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Staff-reported antecedents to aggression in a post-acute brain injury treatment programme: What are they and what implications do they have for treatment?

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Research in psychiatric settings has found that staff attribute the majority of inpatient aggression to immediate environmental stressors. We sought to determine if staff working with persons with brain injury-related severe and chronic impairment make similar causal attributions. If immediate environmental stressors precipitate the majority of aggressive incidents in this client group, it is possible an increased focus on the management of factors that initiate client aggression may be helpful. The research was conducted in a low-demand treatment programme for individuals with chronic cognitive impairment due to acquired brain injury. Over a six-week period, 63 staff and a research assistant reported on 508 aggressive incidents. Staff views as to the causes of client aggression were elicited within 72 hours of observing an aggressive incident. Staff descriptions of causes were categorised using qualitative methods and analysed both qualitatively and quantitatively. Aggression towards staff was predominantly preceded by (a) actions that interrupted or redirected a client behaviour, (b) an activity demand, or (c) a physical intrusion. The majority of aggressive incidents appeared hostile/angry in nature and were not considered by staff to be pre-meditated. Common treatment approaches can be usefully augmented by a renewed focus on interventions

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aimed at reducing antecedents that provoke aggression. Possible approaches for achieving this are considered.

Keywords: Brain injury; Aggression; Behaviour therapy; Antecedents.

INTRODUCTION

In the psychological study of aggression, researchers have tended to divide aggression into two types: hostile/angry aggression and instrumental aggression (Bandura, 1973). Hostile/angry aggression is associated with high levels of emotional arousal during which a person may lose control of his or her behaviour. Instrumental aggression, on the other hand, is viewed as more planned and purposeful, for example the aggression exhibited by a bank robber. Instrumental aggression does not necessarily include anger. While both types can have a clear purpose (e.g., to remove an irritant or to punish perceived transgression), hostile/angry aggression typically lacks the planned component of instrumental aggression.

Hostile/angry aggression is conceptualised as a response to frustration (Berkowitz, 2008; Dollard, Doob, Miller, Mowrer, & Sears, 1939; Siever, 2008). Frustration may be defined as an individual's reaction to the interruption of some planned or ongoing activity (Averill, 1983) or to the requests from another person that a behaviour or activity occur (Berkowitz, 1989). Hostile/angry aggression can be intrinsically rewarding, for example the sense of accomplishment achieved by a person in punishing another for a perceived slight. However, when it is an impulsive response the role of reinforcement may be less evident. By contrast, instrumental aggression is maintained by environmental contingencies, for example, the obtaining of a desired goal such as status, objects, or the evasion of a demand. Hostile/angry aggression is most often reactive, whereas instrumental aggression can be proactive or reactive.

Aggression in care settings

Aggression in care settings has been well documented (Hahn et al., 2008). Hahn and colleagues (2008) reviewed 31 studies that they rated as being of at least moderate research quality which examined aggression in hospital settings. They observed that several organisational factors appeared related to aggression, including difficult interactions between staff and clients, lengthy waiting times, and frustration with hospital procedures.

Winstanley (2005) proposed that in hospital contexts anxiety provokes hypervigilance for threatening stimuli, leading clients to make negative attributions regarding staff actions and resulting in potentially aggressive

behaviour. This effect may be even more likely in the context of cognitive impairment (Winstanley, 2005; Winstanley & Whittington, 2004). The link between cognitive impairment and aggression in the elderly has been noted by others (Pulsford & Duxbury, 2006).

Winstanley and Whittington (2004) interviewed staff members in a general medical hospital soon after the staff member had been the target of aggression. Qualitative analysis determined that 82.8% of incidents of aggression followed actions by the staff that were likely to have provoked client anxiety. Most commonly, incidents involved staff intervening to prevent a client's intended behaviour. Additionally, in 64% of aggressive incidents the aggressors were displaying impaired cognitive processing likely to have limited their ability to comprehend the true nature of their situation.

An earlier investigation of aggression directed towards psychiatric nurses by Whittington and Wykes (1994) noted similar results. Nurses were interviewed within 72 hours of an assault. Respondents indicated that, overall, 86% of assaults were preceded by presumed aversive stimulation from nursing staff.

The effect of aggression on staff behaviour is mediated at least in part by staff attributions for aggression. Because staff attributions have the potential to alter staff behaviour both pre- and post-aggression, they may be a legitimate treatment target in their own right. According to Weiner's attribution theory (1988) a person's response to another's negative behaviour is directly influenced by his or her judgement about that person's responsibility for, and control of that behaviour. In Weiner's (1980; 1986) attributional model of helping behaviour, people are believed to be more likely to withhold help from another if the cause of the other person's negative behaviour is viewed as controllable by that individual, and arising from factors internal to him or her. However, if the behaviour is attributed to uncontrollable factors, then a staff person is more likely to experience sympathy, which increases the likelihood of helping behaviour.

Weiner's model explaining staff helping behaviour has received support in the clinical literature. An investigation of staff working with people with intellectual disability found that those staff who perceived clients' challenging behaviour as controllable experienced more anger and were more likely to resort to punitive interventions (Leggett & Silvester, 2003). In another study, staff were found to be more sympathetic to clients seen as less responsible for their behaviour (Dagnan & Cairns, 2005). In traumatic brain injury (TBI) Manchester (2002) found rehabilitation staff who made internal attributions for a client's aggression (i.e., attribute aggression to a client's "aggressive" personality) were subsequently more likely to endorse aversive treatment options than staff who did not do so. Barrowclough and McKay (2005) applied Weiner's model to Accident and Emergency (A&E) staff caring for patients presenting with deliberate self-harm. Staff who

attributed deliberate self-harm to controllable, internal, and stable patient factors were more likely to display greater negative affect, less optimism, and less willingness to help the patient.

Aggression posttraumatic brain injury

Aggression is a commonly reported consequence of TBI (Baguley, Cooper, & Felmingham, 2006; Brooks, Campsie, Symmington, Beattie, & McKinlay, 1986). However, literature on TBI often limits discussion of the origins of aggression to demographic and neurological factors such as neurologically mediated "irritability" (Alderman, 2003; Medley & Powell, 2010; Tateno, Jorge, & Robinson, 2003). Ways in which caregivers are to manage moment-to-moment interactions with persons with severe cognitive impairment after TBI has been the subject of only limited attention (Finfgeld-Connett, 2009; Giles & Manchester, 2006; Giles, Wilson, & Dailey, 2009; Pryor, 2006; Yody et al., 2000). This is unfortunate as it omits the potentially large role that staff behaviour may play in eliciting client aggression.

