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# Reflections on Dobermanns, poodles, and social rehabilitation for difficult-to-serve individuals with traumatic brain injury

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#### Introduction

In workshops dealing with social rehabilitation of adolescents and young adults with brain injury, we often show a cartoon of a once proud Dobermann pinscher, now with a look of panic and despair in his eyes as he throws himself out of a second-story window. The caption reads, 'The Dobermann threw himself out the second-storey window soon after he realized the family had indeed named him "Binky".' Veterans of brain injury rehabilitation recognize immediately that the Dobermann represents that clinically challenging population of risk-taking adolescents and young adults who sometimes find themselves after a severe brain injury in a situation that they interpret as *binkification*—the typically counterproductive process of attempting to transform tough Dobermanns into passive and 'socially appropriate' poodles.

We follow this with a cartoon showing two dogs seated on a delicate pink Victorian settee. One of the dogs is a dainty poodk with freshly coiffed white hair. The other is a tough looking Dobermann-type dog with a frightening studded collar around his bull neck. The poodk is barking into the ear of Spike the Stud Dog, who has his eyes shut as tight as possible, resisting the dreaded words, 'Spike, that behaviour is simply inappropriate!' Our comment: 'This, folks, is binkification; furthermore (pointing to Spike), this is the predictable result of illconceived binkifying attempts.'

Although anybody at any age can have an accident that results in traumatic brain injury (TBI), the population is disproportionately dominated by adolescent and young adult males, many of whom led risky and sometimes checkered lives prior to their injury. The subpopulation to which we direct our attention in this article includes adolescents and young adults with TBI whose high degree of oppositionality and resistance to professional efforts to shape their goals and behaviour create significant challenges for rehabilitation specialists. Many, though not all, of these individuals demonstrated oppositional behaviour prior to their injury. We currently work with young adults with an additional pre-injury history of serious substance abuse and conflict with the law, although this degree of antisocial behaviour is not part of our operational definition of 'Dobermann'.

In capitalizing on the metaphorical meaning offered by the terms Dobermann

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and poodle, we certainly do not intend to communicate lack of respect for the people we serve or the professionals who serve them. Indeed, many of the individuals with whom we have worked in recent years have found the Dobermann–poodle analogy helpful in attempting to understand their difficultly with social reintegration after the injury and their resistance to some of the professional services offered to them in good faith. Several urged us to share the metaphor with other rehabilitation professionals.

The intervention perspective presented in this article has been shaped by our experiences in community reintegration efforts for individuals with chronic impairment after brain injury. For several years we served school-age adolescents whose difficulties in the months and years after school re-entry typically had a behavioural component, most often associated with ongoing academic, communication and cognitive impairment. More recently, we have worked with over 325 young adults through a statewide community support project. Individuals are referred to this state health department programme if they have a history of TBI, have evidenced difficulty with community reintegration, and have been identified by staff, the court system, family members, or others as particularly difficult to serve with standard therapeutic services and community supports. An overwhelming majority of the members of this clinical population evidence the characteristics of Dobermanns, listed earlier.

Furthermore, the cost of serving or maintaining these individuals, based on conservative New York State Health Department estimates of costs for the year before their introduction to the programme, exceeds \$30,000,000 annually. Because most were more than five years post-injury at the time of referral and had failed in previous rehabilitation attempts, the state had projected staggering costs for lifetime care for this subpopulation.

The goal of this article is to outline and illustrate an approach to social rehabilitation designed for those adolescents and young adults with chronic social integration problems after TBI, who count themselves among the Dobermanns of this world. Although our selection of this subpopulation restricts the scope of the article, the individuals in focus deserve special attention because of their resistance to traditional rehabilitation efforts and because of the extraordinary social and economic costs associated with failure to help them achieve satisfying lives outside restrictive medical, rehabilitation, or penal settings. In our judgement, the approach applies to many members of other disability groups as well, including young people with attention deficit/hyperactivity disorder (Hallowell and Ratey 1994), oppositional-defiant disorder, and autism and other developmental disabilities (Carr *et al.* 1994).

The approach to intervention and support described in this article weaves together themes highlighted in antecedent-focused applied behaviour analysis (Carr *et al.* 1998), contextualized cognitive rehabilitation (Ylvisaker and Feeney 1998), linguistic philosophy (Lakoff and Johnson 1980, 1998), and counselling aimed at helping individuals fashion a self-concept that is emotionally satisfying, offers intrinsic motivation, and is adequately consistent with both their pre-injury understanding of self and the new constraints and possibilities of post-injury life (Frankl 1984, Lewis and Rosenberg 1990, Harlan 1994, Pollack 1994). A fundamental challenge for TBI rehabilitation specialists is to answer the questions, 'What can be done to help Dobermanns who now live in a world in which they may perceive the well intended behaviour of helpers as Binkification, to which they increasingly react with oppositional Dobermann behaviour? How can rehabilitation specialists help them become successful, controlled Dobermanns who lead satisfying lives consistent with the needs of the everyday people in their social, vocational and familial worlds?'

After briefly describing contributors to social and behavioural outcome after TBI, we sketch in general terms a contextualized, everyday routine-based approach to intervention, highlight the procedures that are critical to the success of this approach and illustrate the approach with case material. We close with comments about evidence of effectiveness.

#### Social disability after TBI

Personality changes, including increases in challenging behaviour, irritability, impatience, frequent loss of temper, emotional volatility, egocentrism, impulsiveness, anxiety, depression, loss of social contact, lack of interests and reduced initiation are common after severe TBI and are often judged by family members, teachers, employers, friends and others to be the most problematic consequences of the injury (Weddell *et al.* 1980, Brown *et al.* 1981, McKinlay *et al.* 1981, Brooks and McKinlay 1983, Thomsen 1984, Lezak, 1986, 1987, Prigatano 1986, Brooks *et al.* 1987, Filley *et al.* 1987, Livingston and Brooks 1988, Petterson 1991, Jacobs 1993, Hall *et al.* 1994, Fletcher *et al.* 1995). In an early study, Thomsen (1974) found that 84% of family members surveyed complained of personality, behavioural and emotional changes in their loved one with TBI. During the subsequent 25 years, problematic social interaction after TBI has continued to be linked to difficulty maintaining employment, living independently and maintaining satisfying relation-ships with friends (Thomsen 1984, 1987, Klonoff *et al.* 1986, Prigatano 1986, Lezak 1987, Livingston and Brooks 1988, Bond 1990).

Possible contributors to ineffective social reintegration include pre-injury communication and behaviour problems, deficits tied directly to the injury, and a variety of possible post-injury outcomes, including psychoreactive phenomena related to growing failure and frustration, poorly selected coping and escape strategies, negative reactions to overly restrictive treatment settings and insufficient understanding and support from family and friends (Feeney and Ylvisaker 1995, 1997, Ylvisaker and Feeney 1998).

