Developing behavioural training services to meet defined standards within an Australian statewide disability service system and the associated client outcomes*

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Abstract
Background  LaVigna, Christian, and Willis (2005) reported on a project where Institute for Applied Behaviour Analysis (IABA) staff trained a professional team in New Zealand (NZ) to provide behavioural services that met defined criteria. The NZ team was then trained to train other practitioners to meet the same professional standards. However, no client outcomes were reported in that study.
Method  This study replicates the NZ study within disability services in Tasmania, Australia. Further, this study examined the associated client outcomes and the impact of the training on severity ratings of subsequent referrals.
Results  Tasmanian trainers trained participants to provide behavioural services that met the same professional standards. Client behavioural outcome data showed significant improvement. Referral data showed decreases in severity ratings.
Conclusions  The trainer of trainers process is effective in training staff to meet defined professional standards, including desired client outcomes, and to effectively make positive behaviour support accessible to a large number of people.

Keywords: challenging, behaviour, training, disability, episodic severity

Introduction
The Tasmanian Disability Services Act (1992) requires that services to people with disability are based on an approach that is nonaversive and utilises the least restrictive alternatives in treatment or support options. Delivering effective, efficient, and sustainable services within this framework for people with disability and challenging behaviour presents difficulties to many service jurisdictions. One of the challenges for the Tasmanian disability service sector has been meeting the needs of those individuals whose behaviour is putting themselves and/or others at risk.

The key issues for Tasmania in identifying appropriate service development initiatives were to invest in programs that had a demonstrated evidence base and would meet the needs of individuals with a disability who presented with severe and challenging behaviours that posed a significant risk to themselves and/or others. One of the key challenges to the sector was the development of service models that were affordable, financially sustainable, and consistent with the aforementioned legislative framework, with particular focus given to the principles requiring that both nonaversive and least restrictive options be utilised to meet the needs of people with disability.

Functional analysis and positive behaviour support (PBS) are discussed extensively in the literature as a basis for intervention with individuals who present with problem behaviours. Indeed, functional communication training is reported by Durand and Carr (1991) as an alternative to noncontingent physical and chemical restraint for crisis management and contingent aversive treatment strategies. They reported decreases in challenging behaviour, which were maintained over 3 years.
LaVigna and Willis (1995, 2005a) describe a model for conducting comprehensive functional analysis and developing multi-element treatment planning that is effective in dealing with challenging behaviour such that a person’s quality of life may be improved; not least of all by increasing social and community inclusion. This model of support incorporates functional communication training and a robust approach to individual outcome measurement.

The multi-element model consists of four elements: three proactive elements designed to change behaviour over time (i.e., to reduce occurrence), and one reactive element for responding to crisis. The proactive elements include ecological, positive programming, and focused support strategies. Ecological strategies are designed to smooth the fit between the person’s needs and their environment. These strategies may include changes to physical environments, such as reducing noise and crowding, changes to interpersonal environments, for example, tone of voice, selecting staff of a particular gender or who have particular interests in common with the client, and changes to the programmatic environment, which could include matching task difficulty to the person’s ability and making the environment more predictable through the use of visual schedules. Positive programming strategies include teaching functionally equivalent skills, so that the person is able to communicate their needs more appropriately or to meet their needs for themselves, coping and tolerance skills, so that the person is more able to cope with the naturally occurring aversive events that occur in daily life, and teaching functionally related and other skills that impact on the target behaviour. Focused support strategies reduce and if possible eliminate the need for reactive strategies by preventing target behaviour, and may typically include antecedent control strategies, and the use of time-based and differential reinforcement schedules (LaVigna & Willis, 2005a).