Management of aggression post-acquired brain injury

Functional behavioural analysis (FBA) was central to the development of early interventions in most settings for the treatment of behaviour disorder after TBI (Ylvisaker et al., 2007; Yody et al., 2000). FBA views behaviour as maintained by the reinforcing effects of the environment. Functional assessment and analysis is used to arrive at a formulation about possible contingencies that may be strengthening aggressive behaviour. These contingencies are then manipulated in an attempt to weaken aggressive responses via either extinction or punishment. Initially, FBA-derived treatments tended to have a primary focus on the alteration of consequences for aggression (Fowles & Fox, 1995; Swan & Alderman, 2004; Turner, Green, & Braunling-McMorrow, 1990; Watson, Rutterford, Shortland, Williamson, & Alderman, 2001; Wilson & Barrett, 1998; Ylvisaker et al., 2007; Yody et al., 2000).

However, the manipulation of consequences may be most useful only for the treatment of instrumental aggression. Hostile/angry aggression that is over-learned and automatically triggered by particular stimuli may be less easy to reduce via consequence manipulation. In fact, repeated attempts to teach a person via consequence management is more likely to strengthen the automaticity of aggression as repeated links are made between a trigger and the impulsive aggressive behaviour it elicits. This strengthening effect is possibly mediated via classical conditioning as multiple environmental cues that were previously unconditioned stimuli, for example, requests to engage in activities of daily living, the arrival of staff at the dining table, or the sound of a medication trolley, come to be linked with hyper-arousal and subsequent aggression via repeated pairings.

A lack of consideration given to hostile/angry aggression is consistent with a general tendency for clinicians to underestimate automatic and emotion-driven responses in persons with cognitive deficits (Howe, 2006; Panksepp, 2003). This is curious given that post-aggression reports from persons with TBI often implicate frustration as a cause of aggression rather than any desire to dominate others, or to acquire objects (Baguley et al., 2006; Dooley, Anderson, Hemphill, & Ohan, 2008).

Reviews of the evidence regarding treatment of aggression following TBI describe contingency management approaches as evidence based but suggest that specific behavioural interventions have only limited support (Cattelani, Zettin, & Zoccolotti, 2010; Ylvisaker et al., 2007). Contingency management procedures have been successful in reducing the frequency of behavioural incidents. Nonetheless some reports have described 25–35% of clients as non-responders (Eames, 1992; Eames, Cotterill, Kneale, Storrar, & Yeomans, 1995; Eames & Wood, 1985). Additionally, accelerating rates of behavioural incidents following the application of extinction procedures have been reported in clients with severe impairments (Alderman & Burgess, 1994; Manchester, Hodgkinson, & Casey, 1997).

Typically FBA approaches to aggression have avoided or minimised the role of hostile/angry aggression (Berkowitz, 1989). FBAs that are consequence-based assume that alterations in the desired consequences of aggression will lead to a reduction in aggressive behaviour. However, as noted above, the more frequently the frustrating stimuli trigger the negative cognitive and emotional states, the more the behaviours associated with them become automatic (Bargh & Chartand, 1999). Particular environmental stimuli come to automatically cue certain behaviours, affective states, and goals, for example staff thwarting self-assertion may trigger the response of, "I'll show them who's boss"(Anderson & Bushman, 2002). Aggression may also be a response to perceived wrongs or a desire to maintain desired social or self-identities (e.g., independence, competence) (Anderson & Bushman, 2002; Topalli & O'Neal, 2003).

Although viewed by most authorities on TBI as an effective intervention, recently there has been a move away from an emphasis on consequence-based management strategies. A general trend can be recognised in the literature to utilise approaches that attempt to avoid eliciting frustration-related aggression and avoid the use of extinction procedures that elicit frustration. These approaches have been variously described as relational therapy (Giles & Manchester, 2006), non-aversive (Giles, Wager, Fong, & Waraich, 2005; Giles et al., 2009; Manchester, Hodgkinson, Pfaff, & Nguyen, 1997; Rothwell, LaVigna, & Willis, 1999), errorless rehabilitation (Ducharme & Harris, 2005), intensive positive behavioural supports (Gardner, Bird, Maguire, Carreiro, & Abenaim, 2003), and low arousal (McDonnell, 2010). Slifer and coworkers (1997) reported the successful use of the titration of environmental

and interpersonal stimulation to reduce aggression in the acute rehabilitation of children and adolescents with TBI. They noted the use of consequence-based intervention needs to be managed carefully to avoid negative reactions (Slifer & Amari, 2009).

Although the utility of the hostile/angry vs. instrumental aggression dichotomy has been challenged (Bushman & Anderson, 2001), and its importance minimised by behaviourist theorists (Berkowitz, 1989), there is evidence of two theoretically separable types of aggression which are modified by different factors (Poulin & Boivin, 2000). Hostile/angry aggression is a response to frustration and is affected by attributions (e.g., was the frustrating act deliberate or accidental), relationship factors, level of arousal, damage to medial and orbital frontal structures, history of trauma, prolonged stress, psychosis and affective disorders, and serotonin depletion (Geen, 1990; Grafman et al., 1996; Krakowski, 2003; Nisenbaum, Zigmond, Sved, & Abercrombie, 1991; Silva, Derecho, Leong, Weinstock, & Ferrari, 2001; Summers et al., 2005). Instrumental aggression is directly related to a desire to achieve a goal (e.g., avoidance) and as such is more readily affected by environmental consequences (Bandura, 1973; Berkowitz, 1989, 1990; Poulin & Boivin, 2000). Similarly, people who are aggressive can be divided into two groups, those whose aggression is predominantly hostile/angry, and those whose aggression is predominantly instrumental (Crick & Dodge, 1996; Poulin & Boivin, 2000). As a practical matter, multiple factors are likely to influence the likelihood of an individual engaging in an aggressive behaviour. Aggression is known to occur more frequently in the context of cognitive impairment, other stressors, and non-preferred interpersonal or environmental stimulation (Winstanley, 2005; Winstanley & Whittington, 2004). A particular concern for clinicians may occur when an aggressive act initiated as a response to frustration leads to the termination or escape from the aversive stimuli. Here what was initiated as a hostile response may rapidly become a learned instrumental response, and what could have been avoided by careful antecedent management, must, if allowed to progress, be managed by the alteration of environmental contingencies. We have found that when practitioners have this issue at the forefront of their minds it allows for early prevention and helps to avoid care teams "going down the wrong road" in treatment.

This study reviews staff reports of the interpersonal and demand characteristics that preceded client aggressive incidents occurring during a six-week period in a low-demand programme for persons with severe cognitive impairment after brain injury. We hoped to determine if, as has been found in other client populations, aggression is often preceded by staff-induced stressors (Winstanley, 2005; Winstanley & Whittington, 2004) and is impulsive rather than planned. Based on these findings, a further aim of the study was

to highlight areas where programmatic changes might reduce the frequency of future aggression.