#### Preinjury contributors

We have already highlighted the frequency of pre-injury social and behavioural challenges in adolescents and young adults with significant social reintegration problems after TBI. These realities often have a two-fold effect on rehabilitation after the injury. First, old strategies and patterns of behaviour, however unsuccessful they were before the injury, may recur, often exaggerated by reduced self-regulatory capacity associated with frontal lobe injury. For example, many of the individuals with whom we work in rehabilitation have a pre-injury history of alcohol and drug abuse as well as problematic interactions with family and peers. Thus, facilitating social reintegration may necessitate addressing longstanding behavioural issues that stubbornly resisted pre-injury interventions. Second, negative attitudes towards teachers and other helping professionals before the injury often create a substantial obstacle to establishing positive working alliances with rehabilitation staff after the injury.

#### Injury-related contributors

Directly linked to the injury are the two classical frontolimbic behaviour syndromes (the so-called pseudopsychopathic and pseudodepressed personalities) as well as variations on these themes (Stuss and Benson 1986). Because frontolimbic circuits are the most vulnerable structures in closed head injury (Adams *et al.* 1980, Levin *et al.* 1991, Mendelsohn *et al.* 1992), behaviours associated with these patterns are commonly encountered in the population. The pseudopsychopathic personality, associated with orbitofrontal lesions, includes some combination of transient or persistent disinhibition, impulsiveness, lability, reduced anger control, aggressiveness, sexual acting out, perseveration and generally poor social judgement (Blumer and Benson 1975, Stuss and Benson 1986). The pseudodepressed personality, associated with dorsolateral or dorsomesial prefrontal lesions, is characterized by some combination of reduced initiation, apathy, lack of drive, loss of interest, lethargy, slowness, inattentiveness, reduced spontaneity, unconcern, lack of emotional reactivity, dullness, poor grooming and perseveration (Stuss and Benson 1986).

Indirectly linked to the injury are a variety of communication and behavioural challenges that may be secondary to cognitive impairment. Elsewhere in this issue, Godfrey and Schum described several possible effects of impaired supervisory attentional processes on conversational competence. In addition, impaired social perception and emotional modulation, which some investigators link to right hemisphere amygdala and frontal lobe lesions (Shammi and Stuss 1999, Stuss and Alexander, in press, also see McDonald, this issue), can interfere with social reintegration as the individual misinterprets the behaviour of others and responds accordingly. For example, good-natured teasing can be interpreted as an insult, resulting in a groundless altercation. Similarly, a friendly comment about appearance or about a personality trait can be interpreted as an invitation, with a sexual misadventure the unfortunate result.

In addition to these cognitive problems, virtually any sensory or motor deficit has the potential to negatively influence social interaction. For example, we currently work with a young adult who addresses peers in group sessions by standing up, positioning himself squarely in front of the peer, staring directly into the peer's eyes and often pointing at him. He uses these strategies to compensate for a combination of attentional, visual and balance problems. However, to unfamiliar communication partners, this posture appears aggressive and threatening, resulting in many unintended negative effects of his communication.

#### Evolution of post-injury symptoms

Many people with TBI enjoy a felicitous social reintegration, often resulting in part from their effort and natural resilience, and in part from the understanding and accommodations of everyday people in their social environment. However, members of the subpopulation under investigation in this article typically experience a downward social spiral, as social, academic and vocational failures create negative psychoreactive phenomena, which in turn exacerbate the challenges tied directly to the injury and intensify their social, academic and vocational failures. In our experience, this already vicious cycle may be worsened by restrictive treatment settings and interventions that appear meaningless or infantilizing to the person with TBI. Finally, social maladjustment may be further exacerbated by poorly selected escape strategies, such as abuse of alcohol and drugs. Ylvisaker and Feeney (1998) presented elaboration and illustrations of this theme.

#### A positive, everyday routine-based approach to intervention

#### Conceptual framework

Ylvisaker and Feeney (1998) described and illustrated an approach to intervention for individuals with chronic cognitive, communication and behavioural impairment after TBI that has as its core the concept of positive, supported, everyday routines of action and interaction. This framework is summarized in tables 1-4. Table 1 presents the general sequence of assessment and intervention activities, in which the traditional impairment-disability (reduced activity)-handicap (reduced participation) hierarchy is reversed (using these terms as defined by the World Health Organization, 1980, currently under revision, 1998). Historically, professionals working in medical rehabilitation have first attempted to reduce the underlying impairment with medication or exercises that target the neuropsychological breakdowns presumed to be responsible for the manifest disability. In the event of persisting impairment, intervention often turned next to attempts to reduce the functional disability by equipping the individual with compensatory procedures or by practising specific critical behaviours in the contexts in which they are needed. In the event of persisting disability, the focus often shifted to attempts to reduce the individual's handicap (i.e. reduced participation in social, educational and vocational activities) by modifying the environment and increasing the support provided by everyday people in the person's social, educational or vocational life.

In contrast, the intervention framework summarized in table 1 and in table 2 under the heading 'Contextualized functional intervention' first addresses handicap (i.e. the reduction in opportunities for meaningful participation in chosen life activities), by implementing supports and other modifications of everyday routines to increase the likelihood of successful participation. In most cases, the individual practises useful strategic behaviours as part of these supported everyday routines, thereby gradually reducing the disability (i.e. difficulty performing important tasks of everyday life) as strategic behaviour becomes routinized. Finally, in some cases, strategic behaviour comes over time to be internalized, thereby ultimately reducing to some degree the underlying impairment (i.e. the neurologically based processing difficulty). This is precisely the sequence and effect of everyday routine-based intervention in the case of Jason described later in this paper.

Table 2 outlines contrasting features of two importantly different approaches to rehabilitation for people with chronic cognitive, executive function, communication and behavioural impairment after TBI. It should be noted that there are many possible approaches to rehabilitation. What we refer to as the traditional and contextualized approaches embody central tendencies in frameworks that have different historical roots and sharply contrasting procedures.

In table 3 we outline components of a rationale for the contextualized, functional framework from the perspective of executive system, cognitive and behavioural impairment. Threats to social success associated with executive system impairment include weak decision making, disinhibition and reduced initiation. From a

Step 1.	Identify what is working and what is not working for the individual in everyday routines.
Step 2.	Identify what changes—including changes in the environment, in the behaviour of others and in the individual's own behaviour—hold the potential to change negative, unsuccessful routines into positive, successful routines and build repettoires of positive behaviour
Step 3.	Identify how those changes in everyday routines can become motivating for the individual and for critical everyday people in that environment.
Step 4.	Implement whatever supports are necessary for intensive practice of positive routines in real-world contexts.
Step 5.	Systematically withdraw supports and expand contexts as it becomes possible to do so.

