solutions. A less consistent finding is the association between a hostile interpersonal style and incidents of verbal and physical aggression. In the present study, hostility did not significantly predict either verbal or physical aggression. This is in contrast to Dolan and Blackburn (2006) and Logan and Blackburn (2003), but corresponds to a study by Daffern et al. (2010) that also failed to show any relationship between hostility and aggression. The latter authors suggested that a combination of hostility and dominance are predictive of aggression, but independently, hostility has limited association. A further correlational analysis for the present study indicated that there was no significant correlation between the rated hostility and dominance for the study sample ($rho = .126, p = .109$), which lends some support to this explanation.

Observer rated interpersonal behaviours of coercion were a significant predictor of self-harming incidents. Significantly higher scores on this interpersonal style were rated for inpatients with recorded self-harming incidents, compared to inpatients without. Correlations similarly illustrated a significant positive relationship between the coercive interpersonal style ratings and the

frequency of self-harm. The ROC curves obtained AUC values greater than 0.5, demonstrating that coercion predicted incidents of self-harm better than chance. The AUC value obtained for the coercion subscale in predicting incidents of self-harm in patients with shorter admission lengths was the largest obtained in the current study and would be categorised as 'high' if compared to the findings reported by Dolan and Blackburn (2006). A similar association between coercion and incidents of self-harm was reported by Daffern et al. (2010), who considered the interpersonal-influence function of self-harm behaviour as an explanation for this finding (Klonsky, 2007). Inpatients may intentionally inflict harm on themselves as a means of securing or enhancing interpersonal connections with others by activating increased care contact; particularly if their options for adaptive interpersonal interactions are compromised (Nock, 2008; Turner, Chapman & Layden, 2012).

As discussed, the findings obtained in this study were generally consistent across the incident data collected at 12-, 24- and 48-months following CIRCLE baseline assessment. The only exception was the hostility ratings, which had a significant positive association with recorded incidents of verbal aggression and physical aggression at 48-months. In somewhat contrast to the possibility of perceived coercion during early stages of admission, inpatients who can be hostile may experience frustrations from being detained long-term. Whilst this was not formally tested in the current study, it has been discussed in other studies on institutional aggression (Flanagan, 1981, 1995).

Study Strengths and Limitations

The present study consisted of a large sample with good statistical power. Inpatients were diverse in age, ethnicity, index offences and primary diagnoses; thus representing the full range of inpatient groups in high-security. However, it should be noted that the sample only included male forensic mental health inpatients and therefore the findings are not representative of female forensic mental health inpatients.

The sample also consisted of inpatients referred to a therapy service within the hospital setting, and therefore may represent a sampling bias if more challenging inpatients are less likely to be referred to the services, due to risk. However, inpatients referred are not necessarily symptom-free when attending the service, and some attend from high dependency wards with high staff:patient ratios on the basis of interpersonally challenging behaviour. A larger study including all hospital inpatients would provide a more representative sample.

Mean substitution was used to replace missing data because the missing values were systematically variant and randomly distributed across the data set. Although this increased the sample size, and therefore the statistical power, the increased risk of a type-I error is acknowledged. This might reduce the variability of the data and cause it to become leptokurtic. However, analyses conducted on the raw data, which included the missing values, produced comparable results; thus no significant differences in the findings were obtained when comparing the raw data with the mean substituted data. Consequently, only the analyses of the mean substituted data have been presented in the results section.

Although the electronic IR1 forms enabled easy access to all incidents that occurred within the institution between 2004 and 2009, it must be acknowledged that the quality and accuracy of the incident data may have limitations, for example, incomplete information regarding incident details. Furthermore, some acts of aggression and self-harm may go unreported. Whether an act is labelled as aggression or self-harm can also be subjective and observer-dependent. Nevertheless, all incidents which are reported are then validated, approved and countersigned by another individual, which should limit such reporting errors.

A final limitation of the current study is related to the use of categorisation or cut-off points when interpreting the AUC values. Whilst ROC curves and AUC values is the most popular metric to capture and measure discrimination (Bamber, 1975; Hanley & McNeil, 1982), there are issues with using cut-off points within statistical analyses because they are arbitrary. As a result, there is huge variability within and between disciplines. However, to allow for comparisons to be made

with existing research in this area, the current study adopted the cut-off points suggested by Dolan and Blackburn (2006).

Recommendations and Implications

The study further supports the use of interpersonal theory as one approach to describing the challenging behaviours that forensic inpatients present whilst in secure settings and highlights the potential role of interpersonal style assessments for risk management and care planning. For example, inpatients with prominent and pervasive dominant and coercive interpersonal styles may require more intensive psychological interventions and more constructive management, including placement within the hospital and interpersonal approaches such as limit setting by staff with other inpatients (Daffern et al., 2013).