The study was conducted in a low-demand programme for non-responders to more standard intervention programmes (for a detailed description of the programme see Giles et al., 2005). The treatment programme has a philosophy of normalisation, respect, non-confrontation, positive person-centred engagement, support, and functional and behavioural skill development. Staff attempt to inform rehabilitation efforts with an understanding of (a) the client's goals, and (b) recognition of the transactional meanings of interactions. Staff attempt to interrupt the cycle of aversive events believed to increase the availability of negative emotional states and the propensity to be aggressive (Berkowitz, 1989). It is conjectured that by reducing the readiness for "fight or flight", the activation of automatic cognitions and motor sequences that "prime" the individual for aggression may be reduced.

METHOD

Setting and design

The study was conducted in a secure 65-bed programme for persons with acquired brain injury and housed in two units of a skilled nursing facility (SNF) in the San Francisco Bay area in the US. The study used a mixed-model, qualitative to quantitative data analysis including typology development (Dellinger & Leech, 2007; Teddlie & Tashakkori, 2003). Structured measures for the assessment of behavioural incidents such as the OAS-NMR-E (Giles & Mohr, 2007) allow for the rating of the precursors of behavioural incidents, but there is no evidence that they provide for the identification of the full range of potential instigations to aggression in a post-acute neurological population. Therefore, a content analytic method was selected because it has been used to examine the causes of aggression in the psychiatric population, and because it allows for the widest possible range of staff responses (Whittington & Wykes, 1996; Winstanley & Whittington, 2004). A separate quantitative analysis was used to assess for a potential response bias in which staff might under-report their own behaviour as antecedents to aggressive incidents. We also examined whether staff in different professional categories were more or less likely to be the targets of verbal or physical aggression.

Client characteristics

There were 65 clients at the facility during the six-weeks of data collection. The average age of the clients was 48 years (range 23–88) and most clients were male ($n = 51$, 79%). Causes of acquired brain injury were TBI

($n = 28, 44\%$), Huntington's disease ($n = 7, 11\%$), cerebrovascular events ($n = 6, 9\%$), HIV/AIDS ($n = 5, 8\%$), substance-induced ($n = 3, 5\%$), anoxia ($n = 2, 3\%$), toxic encephalopathy ($n = 2, 3\%$), and other ($n = 12, 18\%$).

Indicators of injury severity such as Glasgow Coma Scale score, duration of coma, or duration of post-traumatic amnesia were unavailable. Similarly, date of onset was unobtainable as early records did not follow the clients, and potential family informants often declined contact. Clients were however predominantly many years post-onset. Severe psychiatric symptoms occurred frequently, and mostly began after the neurological onset such that 38 clients (58%) manifested psychosis post-neurological onset, 5 clients (8%) exhibited mania or hypomania post-neurological onset, and 5 clients (8%) had one or more major depressive episodes post-neurological onset. Most clients were admitted because of repetitive physical aggression ($n = 50, 77\%$) with the remainder admitted for other difficult-to-manage behaviours (e.g., inappropriate sexual activity, fire-setting). Some clients (9, 14%) had a history of extreme aggression (e.g., homicide, multiple homicide, attempted homicide, kidnapping, and aggravated sexual assault).

Staff characteristics

Out of 75 staff approached to participate 63 (84%) agreed to do so. One therapist and one registered nurse declined to participate for unknown reasons. The remaining 10 staff who declined to participate were dietary staff who cited limited client contact, or laundry/housekeeping staff who frequently cited poor English language skills when declining to participate. Staff participants were predominantly female (44, 70%) and ranged from 20 to 68 years of age. Staff participants were registered nurses (RN; $n = 4, 6\%$), licensed vocational nurses (LVN; $n = 3, 5\%$), certified nurses aids (CNA; $n = 27, 43\%$), activities staff ($n = 11, 17\%$), other therapeutic or supervisory staff ($n = 3, 5\%$), housekeeping staff ($n = 2, 3\%$) and other ($n = 10, 16\%$) and included persons from all staff disciplines. On-call and front office staff were excluded due to their limited client contact.

Procedure

The appropriate Institutional Review Board gave permission for the study. This study examined the antecedents of aggressive incidents via a detailed analysis of staff interviews conducted as soon as practicable following the incident and all within 72 hours of occurrence. The data reported here were collected as part of a larger study that included the Overt Aggression Scale–modified for neurorehabilitation–version 2 (OAS-MNR-2; Giles & Mohr, 2007). Facility protocol mandates that physical contacts between clients (even when trivial) be reported to facility administration. For the six-week duration of the study the researchers asked staff to report all

aggressive incidents including reports of verbal incidents and aggressive incidents against staff and objects in addition to client-on-client aggression about which the staff routinely reported. The study used the definitions of verbal aggression (e.g., shouted angrily, screamed insults, cursed, made threats) and physical aggression (e.g., swung at people, grabbed, kicked, pushed others) of the OAS-MNR-2 that were already familiar to staff. Consent, was obtained and documented. Staff provided demographic data to a research assistant (RA) approximately 7 days prior to the beginning of the prospective collection of data on aggressive incidents. Staff were asked to report to the RA any verbal or physical aggressive incidents within 72 hours of its occurrence. Throughout the study the RA continued to be descriptive during daily "check-in" with staff (e.g., "Did any clients hit/shout/swear at you today?"). When staff were not scheduled to return to the facility during the 72 hours following an incident, interviews were conducted by telephone. Staff reports were transcribed verbatim. A weekly raffle provided an incentive for staff participation. Staff received a raffle ticket and were entered into a weekly drawing for each reported incident.

Measures

Two questionnaires were designed for this study. Questionnaire 1 included demographic information about staff, e.g., age, job category, duration of employment. It also included a question about staff beliefs regarding the general causes of client aggression.

Questionnaire 2 included closed and open-ended questions intended to obtain as much information as possible regarding the causes of a specific incident that a staff member reported observing, e.g., did anyone approach the client prior to the incident? Did anyone say anything to the client prior to the incident?

Data analysis

Analysis Questionnaire 1.

Descriptive statistics (frequencies and percentages) were used to examine the responses to the demographic questions. Chi-square tests were used to compare the rates of type of aggressive incidents with staff as a target by job category. Staff responses to the question, "In your view why do clients in this facility engage in verbal or physical aggression?" were recorded. Established qualitative methods for typology development and classification were used (Gibbs, 2007; Rubin & Rubin, 1995). Briefly, the principal investigator (PI; GMG) read the written responses repeatedly and placed the statements into categories using "open coding". Using this

analysis, a table of descriptors for the cause of behavioural incidents was devised. Axial coding allowed the descriptors to be categorised using a supra-ordinate interaction type (e.g., activity demand) and a subordinate context subtype (e.g., was asked a question) (see Table 1) (Gibbs, 2007; Rubin & Rubin, 1995).