Table 1. Progression of intervention within afunctional everyday approach to rehabilitation

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cognitive perspective, impaired working memory, weak strategic memory, disorganization and difficulty transferring all threaten social success. Possible behavioural contributors include difficulty learning from consequences and oppositional behaviour. In each case, we highlight the role of positive, supported, everyday routines in overcoming the obstacles. Readers interested in elaboration of these rehabilitation themes are invited to consult Ylvisaker and Feeney (1998).

# Dobermanns and behaviour: The need for antecedent focused behaviour management

Traditional operant applications of applied behaviour analysis, dating back to Skinner's early work (Skinner 1938), have explained behaviour as a consequence of both antecedents and consequences, but have placed the major burden on manipulation of consequences in teaching new behaviours or modifying undesirable behaviour. Furthermore, to the extent that antecedents are targeted in behaviour management, these have largely been the immediate antecedents (e.g. the trainer's commands, cues and prompts; environmental stressors at the time of the behaviour). Until recently, relatively little attention has been paid to remote events (e.g. an unpleasant interaction earlier in the day) or internal states of the individual (e.g. anger due to loss of friends; anxiety over lost skills; frustration associated with an unsatisfying job or no meaningful role in life) as potentially modifiable antecedents that increase or decrease the likelihood of certain behaviours.

Clinicians familiar with behavioural issues associated with frontal lobe im-

Traditional impairment-oriented intervention	Contextualized functional intervention
<i>Goal</i> : improvement of function, primarily by means of reduction of underlying impairment	<i>Goal</i> : success in life, achieved by whatever combination of impairment reduction treatments, disability reduction activities, and handicap reduction supports may be optimally effective in individual cases
Sequence of intervention: First, attempts to eliminate the impairment; second, attempts to reduce the associated disability with compensatory strategies (if the impairment persists); third, attempts to reduce the associated social handicap (if the functional disability persists)	Sequence: First, reduction of handicap with environmental and other supports in the context of everyday routines; second, reduction of associated disability with contextualized practice of compensatory procedures; third, possible reduction of underlying impairment with habituation and internalization of compensatory behaviour
Context: treatment setting using decontextualized training tasks	<i>Context</i> : everyday activities of life, possibly supported by counselling and exploration of potentially useful strategies in treatment settings
<i>Teaching procedures</i> : traditional behavioural training procedures	<i>Teaching procedures</i> : coaching/support/
<i>Transfer/Generalization</i> : transfer targeted (if at all) as a final stage of intervention	<i>Transfer/Generalization</i> : targeted from the earliest stages of intervention
Agents of rebabilitation: specialists in rehabilitation	Agents of rehabilitation: largely everyday people supported by specialists; both work collaboratively with the individual with disability
Measurement of outcome: performance on tests and training tasks in the treatment setting	Measurement of Outcome: degree of independence and success in real-world tasks; amount of support needed to be successful in real-world tasks; reduction in caregiver burden

Table 2. Traditional medically oriented intervention versus contextualized functional intervention for individuals with chronic social and behavioural impairment after TBI

pairment, whether congenital (e.g. ADHD) or acquired (e.g. TBI), often report a frustrating inefficiency in their clients' learning from consequences (Barkley 1987, Hallowell and Ratey 1994), often exacerbated by oppositionality, which grows in part in response to ineffective consequence-oriented management. This inefficiency has been documented in the frontal lobe research literature, which offers three potential explanations. Damasio and colleages (Damasio *et al.* 1991, Damasio 1994) have suggested that favourable or unfavourable consequences of behaviour can influence future behaviour only if *somatic markers*, or feeling states, are associated with the stored representation of the original behaviour. Their neuropsychological investigations indicate that ventromedial prefrontal cortex is critical to the laying down of somatic markers, explaining the inefficiency of consequence-oriented behaviour management in many people with closed head injury, given its high frequency of ventral prefrontal damage.

Rolls and colleagues (1994) highlighted impulsiveness, associated with orbitofrontal lesions, as a hypothesis capable of explaining maintenance of behaviours that have resulted in a history of seriously punishing consequences. Alderman (1996) concluded that weakness in the central executive component of working memory may explain the failure of many individuals with frontal lobe injury to

# Table 3. Rationale for an everyday, routine-based approach to intervention for individualswith TBI

From	the perspective of executive functions		
A.	Threat to social success: Difficulty making good decisions based on thoughtful consideration		
	of consequences and other relevant factors		
	<i>Possible solution</i> : Provide needed supports in everyday routines, stopping short of a degree		
B	Threat to social success: Reduced inhibition		
D.	<i>Possible solutions</i> : (1) Create everyday routines that include ample antecedent supports such		
	as positive setting events and avoidance of identified triggers; (2) Help the individual self- manage antecedents		
С.	Threat to social success: Reduced initiation		
	<i>Possible solution</i> : Create everyday routines that include initiation supports, such as initiation scripts, initiation cues (e.g. alarm watch), and peer support for initiation		
From	the perspective of cognition		
A.	Threat to social success: Impaired working memory		
	<i>Possible solutions</i> : (1) Practise positive everyday routines so that they come to be elicited by everyday environmental cues, obviating the need for complex thought processes; (2) Create prosthetic reminder systems (e.g. pager systems); (3) Create positive metaphors that package several pieces of information into one thought unit		
В.	<i>Threat to social success</i> : Impaired explicit and strategic memory; difficulty remembering past successes and failures		
	<i>Possible solution</i> : Proceduralize positive contextualized routines using implicit versus explicit memory processes, procedural versus declarative memory systems, and involuntary versus strategic or effortful learning tasks		
C.	Threat to social success: Reduced organizational skills		
	<i>Possible solution</i> : Create positive everyday routines that include external organizers, possibly including graphic advance organizers		
D.	Threat to social success : Difficulty transferring newly acquired skills from training to		
	application contexts <i>Possible solution</i> : Facilitate acquisition of social competencies in the context of everyday social interaction		
From	the perspective of behaviour management		
A.	Threat to social success: Inefficiency in learning from consequences		
	<i>Possible solution</i> : Build repertoires of positive behaviours using antecedent supports versus relying on consequences to shape positive behaviours		
В.	Threat to social success: Oppositional behaviour		
	<i>Possible solutions</i> : (1) As much as possible, work within the individual's world of meaning and personal goals; (2) Tie interventions to positive personal metaphors or life narratives		
respo	ond to traditional operant training techniques, including reinforcement,		
extin	ction and time-out intervention. In individual cases, it may be a combination		
or th	lese three phenomena that explain the inemciency of traditional behaviour		
mana	agement. For our purposes, the research literature at least directs clinicians to		
In	the 1990s, momentum has grown within the field of applied behaviour		
analysis favouring an approach to teaching and supporting individuals with			
chall	enging behaviour that places greatest emphasis on manipulation of ante-		
ceder	nts, including immediate and remote as well as observable and unobservable edents. Although most of the research and clinical discussions address		

antecedents. Although most of the research and clinical discussions address behavioural issues associated with developmental disabilities, application of antecedent technologies has entered the experimental and clinical literatures in TBI rehabilitation (Feeney and Ylvisaker 1995, 1997, Ylvisaker and Feeney 1996, 1998). Carr and colleagues (1998) refer to the traditional and highly restricted use of