Psychological treatments that are intense, include an inpatient therapeutic model, involve a cognitive-behavioural approach and focus on dynamic risk factors, e.g., criminal thinking, have been found to be productive in impacting upon interpersonal style. For example, Daffern et al. (2013) found that those patients that completed psychological treatment which met these characteristics showed a reduction in hostile-dominance, whereas those patients that did not complete the treatment actually showed an increase in hostile-dominance. The reduction in hostile-dominance also reduced the likelihood of those patients re-offending, demonstrating the importance of targeting dysfunctional interpersonal styles during treatment. Secure recovery also places the interpersonal domain at the centre stage of the change process (Drennan et al., 2014).

Educative therapeutic programmes in which both staff and inpatients co-construct their dilemmas and think about the impact and consequences of maladaptive interpersonal styles would be beneficial. Staff should be made aware of interpersonal theory and the impact of responses to challenging behaviours within the forensic hospital setting, particularly the process of complementarity. Connectedly, the National Institute for Health and Care Excellence (NICE; 2004, 2005) recommend that all staff receive ongoing training to recognise the antecedents and risk factors of violence and self-harm, and that staff have an understanding of how their own behaviour

can impact on inpatients. Daffern, Day and Cookson (2012) provide a useful review on the specific applications of interpersonal theory to the care and management of inpatients.

Future Research

The current study was retrospective. A prospective double-blind randomised study comparing the outcomes (i.e. incident rates) between two groups: one group where the CIRCLE is used to predict incidents and the results acted upon, and a second control group where the CIRCLE is not used, would increase the validity of the reported findings. Such a study would remove instrumentation and selection bias, and evaluate whether actions based on CIRCLE scores for each interpersonal style can reduce the incident rate of verbal aggression, physical aggression and/or self-harm.

Conclusion

The results of the current study demonstrate the relevance of measuring interpersonal style to predict incidents of aggression and self-harm within a high-secure institution of forensic mental health inpatients. Dominant and coercive interpersonal styles are robust predictors of aggression and self-harm; thus incidents within the institution may serve an interpersonal function. That is both aggressive and self-harming behaviours are associated with how the aggressive or self-harming individual relates to others within their environment. Assessment of interpersonal style is therefore a valid and recommended process to inform clinical decision-making with implications for integration into clinical strategies to promote pro-social actions. This theory can also be of benefit in staff training to support the range of skills required to contain and lower risk.

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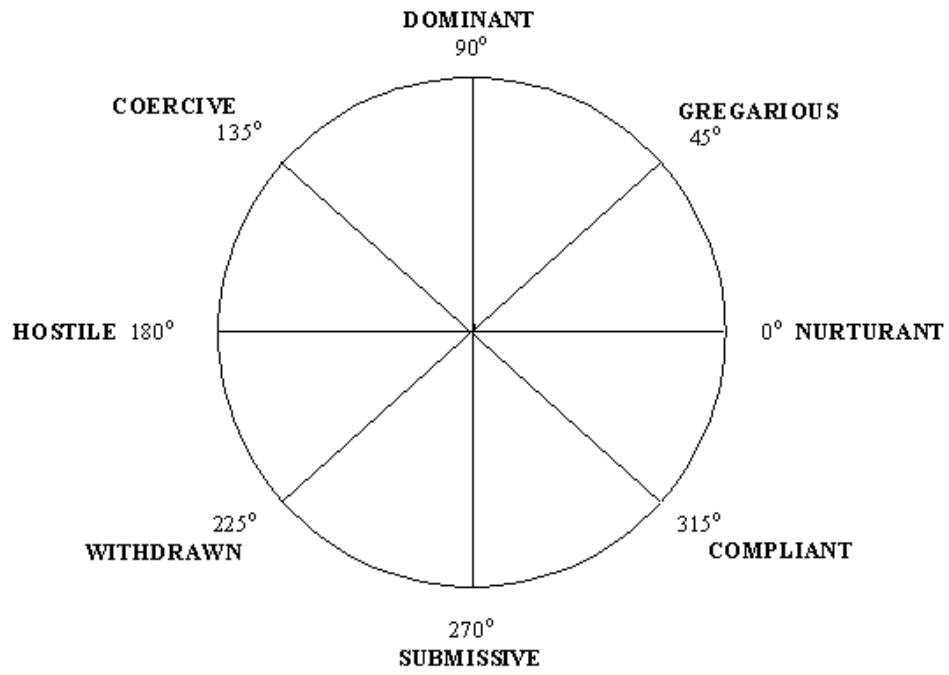


Figure 1: The Octants of the Interpersonal Circle.