TABLE 1
Categorisation of antecedents to behavioural incidents reported by staff

Staff-related antecedent	*Client-related antecedent*	*Agitated/Environmental antecedent*
Client behaviour interrupted or redirected	Peer provoked	Agitated / hallucinating
Told "No"	Purposefully provoked by peer	Already agitated
Told to wait/made to wait	Social intolerance (annoyed by peer)	Hallucinating / delusional / manic
Given behaviour feedback	Response to prior incident	Paranoid response / misperception
Desire to leave ignored / prevented	Peer activity demand	Difficulty with environment
Item taken / removed / recovered	Told to stop activity by peer	Over-stimulated (e.g., noise)
Denied food / beverage	Told to get out of the way by peer	Unstructured / under-stimulated
Denied cigarette	Approach / physical contact from peer	Change in routine
Other request denied / ignored	Touched by peer	Other
Client ignored	Approached or greeted by peer	Unknown
Activity demand	Obstructed by peer	
Asked question(s)	Client approached peer	
Given instruction / activity demand	Hit by peer	
Given instruction / eating		
Given instruction / hygiene / transfers		
Implied activity demand		
Difficulty with motor skill		
Communication failure		
Given and object (e.g., meds, food)		
Staff approached / touched client		
Approached or greeted by staff		
Assisted with hygiene / transfers		
Assisted with eating		
Client approached staff		

Analysis for Questionnaire 2.

Similar methods were used for analysis of responses to Questionnaire 2 (the incident questionnaire) as for Questionnaire 1 except that the data analysis included checks on reliability and faithfulness to the staff members' meaning. Methods included mixed-model, qualitative to quantitative data analysis with typology development (Dellinger & Leech, 2007; Teddlie & Tashakkori, 2003). Staff answers to three separate questions on Questionnaire 2 completed for each incident were used: "What happened?", "What was the client doing before the aggressive incident?" and "Was the client demonstrating any indications of anxiety or hallucinations prior to the aggressive incident?" The PI coded the 668 staff statements regarding the causes of the 508 unique aggressive incidents and placed them into broad categories of interaction type (e.g., activity demand) and a more detailed interaction subtype (e.g., was asked a question) see Table 1. The reliabilities of the coding were checked by having a second rater independently assign staff responses to the categories derived by the PI using a convenience sample of the first 130 reported incident (i.e., 20% of the staff reports). Kappa reliabilities and percentage agreement were calculated and were found to be excellent for both the interaction type (.844 and 90%) and the subtype (.917 and 89.2%) (Fleiss, 1981). Consistent with qualitative analysis protocols a panel of six content and method experts provided ongoing external review and feedback by checking staff statements and the PI's thematic analysis to ensure fidelity to the staff description and prevent intrusion of interpretation not founded in the data (Gibbs, 2007; Rubin & Rubin, 1995).

RESULTS

Questionnaire 1.

All staff respondents reported being the target of verbal aggressive incidents ($n = 63$, 100%) at least once during the course of their employment at the facility, and most staff reported being the target of physical aggressive incidents at least once ($n = 47$, 74.2%). Thirty percent of staff ($n = 19$) reported being the target of verbal aggressive incidents one or more times per day whereas only 4.8 percent of staff ($n = 3$) reported being the target of physical aggressive incidents one or more times per day. Chi-square analyses failed to reveal any differences in rates of retrospective staff reports of being a target of verbal or physical aggressive incidents by job classification, age, or time working at the facility. Staff responses to the question, "In your view, why do clients in this facility engage in verbal or physical aggression?" are presented in Table 2. Analysis of staff responses yielded on average more than one conceptualisation per statement (M 1.65).

TABLE 2
Frequency of conceptualisations derived from staff (63) responses to the question "In your view what leads clients in this facility engage in verbal abuse or physical aggression?"

Denial or prohibition		
Frustration/not getting what they want/having to wait	25	(38%)
Frustration/staff being intrusive, impolite, or demanding	10	(16%)
Denied food	4	(6%)
Frustration with rules/prohibitions	3	(5%)
Lack of money	1	(2%)
Lack of attention/being ignored	1	(2%)
	44	(69%)
Activity demand		
Misperception communication difficulties	6	(9%)
Activities of daily living	5	(8%)
Change in routine	4	(6%)
Frustration/activity demand	2	(3%)
	17	(26%)
Environmental		
Other clients behaviour, intrusiveness, assertiveness	12	(19%)
Crowding, overstimulation	10	(16%)
Pain medical problems	2	(3%)
	24	(38%)
Intrinsic to client		
Hallucinations/delusions/psychosis/mania/depression	6	(9%)
Impulse control deficit	4	(6%)
Brain damage	2	(3%)
Aggressiveness	1	(2%)
Natural cycle	1	(2%)
	14	(22%)
Unknown	11	(17%)

Questionnaire 2

There were 668 reports of 508 unique aggressive incidents. Incidents were dichotomised into verbal aggression only vs. any incident that included physical aggression. Of the 508 unique incidents, there were 352 incidents of verbal aggression and 156 incidents that included physical aggression. Mean latency (i.e., time from incident to report) was 12 hours, 15 minutes (*SD* 19 hrs 3 mins) for all staff-reported incidents. A one-way ANOVA failed to show significant differences in latencies between target categories (i.e., staff, peers, objects, other). Staff were reported to be targets more frequently than were clients. An analysis including only staff and clients as targets was conducted (i.e., excluding objects, self, no-target, family). Incidents of individual staff and multiple staff being targets were combined and counted as one incident: The same was done for client and multiple

clients. Staff were reported to be targets 325 times (238 verbal, 87 physical), and clients were reported to be targets 104 times (85 verbal, 19 physical).

Staff reports of antecedents to aggressive incidents

Staff-reported antecedents for staff, clients, and objects as targets are reported in Table 3 and a more detailed description of incidents directed towards staff only is reported in Table 4. The average rate of antecedents coded was 1.30 for incidents with staff as a target and 1.28 for incidents with clients as a target. Aggressive incidents directed towards staff are observed by staff to result from (a) actions that interrupted or redirected a client behaviour (37.6%), (b) activity demand (21%), or (c) staff approach, or physical intrusion (21.3%). Aggressive incidents directed at peers were most often observed to be preceded by verbal confrontation from the targeted peer (51.5%) or physical contact/assault from the peer (26.1%).

We looked for the presence of a response bias in which staff might under-report their own behaviour as antecedents. Staff did implicate other staff as antecedents to aggressive incidents, but they were over eight times more likely to implicate themselves rather than other staff as causing an aggressive incident, suggesting the absence of a bias to under-report themselves as antecedents.