#### Table 4. Behaviour management via control of antecedents: Alternative approaches

Molecular approach to antecedent control: the tradition in applied behaviour analysis *Antecedents*: Discrete measurable stimuli that precede a behaviour and increase or decrease its likelihood of occurrence (e.g. a specific instruction, cue, warning, promise)

Assessment: To identify these antecedents for purposes of control (a-b-c analysis, including active experimentation with antecedents), often in controlled settings (i.e. analogue assessment)

*Intervention*: To increase or decrease specific behaviours by manipulating the specific immediate antecedents related to the behaviour (e.g. eliminate triggers, modify antecedents, fade antecedents in or out)

#### Molar approach to antecedent control: Late 1990s

Antecedents: Broad, potentially continuous, often hard-to-measure variables that may increase or decrease the likelihood of occurrence of positive or negative behaviour

- internal states (e.g. illness)
- living arrangements
- social relationships
- education (e.g. placement, demands, level of success)
- work (e.g. placement, demands, levels of success, perceived meaningfulness)
- leisure (frequency and quality of enjoyable activities)
- the relation between the person's needs, competencies, and environmental demands
- self-perception, including implicit metaphors that guide thinking and behaviour

Assessment:

- To identify the background antecedents or nonimmediate 'setting events' that may be related to positive or negative behaviours, generally in natural settings
- To assess the 'goodness of fit' between the person's needs, competencies and social, educational and vocational demands

#### Intervention:

*Primary purpose*: To influence major background setting events and conditions with the goal of helping the individual to create a satisfying lifestyle

 may be most efficiently met by educating and training everyday communication partners and in other ways creating a 'best fit' between the individual and his or her living, work, social and/or educational environments and activities

Secondary purpose: To indirectly increase desirable and decrease undesirable behaviours

(Based on Carr et al. 1998.)

antecedents as a *molecular* approach to behaviour management and the broader approach as a *molar* approach. These approaches, summarized in table 4, include many components that we would consider intervention from an executive system perspective. Clinicians capable of professional code switching often discover intervention parallels such as this in unexpected places.

Professionals trained in traditional behaviour management may be surprised to see goals such as the following in a behaviour plan for a person with challenging behaviour: 'John will increase the frequency of self-selected activities during his programme day.' 'John will increase the amount of time he spends with peers with whom he shares meaningful interests.' 'John will increase the amount of time he spends engaged in work that he describes as meaningful.' However, the revolution in behavioural psychology that has gained momentum during the 1990s recommends just such a focus in managing behaviour and facilitating acquisition of positive social skills, particularly for the oppositional Dobermanns of the world.

Setting events are potentially remote occurrences or conditions that increase or decrease the likelihood of a behaviour and determine whether a specific behavioural intervention will be effective (Baer *et al.* 1987). Because the concept of setting event is unfamiliar to some rehabilitation specialists and bears meaning that is not

#### Table 5. Categories and examples of setting events that potentially influence behaviour

#### Internal states of the individual

#### Neurologic states

Positive setting events: normal neurology

*Negative setting events*: overactivity of the limbic regions; seizures; neurotransmitter disruption; decreased cerebral blood flow

#### Other physiologic states

*Positive setting events*: rest, relaxation, satiation, appropriate levels of medication *Negative setting events*: pain, illness, hunger, over medication, under medication, motor deficits, sensory deficits

#### Cognitive states

*Positive setting events*: orientation to task, familiarity with routine, adequate recall of relevant events, adequate recognition of things and people

Negative setting events: confusion, disorientation, frustration, inadequate recall and recognition Emotional states

# *Positive setting events*: sense of accomplishment, success, achievement, acceptance by others, respect from others, meaningful role, sense of self consistent with life circumstances *Negative setting events*: anxiety, anger, depression, sense of loss and failure

#### Perception of task meaningfulness and difficulty

Positive setting events: belief that assigned tasks are meaningful and can be accomplished Negative setting events: belief that assigned tasks are meaningless, infantilizing or impossible

#### External events and conditions

#### Living arrangement

*Positive setting events*: living in a self-selected environment without excessive restrictions *Negative setting events*: living in an excessively restrictive setting; living at home with parents after having lived independently

Presence or absence of specific people

*Positive setting events*: presence of preferred people, reciprocal friendships *Negative setting events*: absence of preferred people, loss of friends, presence of nonpreferred people

#### Recent history of interaction

Positive setting events: recent positive and pleasurable interactions

Negative setting events: recent conflict or disrespectful interaction

#### Other environmental stressors

*Positive setting events*: appropriate and desirable environmental stimulation *Negative setting events*: irritating environmental stimulation (e.g. ambient noise, improper lighting, other distractors)

#### Time of day

*Positive setting events*: alertness, best time of day relative to the individual's natural cycles *Negative setting events*: bad time of day relative to the individual's natural cycles

Reproduced with permission from Ylvisaker and Feeney (1998).

transparent (e.g. 'event' is not restricted to temporally discrete occurrences, but can include internal states and conditions), we include in table 5 a list of positive and negative setting events that can be used as a checklist in working with individuals with difficult behaviour after TBI.

Attention to setting events is a decidedly molar approach to intervention and is particularly critical in working with people with acquired brain injury because of the cumulative negative effect on behaviour of chronic discomfort, restrictions on activities and choices, limited control over major life events, frequent changes in living situation and routines and, perhaps most critically, failure to achieve goals consistent with pre-injury expectations and aspirations. A background of negative setting events lowers behavioural thresholds that may already be low as a result of the injury. Conversely, a background of positive setting events elevates those thresholds and increases the likelihood that the individual will become productively engaged in difficult tasks. The developmental disabilities behavioural literature is rich in reports of experiments demonstrating the positive effects on behaviour of inducing positive setting events, including creating positive behavioural momentum before introducing difficult tasks (Mace *et al.* 1988, 1990, Kennedy *et al.* 1995, Fowler 1996, Carr *et al.* 1997, Mace *et al.* 1997) and offering choice and control (Bannerman *et al.* 1990, Brown *et al.* 1993, Harchik *et al.* 1993, Dunlap *et al.* 1994).