Table 1: Reliabilities of the CIRCLE scales across three different studies.

| Scale | Current Study Cronbach's Alpha (No. of Inpatients) | Blackburn & Renwick (1996) Cronbach's Alpha (N = 210) | Blackburn & Glasgow (2006) Cronbach's Alpha (N=589) | Current Study Intra-Class Correlation (No. of Inpatients) | Blackburn & Renwick (1996) Intra-Class Correlation (N=210) | Blackburn & Glasgow (2006) Intra-Class Correlation (N=589) |
|-------|---|--|--|--|---|---|
| DOM | .79 (N=191) | .87 | .82 | .67 (N=191) | .68 | .79 |
| COER | .92 (N=176) | .87 | .93 | .66 (N=176) | .65 | .77 |
| HOST | .82 (N=171) | .84 | .82 | .61 (N=171) | .57 | .62 |
| WITH | .77 (N=187) | .79 | .79 | .54 (N=187) | .66 | .72 |
| SUB | .74 (N=182) | .49 | .74 | .55 (N=182) | .62 | .60 |
| COMP | .70 (N=177) | .85 | .85 | .56 (N=177) | .58 | .65 |
| NURT | .77 (N=193) | .83 | .82 | .50 (N=193) | .55 | .65 |
| GREG | .78 (N=203) | .83 | .84 | .51 (N=203) | .59 | .67 |

Please note: N is not 204 for each of the subscales in the current study because of missing data.

Table 2: Comparison of Mean Ranks on CIRCLE scales in relation to the occurrence and non-occurrence of Incidents at 12-months.

| Variable | Verbal Aggression | | | Physical Aggression | | | Self-Harm | | |
|-------------|-------------------|---------|----------------|---------------------|---------|----------------|-----------|---------|----------------|
| | Mean Rank | | <i>U</i> | Mean Rank | | <i>U</i> | Mean Rank | | <i>U</i> |
| | (Median) | | (Significance) | (Median) | | (Significance) | (Median) | | (Significance) |
| | No | Yes | | No | Yes | | No | Yes | |
| | (N=151) | (N=53) | | (N=163) | (N=41) | | (N=184) | (N=20) | |
| DOM | 94.90 | 124.16 | 2853.500 | 96.91 | 124.73 | 2430.000 | | | |
| | (8.00) | (11.0) | (.002) | (8.00) | (11.00) | (.007) | | | |
| HOST | 100.18 | 109.10 | 3651.500 | 100.02 | 112.38 | 2936.500 | | | |
| | (20.81) | (21.00) | (.343) | (20.73) | (21.00) | (.230) | | | |
| COER | 93.45 | 128.27 | 2635.500 | 95.69 | 129.59 | 2231.000 | 96.93 | 153.73 | 815.500 |
| | (11.00) | (17.00) | (.000) | (11.00) | (17.00) | (.001) | (11.00) | (23.21) | (.000) |

Table 3: Correlations between CIRCLE scales and Incidents at 12-months following baseline assessment.

| Variable | Verbal Aggression (N=204) Rho (Significance) | Physical Aggression (N=204) Rho (Significance) | Self-Harm (N=204) Rho (Significance) |
|-----------------|---|---|---|
| DOM | .234 (.000) | .192 (.003) | |
| HOST | .085 (.113) | .097 (.083) | |
| COER | .289 (.000) | .245 (.000) | .284 (.000) |

Table 4: ROC Data for each of the Incident Types.

| ROC Data | AUC Data | SE | Significance | 95% CI |
|-----------------|----------------------------|------|--------------|-------------|
| Variable | Verbal Aggression | | | |
| DOM | .643 | .043 | .002 | .560 – .727 |
| HOST | .544 | .048 | .344 | .449 – .639 |
| COER | .671 | .043 | .000 | .586 – .755 |
| | Physical Aggression | | | |
| DOM | .636 | .045 | .007 | .549 – .724 |
| HOST | .561 | .050 | .231 | .462 – .659 |
| COER | .666 | .045 | .001 | .577 – .755 |
| | Self-Harm | | | |
| COER | .778 | .046 | .000 | .688 – .869 |

Note: ROC = Receiver Operating Characteristics; AUC = Area Under the Curve;

SE = Standard Error; CI = Confidence Interval.

Table 5: ROC Data comparing short and long admission times for each type of incident.

| ROC Data | | AUC Data | SE | Significance | 95% CI |
|----------------------------------|-----------------|----------------------------|------|--------------|-------------|
| Admission Length Category | Variable | Verbal Aggression | | | |
| Short | DOM | .698 | .049 | .000 | .601 – .795 |
| | HOST | .502 | .056 | .964 | .392 – .613 |
| | COER | .725 | .049 | .000 | .630 – .821 |
| Long | DOM | .570 | .086 | .442 | .401 – .739 |
| | HOST | .651 | .102 | .096 | .451 – .852 |
| | COER | .597 | .090 | .284 | .422 – .773 |
| | | Physical Aggression | | | |
| Short | DOM | .648 | .053 | .015 | .544 – .751 |
| | HOST | .551 | .060 | .401 | .433 – .669 |
| | COER | .690 | .054 | .002 | .584 – .795 |
| Long | DOM | .667 | .084 | .076 | .503 – .832 |
| | HOST | .581 | .096 | .390 | .392 – .770 |
| | COER | .649 | .082 | .114 | .488 – .810 |
| | | Self-Harm | | | |
| Short | COER | .824 | .048 | .000 | .731 – .918 |
| Long | COER | .649 | .127 | .382 | .400 – .899 |

Note: ROC = Receiver Operating Characteristics; AUC = Area Under the Curve; SE = Standard Error; CI = Confidence Interval.