The relationship between type of aggressive incident and staff position

To examine type of aggressive incident by staff position, job categories for clinical staff were collapsed into three: licensed nursing staff (RN/LVN),

TABLE 3
Antecedent category (interaction) totals by target type

	Target					
Antecedent categories	*Staff*		*Clients*		*Objects*	
Client behaviour interrupted or redirected	157	37.6%	4	2.9%	20	31.2%
Activity demand	94	21%	4	2.9%	18	27.1%
Staff approached/touched client	90	21.3%	0	0%	3	4.5%
Peer provoked/purposive or intolerance	8	2%	69	51.5%	4	6%
Peer activity demand	0	0%	2	1.4%	2	3%
Approach/physical contact from peer	4	1.4%	35	26.1%	1	1.5%
Agitated/hallucinating	38	9%	10	7.5%	10	15%
Difficulty with environment	17	4%	7	5.2%	3	4.4%
Other/unknown	14	3.3%	3	2%	5	7.4%
Totals	423	100%	134	100%	66	100%

TABLE 4
Antecedents (interaction types and context subtype) frequency and percentages when staff are the target

Staff-related antecedent	*Frequency*	*Percentage*
Client behaviour interrupted or redirected		
Preferred activity prohibited (told "Don't do X")	10	2.5%
Told "No"	22	5.5%
Told to/made to wait	28	6.6%
Told of consequences/given behaviour feedback	21	5.0%
Desire to leave ignored/prevented	7	1.7%
Item taken/removed/recovered	6	1.4%
Denied food/beverage	20	4.7%
Denied cigarette	18	4.3%
Other request denied/ignored	20	4.7%
Client ignored	5	1.2%
	157	37.6%
Activity demand		
Asked a question	12	2.8%
Given directive/activity demand (general)	34	8.0%
Given directive/activity demand (eating)	7	1.7%
Given directive/activity demand (hygiene/transfers, etc.)	25	5.9%
Implied activity demand	2	0.5%
Frustrated with activity/object	1	0.2%
Communication failure	5	1.2%
Client given something (e.g., medication, food, clothing)	8	1.9%
	94	21%
Staff approach interruption physical contact		
Approached/greeted by staff	24	5.7%
Physical assistance for hygiene/transfers, etc.	54	12.8%
Physical assistance for eating	12	2.8%
Client approached staff	1	0.2
	90	21.3%
Agitated hallucinating		
Already agitated	19	4.5%
Hallucinating/delusional/manic	13	3.1%
Paranoid response/misperception	6	1.4%
	38	9%
Environmental stressors		
Overstimulated	10	2.4%
Unstructured/under stimulated	1	0.2%
Change in routine	6	1.4%
	17	4.0%
Interaction with peer	12	2.8%
Other	14	3.3%
Total	423	100%

Antecedents reported exceed the number of staff reported incidents.

certified nurses aides (CNA) and recreation therapists, occupational therapists and therapy assistants (activities/rehab). Non-clinical staff (e.g., housekeeping staff) were targeted 12.2% of the time and were excluded from further analysis. Duplicate reports of the same incident were excluded. Activities/rehab staff were most frequently reported to be targets with 41.4% of the total aggressive incidents (141 verbal, 69 physical). CNAs were the next most frequent reported targets with 27% of the total aggressive incidents (83 verbal, 54 physical). RN/LVN were least likely to be reported targets, with 19.3% of the total aggressive incidents (84 verbal, 14 physical). Using a z test, we examined whether the ratios of verbal to physical aggressive incidents differed between job categories. The RN/LVN ratio of verbal aggressive incidents to physical aggressive incidents (.317) was significantly different than the ratio for the CNAs (.770) ($z = 7.57$, $p = .000$). The RN/LVN ratio also was significantly lower than the activities/rehab (.657) ($z = 6.48$, $p = .000$). The CNA staff ratio and activities/rehab ratios, although not as far apart, were also significantly different ($z = 2.185$, $p = .029$). Episodes directed towards RN/LVNs were the least likely to be physical. Activities/rehab staff were the most likely to have physical episodes directed against them with the rate of physical episodes directed at CNAs being intermediate.

DISCUSSION

Staff in a low demand brain injury treatment programme providing long-term residential care are the frequent target of both verbal and physical aggression. Staff are more frequent targets of client aggression than are clients by a ratio of 3:1. When asked at the beginning of the study to respond to the general question, "In your view why do clients in this facility engage in verbal or physical aggression?", 71% of staff accounts implicated an irritable reaction to an environmental stressor, (i.e., hostile/angry aggression). Only 11% of staff accounts reference factors intrinsic to the client, e.g., brain damage, or an impulse control deficit. When asked about causes shortly after observing a specific aggressive incident in which staff were a target, staff implicated some type of external frustration even more frequently (83.9%). Staff implicated client intrinsic factors in only 9% of reports when staff were a direct target.

Aggressive incidents directed towards staff were observed by staff to result from (a) actions that interrupted or redirected a client behaviour on 37.6% of occasions (e.g., told "no"), (b) activity demand on 21% of occasions (e.g., being asked a question), or (c) staff approach, or physical intrusion on 21.3% of occasions (e.g., approached or greeted by staff). Aggressive incidents directed at peers were most often observed to be preceded by verbal

confrontation from the targeted peer (51.5%) or physical contact/assault from the peer (26.1%).

Treatment implications

Careful management of clients in this type of treatment programme can reduce, but probably never eliminate hostile/angry aggression. Even high quality care of profoundly impaired clients with brain injury will regularly require staff to be intrusive.

Many severely neurologically impaired clients have a limited behavioural repertoire and their behavioural dysregulation is often highly predictable (i.e., if x happens, client y will shout). It may be that in describing the causes of client aberrant behaviours staff in this study are assuming the level of handicap caused by obvious and gross cognitive impairment. They therefore tend to focus more on the proximate external causes they frequently observe (e.g., being offered food or activities of daily living care). Thus, staff negative attributions may occur less frequently in a highly impaired population such as this one. In contrast, clients with less obvious handicaps may be more likely to elicit "normal world" explanations for aberrant behaviour (e.g., moral weakness, personality problems). An implication of these findings is that staff who make internal personality-based attributions for aggression can be helped to take greater account of other external factors beyond the clients' control that affect the likelihood of aggression. Examples of mitigating information that may alter staff attributions in the desired direction include information about severity of brain injury and cognitive impairment, levels of confusion and emotional distress, and client histories of trauma and abuse. Given that staff behaviour is clearly implicated as a significant precursor for client aggression in both this study and studies of different client populations (Hahn et al., 2008; Whittington & Wykes, 1996), altering staff attributions of responsibility and controllability may be a major avenue for positive interventions in this population. This is because more benign attributions by staff decrease the likelihood of staff responding aversively to a client's aggression. Indeed, such an approach is now advocated as one part of a comprehensive cognitive behavioural programme for staff working with aggression in psychiatry (Meaden & Hacker, 2011).