#### Motivation, mentation, and metaphor

We began this article with metaphors designed to capture central tendencies in the population of adolescents and young adults with chronic social integration problems after TBI (e.g. the 'Dobermanns' of this world) and also important insights about professional practice (e.g. cautions against 'Binkification'). In our work with difficult-to-serve individuals, we often assign to metaphors and associated narratives the more important task of helping people to guide themselves through potentially complex social and cognitive territory and to create motivation for changes in behaviour that may initially appear unappealing or even threatening. To help people with TBI organize their thinking and direct their actions, it is often helpful to bring together a potentially complex set of thoughts, procedures or behaviours as one compelling image or metaphor that at the same time serves as a beacon of incentive and as a compensation for cognitive impairment.

For example, the concept of executive functions is itself a metaphor that organizes a large quantity of complex conceptual material. For most young people with TBI, the executive metaphor holds little personal significance and fails to yield a compelling vision of the goal of rehabilitation. However, those adolescents and young adults who played team sports before their injury may be able to comprehend executive function themes using the alternative metaphor of a self-coach and at the same time give themselves a compelling vision of a successful, self-directed life after the injury (Ylvisaker and Holland 1985). We have worked with many adolescents and young adults with TBI for whom self-control was a wholly unappealing goal until they connected self-controlled behaviour with an image of their favourite coach (or other valued person who represented strength and selfcontrol) and placed that image in their head as the cue and motivator for their attempts at self-regulation.

#### Motivational dimensions of metaphor

It should come as no surprise that metaphors and related images can play a powerful role in motivating people to behave in ways that might otherwise be difficult or unappealing. Throughout history, people have killed and been killed, driven by powerful images, symbols, narratives and metaphors. Depending on one's culture, convictions and experiences, symbols such as a national flag, a cross or a swastika elicit powerful emotions and drive people to extreme actions. The motivational power of metaphor is particularly important for individuals whose injury has resulted in inefficient learning from consequences. Furthermore, if the guiding metaphor is associated with a personal hero, it is ideally suited for adolescents and others whose development may have been arrested in adolescence, given the power of heroes and role models in shaping adolescent identity and motivating their behaviour (Conger 1984, Czikszentmilhalyi and Larson 1984).

The view that metaphors—explicit or implicit in the language we use—control much human thinking, emotions and behaviour has a long and noble tradition in philosophy and linguistics. Lakoff and Johnson (1980) illustrated this thesis with a conceptual and linguistic analysis of several apparently nonmetaphorical terms in English. Recently, these authors connected their theory of metaphor with contemporary themes in the cognitive sciences and cognitive neurosciences (Lakoff and Johnson 1998). Their compelling view is that emotions and actions are shaped by many tacit metaphors operating below the level of conscious awareness, in part because such metaphors function in cognitive processing as knowledge structures described by cognitive scientists.

The metaphors, images and symbols associated with disability and rehabilitation are often unappealing for adolescents and young adults with TBI. For example, 'patient', 'treatment', 'clinic' and other medical terms carry with them the suggestion of powerlessness, passivity and illness. More directly related to the theme of this article, many people with whom we work understand the term 'socially appropriate behaviour' to include (a) what authority figures want me to do, (b) behaviour that is inconsistent with my sense of self, and (c) weakness. Thus, metaphors operating beneath the surface of langauge may turn the process of social rehabilitation into undesirable binkification. In contrast, we have emphasized the motivational attraction of metaphors like 'strong, self-controlled Dobermann' for many young people with TBI.

Helping individuals to identify metaphors that work for them requires flexible and highly individualized exploration. For example, we once worked with a fiercely oppositional adolescent who had been in serious trouble with the law and who had threatened several staff members in his residential programme. We broke through his oppositionality by hiring him as a consultant to develop a training video about oppositionality. In his capacity as a paid consultant, he revealed that his overriding goal in interacting with authority figures and many peers was to avoid being a suck up' (his term). The only 'nonsuck-up' role with which he was familiar was that of a fiercely oppositional and defiant bulldog, which he played effectively (and which routinely got him into serious trouble). We agreed to refer to this role with a vulgar metaphor (to cast it in a negative light) and offered a third way of acting, that of 'winners'-successful people who are not suck ups, but who do what needs to be done to achieve their goals. He then agreed to practise negotiating many everyday social interactions in three ways: as a suck up, as his traditional defiant self and as a winner. We videotaped these interactions (as part of developing the training programme), which he reviewed as part of his responsibilities as a consultant to the project.

During this contextualized practice, his social skills coach (a speech-language pathology intern) mediated his experience with discussion of which of these three interactive styles were comfortable for him (the suck-up style was never comfortable) and which were successful (the defiant style was never successful). Success and adequate comfort came to be associated with a wide range of positive ('winner') interactive behaviours. Social cues could then be reduced to one positive reminder—'You can be a winner'—as opposed to the top-down admonitions that he had routinely interpreted as nagging and to which he had routinely reacted with oppositional behaviour. Perhaps more importantly, success came to be associated with a conviction that 'winner behaviour' was his route to freedom, a good job and other personally significant goals. This metaphorical transformation at least brought him onto the playing field of successful social interaction, which he continued to practise with considerable success.

#### Cognitive dimensions of metaphor

Working memory limitations are commonly associated with frontal lobe injury. When people are unable to hold several thoughts or procedures in mind at one time, it is useful to pack a great deal of information into one metaphorical thought unit. For example, if a person wants to talk like Michael Jordan, then 'Mike talk' can come—with practice—to include several dimensions of speech and language that would otherwise vastly exceed the individual's working memory capacity.

Years ago we worked with an adult with frontal lobe injury and debilitating executive function impairment (Ylvisaker *et al.* 1987). The metaphor of executive functions meant little to him and, to the extent that he understood the concept, it was far too complex to play a functional role in his daily behaviour. However, when we switched from 'executive' functions to 'coaching' and 'self-coaching' functions—and when he made the metaphor even more concrete by giving these functions the name of his favourite football coach ('Foge' Fazio, then coach of the local University football team)—he was able to pack a great deal of self-regulatory meaning into one image, an image that he increasingly called on to guide himself through otherwise unmanageable interactions. In one compelling unit of thought, *Foge* came to mean, 'What am I trying to accomplish? What's my plan? How am I doing? Do I need to try something else—or perhaps temporarily leave the playing field and prepare a new play?'

The following four metaphors illustrate the use of individualized motivating metaphors in brain injury rehabilitation:

1. Social skills as basketball plays: A former basketball player whose impulsiveness had led to substance abuse and serious trouble with the authorities came to agree that he needed 'to be like Mike [Michael Jordan] and use set plays rather than running around the court like a crazy kid.' Social skills training then became a process of defining successful plays, putting them in his play book and videotaping him engaged in these plays so that he could review the game films as part of routinizing the plays. Social cues for this extremely disinhibited person were then reduced to the nonthreatening 'What's the play?' and 'Is this play in the play book?' as opposed to the cues (i.e. nagging) that staff had previously used and that had routinely elicited oppositional behaviour.