In this study, when asked generally about how often staff perceived themselves to be the subject of assault, reports did not show any difference by grade or discipline, however, an analysis of the actual reports of incidents did show significant differences. In studies of acute psychiatric and general hospitals, licensed nurses are reported to be the most frequent target of aggression. In the current setting, however, licensed nursing staff were far less likely to be a target of physical aggression than either the CNAs or the activities/rehab staff. Staff themselves accounted for this data by pointing

to the facility's social hierarchy as perceived by clients in which licensed nurses are at the top, CNAs in the middle, and activities/rehab aids at the bottom. CNAs reported that they were hit more often than other staff due to frequent engagement in activities of daily living which place them "in the line of fire." These explanation are however speculative.

Richter (2006) refers to his own studies in psychiatry that have shown younger, less experienced staff to be at greater risk of assault. In considering why this might be so he suggests one reason may be staff having unrealistic confidence in their personal skills. However, there are other possible reasons to account for this finding. It is possible younger and less qualified staff are more likely to be expected to perform more intrusive tasks that carry increased risk of aggression, for example, assisting with self-care. Although grade/level has been shown to be a significant factor in assaults, reports on the direction have been inconsistent. Whittington and Wykes (1994) reported that grade/level differed significantly between assaulted and non-assaulted groups of staff. These researchers found student nurses, staff nurses and charge nurses were more likely to be assaulted than nursing assistants. However, Convey (1986) reported that nursing assistants were more likely to be assaulted than registered nurses. It may be that reporting only on age or level of qualification misses important factors such as the respective interpersonal tasks staff are being asked to perform immediately prior to being assaulted.

The conceptualisation of hostile/angry aggression may be particularly useful with a population of individuals who can be characterised as (a) irritable, (b) having a limited and inflexible behavioural repertoire, and (c) being exceptionally environmentally dependent. A range of factors could potentially account for these characteristics. Factors include damage to orbital-frontal brain regions, reducing response inhibition, as well as damage to temporal structures, increasing irritability and hostility. These behaviour changes may then be maintained due to impaired learning from environmental contingencies resulting from impairments in memory, social perception, and impairments in the ability to learn from negative consequences. Additionally, the prolonged stress of loss of freedom and self-determination experienced by clients may result in a hyper-reactivity as clients come to be sensitised to even minimal perceived slights. Perseveration of responses that are no longer reinforced is a feature of neurological impairment and in particular damage to frontal brain systems. Taken together, a reliance on consequence-based behaviour management approaches in this population may fail to address fully the true causes of aggression while simultaneously increase aggressive behaviour over the longer term as the same antecedents continue to occur.

Finfgeld-Connet (2009) used a meta-synthesis of seven qualitative studies to outline a method of therapeutic management of aggressive interactions

with clients with brain injury. The method was captured by the metaphor *entering the patient's world*. In this approach, interactions are based on knowledge of the client "behind" the aggression: Client negativity is de-emphasised, and interactions are structured so as to normalise the clients' experiences. An example of this type of approach used in our own service is a client 23 years post-severe TBI who believes that he is a billionaire and that people are stealing his money. The client has failed placement at multiple prior facilities and multiple medication trials have not affected his delusional beliefs. The client will "jokingly" suggest to staff that they are stealing from him and if they joke back he punches them. At the time of writing we have managed this client without assault for longer than any facility in the last 5 years (13 months) by having him meet daily with staff whom he trusts to review any areas of concern, attempting to assist him to solve any perceived problems, reviewing his finances with him weekly and having him sign-off on any expenditure. We attempt to normalise his concerns (e.g., "most people are concerned around money"). Additionally, staff respond to any of his questions about money by stating that taking money from him is unlawful and that if staff stole from him they would go to jail. This increased focus on interpersonal factors and the therapeutic relationship attempts to reduce client anxiety, stress, and negative attributional bias.

Limitations of the study

Although TBI represents the largest single cause of disability in this study the population was heterogeneous in origin of neurological impairment (Giles et al., 2005). Systematic ways used to describe treatment populations (e.g., coma duration) were largely unavailable so it is difficult to establish the comparability of this study population to others described in the literature with regard to severity of neurological insult. Although incident-based, this study used self-report data and has the common limitations associated with this type of data. Despite this, participation levels were high and staff were willing to report incidents. Within the psychiatric literature, staff accounts of the antecedents to aggressive behaviour in which they were the target have been found to be reliable with little tendency to avoid their own roles in incidents (i.e., "whitewash") the reports (Whittington & Wykes, 1996). Although the tools to assess response bias in this study were limited we too found no evidence of this type of bias.

The research design used was mixed-model with both qualitative and quantitative components. While the antecedent interaction types and subtypes were developed using qualitative methods, assessed reliability was high and similar to that reported elsewhere using similar methods (Whittington & Wykes, 1996).

CONCLUSIONS

Aggressive episodes in this long-term treatment population appear to be precipitated by clearly identifiable triggers and result from subsequently induced hostile/angry aggression. Staff report aggressive incidents to be a response to the types of environmental irritants that affect people generally, for example, goal frustration, and interpersonal stress. This finding is consistent with recent reports in the psychiatric literature and is one of the first reports to extend this finding to severely cognitively impaired persons with acquired brain injury. It suggests alternative interventions to the standard consequence contingency management approaches may be more helpful with this population. In particular, interventions that address factors known to increase aggressive-response inhibition (e.g., relationship factors) or that reduce hostile aggression such as forewarning clients of aversive stimulation, and that normalise and validate client experiences may be more helpful. Rehabilitation efforts need to be informed by an understanding of (a) the client's goals, and (b) recognition of the transactional meanings of interactions. Similarly, escalating cycles of aggression and aversive triggers may be reduced by helping staff alter their attributions of client control of, and responsibility for, aggression. By using these principles, staff can interrupt the cycle of aversive events believed to increase the availability of negative emotional states and the propensity to be aggressive.

REFERENCES

Alderman, N. (2003). Contemporary approaches to the management of irritability and aggression following traumatic brain injury. *Neuropsychological Rehabilitation*, *13*, 211–240.

Alderman, N., & Burgess, P. W. (1994). A comparison of treatment methods for behaviour disorder following Herpes Simplex encephalitis. *Neuropsychological Rehabilitation*, *4*, 31–48.

Anderson, C. A., & Bushman, B. J. (2002). Human aggression. *Annual Review of Psychology*, *53,* 27–51.

Averill, J. R. (1983). Studies on anger and aggression: Implications for theories of emotion. *American Psychologist*, *38,* 1145–1160.

Baguley, I. J., Cooper, J., & Felmingham, K. (2006). Aggressive behavior following traumatic brain injury: How common is common? *Journal of Head Trauma Rehabilitation*, *21*, 45–56.