2. Requests for clarification as journalistic behaviour: A well educated young woman with a commitment to feminism before her injury overcame her reluctance to asking communication partners for clarification of their message once she associated these requests for clarification with the journalistic practices of her heroine, the well known feminist and journalist Gloria Steinem.

3. Cognitive prostheses as common work place practices: A young man who before his injury had been a truck driver at a gravel pit overcame his resistance to compensatory procedures, such as a small memory notebook, when he connected these strategies with the common practice at his former job site of having unused trucks and drivers available for emergency purposes if the others broke down.

4. *Risk-taking behaviour as red-card violations in soccer*: A former soccer player, who had been arrested twice on drug charges after his injury, began to work hard on his recovery after formulating the following metaphorical insight, 'I want to play the game, but I have a yellow card. The next time, it's a red card and I'm off the field. But my teammates will still be playing—and playing at a disadvantage because I got myself thrown out of the game. I can play and enjoy playing and win, but I've got to pay attention to the rules.'

#### Comprehension of metaphor and abstract thought

Cognitive processes underlying the comprehension and expression of metaphors are often grouped with other types of nonliteral processing (e.g. processing of idioms, figures of speech, proverbs) as presupposing a relatively high level of abstract thought, thus presumably making them unavailable to young children and others who, like young children, are concrete thinkers. Because many people with TBI are said to be concrete in their thinking, with difficulty comprehending indirect dimensions of meaning (Dennis and Barnes 1990, this issue), it would seem to follow that extensive use of metaphor in social rehabilitation would be out of the question.

Fortunately, efforts to demonstrate substantial cognitive prerequisites for metaphoric comprehension have failed (Billow 1975). To be sure, comprehension of metaphor improves with age during childhood and adolescence. However, even preschoolers have been found to process some metaphors accurately (Gardner 1974, Pearson 1990)—including psychological metaphors (e.g. happy is orange, sad is blue)—particularly when the metaphors use a familiar and concrete vocabulary and involve themes that are familiar and meaningfully tied to the child's knowledge and experiences (Nippold 1998). Furthermore, narrative contexts are known to facilitate young children's comprehension of metaphor (Waggoner *et al.* 1985), which supports the practice of embedding motivating metaphors within the context of a compelling life narrative for individuals with TBI.

Our experience with many individuals with cognitive impairment after TBI is that comprehension of metaphors that are specifically tied to their pretrauma experiences and values is perhaps easier than comprehension of the same content presented without metaphorical support Indeed, some of the young men who had acquired the colourful metaphorical language of the streets and prisons before their injury communicate largely with well rehearsed metaphors and figures of speech. Often a goal of language therapy is to help them communicate more effectively by making greater use of literal language, helping them understand literal meaning by associating it with a well understood metaphor or figure of speech. That is, in this case, metaphor offers concrete meaning as a basis for literal understanding a reversal of the traditional relationship.

#### Case illustration

#### The social reconstruction of identity

Jason described a life of increasing failure and despair after a severe injury, with primary prefrontal focus, at age 24 (Lewin 1998). Prior to his injury, he had been an above-average student who had completed three years of his undergraduate programme in industrial design. He was a hard worker who often had two jobs to support himself and maintain a rich array of activities. However, he also had a history of oppositional behaviour, having been expelled from two universities for combative behaviour and having withdrawn from a third as a result of a conflict with the Chair of his major department. He then joined the Marines, but was discharged as a result of his commanding officer's concern that he was insufficiently compliant to behave as commanded under battle conditions. He had a history of conflicts with family members and peers, but also had several friends and was engaged to be married at the time of his injury. Judged by objective indices and by his own admission, Jason was a Dobermann before his injury, which occurred when the motorcycle he was riding was hit by a car. Oppositional and defiant behaviour increased dramatically over the first four years post-injury.

Jason received acute medical and rehabilitation services for three months, at which time he discharged himself against medical advice. The next three months of community living included a marriage and divorce, and growing anxiety that culminated in the first of his three psychiatric hospitalizations. After two months, he was discharged to home. He attempted to return to work and school, but experienced increasing anger, stress, conflict and explosive behaviour. These difficulties were exacerbated by his use of illegal drugs. Finally he was jailed briefly for threatening a motorist with a gun. Following a two-week release to home, he was returned to jail for an altercation with his brother, again involving a firearm, and a subsequent suicide attempt.

As an alternative to jail, he was sentenced to a neurobehavioural TBI rehabilitation programme where his defiant behaviour continued to escalate. After three months, he was removed from the facility by local police for attacking a staff person and was returned to jail. A three-month incarceration was followed by another admission to a psychiatric hospital, where he attacked a nurse, which resulted in his return to jail. Following another brief and unsuccessful attempt at community living (in his mother's home), he was again admitted to a psychiatric hospital. We began to work with Jason as he attempted to establish community living following this final five-month psychiatric hospitalization. He was almost four years post-injury, his anxiety and violent behaviour had escalated over this period of time and medical personnd who knew him offered an extremely pessimistic prognosis for successful community living.

In contrast to these gloomy predictions, Jason has enjoyed a life of increasing self-control and personal satisfaction over the four years since his final discharge. He has completed his bachelor's degree, has worked with us in delivering many workshops to rehabilitation professionals in New York state, works as a peer counsellor in a TBI-substance abuse programme, and has established a stable relationship with a woman to whom he was recently married. Most importantly, he perceives himself to be in control of his life and his behaviour, and sees his life unfolding in a way that is consistent with his understanding of who he is. From a communication perspective, unpleasant interactions no longer evolve into shouting matches or physical conflict, as was often the case when his life was out of control. Table 6 summarizes Jason's judgements about the interventions that worked for him, as well as those that did not work and in many cases worsened his condition. Ylvisaker and Feeney (1996) and Lewin (1998) provide elaboration of these intervention themes.