Bandura, A. (1973). Psychological mechanisms of aggression. In R. G. Geen & E. I. Donnerstein (Eds.), *Aggression: Theoretical and empirical views* (Vol. 1, pp. 1–40). New York, NY: Academic Press.

Bargh, J. A., & Chartand, T. L. (1999). The unbearable automaticity of being. *American Psychologist*, *54*, 462–479.

Barrowclough, C., & MacKay, N. (2005). Accident and emergency staff's perceptions of deliberate self-harm: Attributions, emotions and willingness to help. *British Journal of Clinical Psychology.*, *44*, 255–267.

Berkowitz, L. (1989). Frustration-Aggression Hypothesis: Examination and reformulation. *Psychological Bulletin*, *106*, 59–73.

Berkowitz, L. (1990). On the formation and regulation of anger and aggression: A cognitive-neoassociationist analysis. *American Psychologist*, *45*, 494–503.

Berkowitz, L. (2008). On the consideration of automatic as well as controlled psychological processes in aggression. *Aggressive Behavior*, *34,* 117–129.

Brooks, D. N., Campsie, L., Symmington, C., Beattie, A., & McKinlay, W. (1986). A five year outcome of severe blunt head injury. A relative's view. *Journal of Neurology, Neurosurgery, and Psychiatry*, *49,* 764–770.

Bushman, B. J., & Anderson, C. A. (2001). Is it time to pull the plug on the hostile versus instrumental aggression dichotomy? *Psychological Review*, *108,* 273–279.

Cattelani, R., Zettin, M., & Zoccolotti, P. (2010). Rehabilitation treatments for adults with behavioral and psychosocial disorders following acquired brain injury: A systematic review. *Neuropsychological Review*, *20,* 52–85, doi: 10.1007/s11065-009-9125-y.

Convey, J. (1986). A record of violence. *Nursing Times*, *82,* 36–38.

Crick, N. R., & Dodge, K. A. (1996). Social information-processing mechanisms on reactive and proactive aggression. *Child Development*, *67,* 993–1002.

Dagnan, D., & Cairns, M. (2005). Staff judgements of responsibility for the challenging behaviour of adults with intellectual disabilities. *Journal of Intellectual Disability Research*, *40,* 95–101.

Dellinger, A. B., & Leech, N. L. (2007). Towards a unified validation framework in mixed method research. *Journal of Mixed Methods Research*, *1,* 309–332.

Dollard, J., Doob, L., Miller, N., Mowrer, O., & Sears, R. (1939). *Frustration and aggression*. New Haven, CT: Yale University Press.

Dooley, J. J., Anderson, V., Hemphill, S. A., & Ohan, J. (2008). Aggression after paediatric traumatic brain injury: A theoretical approach. *Brain Injury*, *22*, 836–846.

Ducharme, J. M., & Harris, K. E. (2005). Errorless embedding for children with on-task and conduct difficulties: Rapport based, success focussed intervention in the classroom. *Behavior Therapy*, *36,* 213–222.

Eames, P. (1992). Hysteria following brain injury. *Journal of Neurology, Neurosurgery, and Psychiatry*, *55,* 1046–1053.

Eames, P., Cotterill, G., Kneale, T. A., Storrar, A. L., & Yeomans, P. (1995). Outcome of intensive rehabilitation after severe brain injury. *Brain Injury*, *10*, 631–650.

Eames, P., & Wood, R. L. (1985). Rehabilitation after severe brain injury: A follow-up study of a behavior modification approach. *Journal of Neurology, Neurosurgery, and Psychiatry*, *48,* 613–619.

Finfgeld-Connett, D. (2009). Management of aggression among demented or brain-injured patients. *Clinical Nursing Research*, *18*, 272–287, doi: 10.1177/1054773809337577.

Fleiss, J. L. (1981). *Statistical methods for rates and proportions,* (2nd edn.). New York, NY: Wiley.

Fowles, G. P., & Fox, B. A. (1995). Competency to consent to treat and informed consent in neurobehavioral rehabilitation. *Clinical Neuropsychologist*, *9,* 251–257.

Gardner, R. M., Bird, F. L., Maguire, H., Carreiro, R., & Abenaim, N. (2003). Intensive positive behavior supports for adolescents with acquired brain injury: Long-term outcomes in community settings. *Journal of Head Trauma Rehabilitation*, *18*, 52–74.

Geen, R. G. (1990). *Human aggression*. Milton Keynes: Open University Press.

Gibbs, G. (2007). *Analyzing qualitative data*. Thousand Oaks, CA: Sage Publications.

Giles, G. M., & Manchester, D. (2006). Two approaches to behavior disorder after traumatic brain injury. *Journal of Head Trauma Rehabilitation*, *21*, 168–178.

Giles, G. M., & Mohr, J. D. (2007). Overview and inter-rater reliability of an incident-based rating for aggressive behaviour following traumatic brain injury: The Overt Aggression Scale–Modified for Neurorehabilitation–Extended (OAS-MNR-E). *Brain Injury*, *21*, 505–511.

Giles, G. M., Wager, J., Fong, L., & Waraich, B. S. (2005). Twenty-month effectiveness of a non-aversive, long-term, low cost programme for persons with persisting neurobehavioural disability. *Brain Injury*, *19*, 753–764.

Giles, G. M., Wilson, J., & Dailey, W. (2009). Non-aversive treatment of repetitive absconding behaviour in clients with severe neuropsychiatric disorders. *Neuropsychological Rehabilitation*, *19*, 28–40.

Grafman, J., Schwab, K., Warden, D., Pridgen, A., Brown, H. R., & Salazar, A. M. (1996). Frontal lobe injuries, violence, and aggression: A report of the Vietnam Head Injury Study. *Neurology*, *46*, 1231–1238.

Hahn, S., Zeller, A., Needham, I., Kok, G., Dassen, T., & Halfens, R. J. G. (2008). Patient and visitor violence in general hospitals: A systematic review of the literature. *Aggression and Violent Behavior*, *13*, 431–441.

Howe, E. G. (2006). Do we undervalue feelings in patients who are cognitively imparied? *Journal of Clinical Ethics*, *17*, 291–301.

Krakowski, M. (2003). Violence and serotonin: Influence of impulse control, affect regulation, and social functioning. *Journal of Neuropsychiatry and Clinical Neurosciences*, *15,* 294–305.

Leggett, J., & Silvester, J. (2003). Care staff attributions for violent incidents involving male and female patients: A field study. *British Journal of Clinical Psychology*, *42,* 393–406.

Manchester, D. (2002). *Staff attributions for aggression and the acceptability of psychological treatments in brain injury rehabilitation*. Doctoral thesis, Surrey University.