# Table 6. Jason's reflections on social and behavioural rehabilitation: Effective and ineffective interventions

Ineffective interventions

- Restrictive settings (e.g. jails, psychiatric hospitals, neurobehavioural TBI facilities) Jason's response: opposition to the restrictions
- Unreasonable restrictions in restrictive settings Jason's response: opposition to the restrictions and loss of respect for staff
- Training in domains of behaviour unrelated to personal goals *Jason's response*: increased agitation
- Biofeedback treatment
  - Jason's response: increased anxiety and agitation
- Attempts to shape behaviour with personally meaningless rewards and punishments
- Jason's response: anger and total loss of respect for staff
- External control Jason's response: aggressive attempts to increase his control

Effective interventions

- Maximum possible choice and control
- Well defined networks of support, specifying the source of help under specific conditions
- Use of external executive system supports, including a numerical 'barometer' for selfmonitoring levels of agitation, with concrete preventive rules related to specific levels on the barometer (a system that has evolved over past the four years)
- Prevention of uncontrolled behaviour by self-management of antecedents, including building positive setting events before attempting stressful tasks
- Prevention of uncontrolled behaviour by advance scripting of behaviour for potentially difficult interactions
- Nonthreatening reality checks
- · Personally meaningful activities, including opportunities to help others
- Acceptance of responsibility, associated with feelings of control
- Motivating images and metaphors
- Conservatively prescribed medications (e.g. antidepressants, anti-anxiety agents)

# Contextualized, everyday routine-based intervention

In table 2, we outlined the components of a contextualized and functional approach to intervention based on modification of everyday routines of life. Table 7 illustrates the major themes of this approach as they apply to Jason's successful social rehabilitation.

# Jason's guiding metaphors

Four years ago, as Jason prepared to begin community life after what has turned out to be his last psychiatric hospitalization, we engaged him in the process of producing a transitional, self-advocacy videotape (protocol presented in Ylvisaker, Szekeres, and Feeney 1998). For Jason, the primary purpose of the video was to screen out potential community support staff who would inevitably raise his agitation levels and cause more harm than good. To this end, he presented himself in a rather frightening way on the video.

However, the video served other purposes as well. From our perspective, it was a vehicle for Jason to organize his thoughts about himself, including his strengths, the difficulties that had created a nightmare life for him for four years, and his view of what help looks like. After he made the video, he watched it several times and derived from these viewings a critical insight. To be successful by his own standards, he realized that he needed to be like Clint Eastwood, who, like Jason,

# Table 7. Components of Jason's intervention as an illustration of a collaborative, contextualized, everyday routine-based approach

### Goal of intervention

All intervention activities were oriented around Jason's general goal (to achieve successful community living free of excessive external control) and specific goals (e.g. to complete his education, establish effective relationships with family and friends, maintain meaningful employment).

## Sequence of intervention

(1) *Reduction of social handicap* was first achieved by working with Jason to create executive system supports (e.g. his barometer system) and with the members of his everyday support system (e.g. family, friends, case manager, behavioural support staff, employer) so that Jason had the external support he needed to successfully use his strategies and supports.

(2) *Reduction of disability*: Over the course of several months, the support of a behavioural aide was gradually withdrawn as Jason became more comfortable with his ability to use his strategies, manipulate his own supports as he needed them, and direct his own behaviour using rules that he had fashioned for himself with the help of a rehabilitation specialist. For example, he used a customized emergency 911 system when he sensed a growth in anxiety or agitation that he would not be able to control.

(3) *Reduction of impairment*: Jason has successfully used his self-regulatory strategies for four years in the context of his everyday routines. He now reports that these strategies are almost automatic for him, yielding executive, self-regulatory functioning superior, in his judgement, to that which characterized his preinjury life.

# Context of intervention

Since leaving his last psychiatric hospital, all of Jason's interaction with rehabilitation specialists (with the exception of neuropharmacological evaluations) have taken place in community settings (e.g. in his home, over breakfast in a restaurant) and have used his real-life activities, concerns and interactions as the material for brainstorming about strategies, scripts, supports and other intervention themes.

# Teaching procedures

Rehabilitation specialists have presented themselves to Jason as consultants (versus trainers, treaters or controllers), helping him overcome real-world obstacles to his personal goals. Teaching procedures have largely been contextualized coaching and apprenticeship procedures, as opposed to traditional behavioural training procedures (Ylvisaker and Feeney 1998).

# Transfer/Generalization

Because interventions were created for and implemented within the routines of Jason's life, transfer has not been a major concern. However, as he became increasingly successful using strategies in the specific contexts for which they were created (e.g. specific interaction scripts for use with specific communication partners), Jason has spontaneously expanded the use of successful procedures (e.g. independently preparing scripts for interactions that he anticipates will be stressful).

# Agents of rehabilitation

Specialists in rehabilitation have played an important, but largely a background role in Jason's successful social rehabilitation. Specialists worked collaboratively with Jason in creating strategies and support systems, and in orienting everyday people in Jason's life to their role within these systems. In addition, specialists have been available for ad hoc problem solving. Jason himself has been empowered to be a critical agent of his own rehabilitation, as have members of his family, his fiancée (subsequently his wife), and other everyday people.

# Measure of outcome

There exists no office-bound testing procedure that could possibly capture the success of Jason's rehabilitation. From a financial perspective, his cost to the state medicaid and penal systems during the year preceding our initiating contextualized intervention was approximately \$125,000. This cost was reduced to about \$20,000 during year one of contextualized intervention, about \$10,000 during years two and three, and about \$2000 in year four. The physical and emotional burden on family and friends has been dramatically reduced. Most importantly, Jason reports that he has his life back.

is a tough guy, but also a highly successful tough guy who is at the same time an actor and a director who directs himself as well as others. As a person with executive system impairment, Jason came to associate this compelling Clint Eastwood metaphor with all of the effortful self-regulatory behaviours that would now be required of him if he wished to be successful in community life. The insight did not reduce the effort, but it made that effort appealing (because it was associated with the Clint Eastwood metaphor) and organized a great deal of procedural detail (i.e. his deliberate executive system behaviours, see table 6) into one coherent, compelling image. In addition, it reminded him that it is acceptable to be directed by others while at the same time being able to give direction to others.

The Clint Eastwood metaphor helped Jason succeed during the early difficult months of community living. However, the metaphor was insufficient to guide ongoing life and the many stages of increasing self-regulation that were to follow. For that purpose, Jason created a flexible metaphor: He chose to see himself moving up the ranks in the Marine Corps. For Jason, marines are powerful people who take risks, but only after they have assessed the nature of the risks; they are prepared for a range of possibilities; they are willing and able to fight tenaciously for what they perceive as right; they play hard and are respectful. When we last spoke with Jason about this metaphor, he reported that he has made it to the rank of captain in his head. Among other benefits, the Marine metaphor allows Jason to retain a sense of strength without resorting to 'grunt-like' behaviour and to turn confrontational work over to others (as Marine officers have others do much of their difficult work), without thereby seeing himself as weak or incapable.

In addition to these two guiding personal metaphors, Jason uses a *dust storm* metaphor for self-control when 'things are going haywire'. When the wind blows dust into the air, it is critical to let it settle before attempting to clean up the mess and move on. Jason calls on this metaphor to remind himself that he can deal with only one stressor at a time, and that he must fight his tendency to fix things as soon as possible—thereby adding to his stress. Rather, letting the dust settle calls for patience and economy of effort.