Manchester, D., Hodgkinson, A., & Casey, T. (1997). Prolonged, severe behavioural disturbance following traumatic brain injury: What can be done? *Brain Injury*, *11*, 605–617.

Manchester, D., Hodgkinson, A., Pfaff, A., & Nguyen, F. (1997). A non-aversive approach to reducing hospital absconding in a head-injured adolescent boy. *Brain Injury*, *11,* 271–277.

McDonnell, A. (2010). *Managing aggressive behaviour in care settings: Understanding and applying low arousal approaches*. Chichester, UK: Wiley Blackwell.

Meaden, A., & Hacker, D. (2011). *Problematic and risk behaviours in psychosis. A shared formulation approach*. London: Routledge.

Medley, A. R., & Powell, T. (2010). Motivational interviewing to promote self-awareness and engagement in rehabilitation following acquired brain injury: A conceptual review. *Neuropsychological Rehabilitation*, *20*, 481–508.

Nisenbaum, L. K., Zigmond, M. J., Sved, A. F., & Abercrombie, E. D. (1991). Prior exposure to chronic stress results in enhanced synthesis and release of hippocampal norepinephrine in response to novel stressors. *Journal of Neuroscience*, *11*, 1478–1484.

Panksepp, J. (2003). At the interface of the affective, behavioral, and cognitive neurosciences: Decoding the emotional feelings of the brain. *Brain and Cognition*, *52,* 4–14.

Poulin, F., & Boivin, M. (2000). Reactive and proactive aggression: Evidence of a two factor model. *Psychological Assessment*, *12,* 115–122.

Pryor, J. (2006). What do nurses do in response to their predictions of aggression? *Journal of Neuroscience Nursing*, *38*, 177–182.

Pulsford, D., & Duxbury, J. (2006). Aggressive behaviour by people with dementia in residential care settings: A review. *Journal of Psychiatric Mental Health Nursing*, *13*, 611–618.

Richter, D. (2006). Non-physical conflict management and de-escalation. In D. Richter & R. Whittington (Eds.), *Violence in mental health settings* (pp. 125–144). New York, NY: Springer.

Rothwell, N. A., LaVigna, G. W., & Willis, T. J. (1999). A non-aversive rehabilitation approach for people with severe behavior problems resulting from brain injury. *Brain Injury*, *13*, 521–533.

Rubin, H. J., & Rubin, I. S. (1995). *Qualitative interviewing: The art of hearing data*. Thousand Oaks, CA: Sage Publication.

Siever, L. J. (2008). Neurobiology of aggression and violence. *American Journal of Psychiatry*, *165,* 429–442.

Silva, J. A., Derecho, D. V., Leong, G. B., Weinstock, R., & Ferrari, M. M. (2001). A classification of psychological factors leading to violent behavior in posttraumatic stress disorder. *Journal of Forensic Science*, *46*, 309–316.

Slifer, K. J., & Amari, A. (2009). Behavior management for children and adolescents with acquired brain injury. *Developmental Disabilities Research Review*, *15,* 144–151. doi: 10.1002/ddrr.60.

Slifer, K. J., Tucker, C. L., Gerson, A. C., Sevier, R. C., Kane, A. C., Amari, A., et al. (1997). Antecedent management and compliance training improve adolescents' participation in early brain injury rehabilitation. *Brain Injury*, *11*, 877–889.

Summers, C. H., Korzan, W. J., Lukkes, J. L., Watt, M. J., Forster, G. L., Øverli, Ø., et al. (2005). Does serotonin influence aggression? Comparing regional activity before and during social interaction. *Physiological and Biochemical Zoology*, *78*, 679–694.

Swan, L., & Alderman, N. (2004). Measuring the relationship between overt aggression and expectations: A methodology for determining clinical outcomes. *Brain Injury*, *18*, 143–160.

Tateno, A., Jorge, R. E., & Robinson, R. G. (2003). Clinical correlates of aggressive behavior after traumatic brain injury. *Journal of Neuropsychiatry and Clinical Neuroscience*, *15,* 155–160.

Teddlie, C., & Tashakkori, A. (2003). *Foundations of mixed methods research: Integrating qualitative and quantatative methods in the social and behavioral sciences*. Thousand oaks, CA: Sage Publications.

Topalli, V., & O'Neal, E. C. (2003). Retaliatory motivation enhances attributions of hostility when people process ambiguous social stimuli. *Aggressive Behavior*, *29,* 155–172. doi: 10.1002/ab.10068.

Turner, J. M., Green, G., & Braunling-McMorrow, D. (1990). Differential reinforcement of low rates of responding (DRL) to reduce dysfunctional social behaviors of a head injured man. *Behavioral Residential Treatment*, *5*, 15–27. doi: 10.1002/bin.2360050103.

Watson, C., Rutterford, N. A., Shortland, D., Williamson, N., & Alderman, N. (2001). Reduction of chronic aggressive behaviour 10 years after brain injury. *Brain Injury*, *15*, 1003–1015.

Weiner, B. (1980). A cognitive (attribution)-emotion-action model of helping behaviour: An analysis of judgements of help giving. *Journal of Personality and Social Psychology*, *39,* 186–200.

Weiner, B. (1986). *An attributional theory of motivation and emotion*. Berlin: Springer-Verlag.

Weiner, B. (1988). Attribution theory and attribution therapy, some theoretical observations and suggestions. *British Journal of Clinical Psychology*, *27,* 93–104.

Whittington, R., & Wykes, T. (1994). Going in strong. Confrontive coping by staff. *Journal of Forensic Psychiatry*, *5,* 609–614.

Whittington, R., & Wykes, T. (1996). Aversive stimulation by staff and violence by psychiatric patients. *British Journal of Clinical Psychology*, *35,* 11–20.

Wilson, S., & Barrett, C. (1998). Restoring homeostasis in a residential care facility through behaviour modification. *International Journal of Nursing Practice*, *4*, 51–57.

Winstanley, S. (2005). Cognitive model of patient aggression towards health care staff: The patient's perspective. *Work & Stress*, *19*, 340–350.

Winstanley, S., & Whittington, R. (2004). Aggression towards health care staff in a UK general hospital: Variation among professions and departments. *Journal of Clinical Nursing*, *13,* 3–10.

Ylvisaker, M., Turkstra, L., Coehlo, C., Yorkston, K., Kennedy, M. G., Sohlberg, M. M., et al. (2007). Behavioral interventions for children and adults with behavior disorders after TBI: A systematic review of the evidence. *Brain Injury*, *21*, 769–805.

Yody, B. B., Schaub, C., Conway, J., Peters, S., Straus, D., & Helsinger, S. (2000). Applied behavior management and acquired brain injury: Approaches and assessment. *Journal of Head Trauma Rehabilitation*, *15*, 1041–1060.

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