The contrasts in Jason's life over the past eight years since his injury are remarkable. During the first four years, his life was punctuated by countless uncontrolled conflicts resulting in loss of friends and many incarcerations in jails or locked psychiatric units. With well designed executive system routines in place, guided and supported by appealing metaphors, Jason has had no major conflicts in his life during the succeeding four years and reports a level of satisfying selfregulation superior even to his life prior to his frontal lobe injury.

#### Effectiveness of intervention

The rehabilitation themes expressed in this article are based in part on our clinical experience with several hundred children, adolescents and young adults in a variety of medical and community settings. We have attempted to validate the clinical procedures through the presentation of a large number of single-subject experiments and case studies (Ylvisaker and Feeney 1994, 1995, 1998, Feeney and Ylvisaker 1995, 1997, Ylvisaker *et al.* 1998, Ylvisaker *et al.* 1999). For example, Feeney and Ylvisaker (1995) presented three changing-treatment single-subject experiments involving adolescents with frontal lobe injury associated with growing academic, social and behavioural disability over the first several years after their



Figure 1. Frequency of aggressive behaviours during A-B-C-A conditions: Jim. Reproduced with permission from Feeney and Ylvisaker 1995.

injury. In each case, a reduction in frequency and intensity of challenging behaviour, together with an increase in quantity of work completed, was associated with the intervention. Figures 1, 2 and 3 present data for one of these subjects, Jim, who had been expelled from his high school and who averaged 30 to 35 incidents of verbal or physical aggression per day in his alternative vocational training placement prior to the intervention.

The intervention for these three subjects combined several of the clinical themes described in this paper: (a) Context: Services and supports were delivered entirely in the adolescents' academic or vocational training setting, using tasks and routines natural to those settings. (b) Negotiation and choice: In each case, the changes in everyday routines were negotiated with the subjects and were implemented only with their approval. (c) Positive setting events: Among the changes that were made in the daily routines was an attempt to ensure that the subjects experienced an adequate amount of success before difficult or stressful tasks were introduced (i.e. positive behavioural momentum). (d) Communication alternatives and communication partners: Communication partners, especially instructional assistants, were taught to respond positively to the subjects' initial nonaggressive attempts to communicate their need to escape stressful tasks or negative situations. (e) Cognitive supports: Each subject began with a photograph organizer to help him stay organized with large or complex tasks (intervention at phase B). Following mastery with this level of support, a written advance organizer was substituted for the photographs for most tasks (intervention at phase C). With these changes in everyday routines, aggressive forms of communication were nearly eliminated in each case (figure 1), with a corresponding reduction in intensity of negative behaviours (figure 2) and an increase in work completed (figure 3). Furthermore, long-term follow-up demonstrated that each subject had achieved a satisfactory



Figure 2. Mean ratings on disruptive elements of the Aberrant Behaviour Checklist during A-B-C-A conditions: Jim. Reproduced with permission from Feeney and Ylvisaker 1995.



Figure 3. Mean percentage of work completed during A-B-C-A conditions: Jim. Reproduced with permission from Feeney and Ylvisaker 1995.

post-secondary school life. For example, Jim received his high-school diploma and, at first follow-up, was maintaining full-time employment. At second follow-up, he was successfully enrolled as a full-time university student.

Additional empirical support for contextualized and proactive procedures like those described in this article can be found in reports of experimental work with other, more thoroughly studied disability populations. Elsewhere we have attempted to summarize much of this work and demonstrate its relevance to TBI rehabilitation (Ylvisaker and Feeney 1998). For example, the population of adolescents with ADHD and associated behavioural impairment is similar in important ways to the population under examination in this article with respect to presenting symptoms and underlying frontal lobe pathology. Similarly, contextualized cognitive behaviour modification (CBM) is similar in theory and practice to the approach to intervention that we have described. A recent metaanalysis of 23 studies of the effectiveness of contextualized CBM for adolescents with ADHD found very strong evidence for its efficacy in reducing hyperactivity/ impulsiveness and aggression, and for the durability of the treatment effects over time (Robinson *et al.* 1999).

The cost effectiveness of the contextualized, everyday routine-based, personcentred approach to rehabilitation that we have described is supported by financial analysis of the community-based behavioural support programme for young adults with TBI, referred to earlier in this paper. During fiscal year 1996–97, the programme cost \$144,000 and resulted in savings of \$1,486,000 (based on conservative calculations by external New York State Health Department auditors). During that year, 92 Health Department clients were served, either directly by us or indirectly through an apprenticeship programme wherein project specialists train and support community professionals throughout the state.

Finally, there is negative evidence that indirectly supports a richly contextualized approach to serving individuals with chronic executive system, cognitive, behavioural and social skill impairment after TBI. Decontextualized, exercise-based cognitive training and retraining methods have been shown to be disappointing in their results with people with no disability (Singley and Anderson 1989), with learning and developmental disabilities (Mann 1979, Kavale and Mattson 1983), and with TBI (Carney *et al.* 1999). Similarly, reviews of decontextualized, role-play-based social skills training programmes have shown little success at the level of generalization and maintenance for several disability populations (McIntosh *et al.* 1991, Zaragoza *et al.* 1991, Weiner and Harris 1998).

#### Summary

We have described and illustrated an approach to social rehabilitation for adolescents and young adults with disability in domains of everyday social interaction in which executive function, cognitive, communication and behavioural deficits interact to create potentially insurmountable barriers to achieving a satisfying life. The approach progresses from identification of functional breakdowns in everyday routines, to identification of ways in which those routines could be improved (e.g. strategic behaviours, external supports, modification of the behaviour of others), to supported practice with those strategies or modifications in place, and finally to systematically reducing external supports as the individual's performance improves. In our experience, it is often relatively easy to identify ways in which everyday routines can change for the better. Far more problematic and frustrating is the search for sufficient motivation to embrace those changes and practise more positive ways of interacting with others.

Our discussion of personally meaningful metaphors was intended to serve as a partial solution to this chronic motivational problem. A powerful metaphor is much like a ripe pod of seeds. When tapped ever so lightly, the pod bursts open, sewing hundreds of seeds. If the soil is appropriate and the conditions nurturing one pod may ultimately give birth to a forest of strong, healthy plants. If the soil is not appropriate or the conditions hostile, none of the seeds takes root. And so it is with the ecology of guiding metaphors, which must be thoughtfully selected, planted in receptive soil and nurtured so that their meaning might illuminate and compel positive changes in a life otherwise resistant to change. Jason's personal narrative and the metaphors that continue to create meaning for him as the lead character in that narrative stand as testimony to the strength of these ideas.

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