The fourth element and a key strength of the multi-element model is the inclusion of nonaversive reactive strategies to be implemented when target behaviours occur. The purpose of reactive strategies is not to provide consequences that might result in the reduction of occurrence of the target behaviour (that is the role of proactive strategies), but to gain rapid and safe control over the target behaviour and thereby reduce episodic severity (ES). ES is defined as a measure of the gravity or intensity of a behavioural incident and is measured within the context of a behavioural cycle as defined by its onset and offset criteria. Measures of ES may include duration of a behavioural outburst, cost of property damage, or severity of outcomes arising from an incident of aggression (LaVigna & Willis, 2005b). Included in this approach are a range of nonaversive crisis management techniques that can assist in the avoidance of restrictive practices while minimising ES. This model was found to have a substantial overall success rate and to provide cost-effective treatment when utilised extensively across Victoria, Australia (Radler & Hudson, 1996).

In addition to the benefits to the individual and the cost benefits that have been established, this model of intervention is consistent with the legislative framework for people with disability in Tasmania. These factors and the efficacy and sustainability benefits from the trainer of trainers approach outlined in LaVigna, Christian, and Willis (2005) were influential in the decision to undertake the trainer of trainers project in Tasmania.

A key aim was to evaluate whether a team of trainers, taught by a qualified expert in the use of the multi-element model, could train other staff to a level such that they could deliver a defined professional standard of behavioural assessment and intervention to people with disability and challenging behaviour. A further aim was for that training to facilitate effective and efficient client outcomes that would improve their quality of life.

Method

Participants

First-generation trainees. Tasmanian trainers were drawn from the group of 11 individuals (first-generation trainees) that completed the Level 1 (Lectures) and Level 2 (Longitudinal Practicum) training (see Procedures section) during 2004–2005 provided by the Clinical Director of the Institute for Applied Behaviour Analysis (IABA). Potential trainers were identified by IABA using the criterion that their reports submitted during the Level 2 training were assessed as meeting a standard of 85% or higher on the Assessment and Intervention Plan Evaluation Instrument (AIEI; LaVigna et al., 2005; see Table 1), and further, that those people then volunteered to undertake the trainer of trainers program. Four individuals volunteered with one deciding to withdraw due to competing demands following distribution of initial preparation assignments. The remaining three trainers all completed the program and were subsequently endorsed to replicate the Level 1 and Level 2 training programs in Tasmania.

Second-generation trainees. Second-generation trainees (i.e., those trained by the Tasmanian training team) included individuals working for Disability Services Tasmania within their resource teams as
Table 1. Outline of the Assessment and Intervention Plan Evaluation Instrument (AIEI) and sample scoring criteria

I. Identifying Information—person’s name, date of birth, present address, referring agency.

II. Reason(s) for Referral—source of referral, referral behaviours, key social agent’s reasons for referral and possible discrepancies.

III. Data Sources—methods used to collect assessment information (e.g., interviews, direct observation, records review, rating scales, and inventories).

IV. Background Information
   A. Client Description—age, gender, diagnosis, appearance, ambulation, motor skills, physical disabilities, cognitive abilities, expressive and receptive language, self-care skills, domestic skills, academic skills, leisure skills, community skills;
   B. Past and Present Living arrangements—location, relationships, type of residence, description of residence, family members;
   C. Past and Present Educational and Day service settings—location, type of service, description of service, relationships;
   D. Past and Present Health and Medical Status—general health, seizure activity, medication; and
   E. Past or Present Treatment received for referral behaviour(s)—description of any treatment received for currently referred behaviour problem now or in the past and the effects of those treatments.

V. Functional Analysis/Functional Assessment
   A. Operational Definition of Target Behaviour—topography, cycle, episodic severity, course, strength;
   B. History of the Problem—onset of target behaviour, duration, changes throughout history of problem;
   C. Antecedent Analysis—settings, locations, people, times, activities, immediate events that make the target behaviour more or less likely;
   D. Consequence Analysis—reactions of others to behaviour, methods used to manage the behaviour when it occurs, maintaining events;
   E. Ecological Analysis—ecological factors impacting on behaviour (inter-personal, programmatic, physical environment); and
   F. Impressions and Analysis of Meaning—list of hypothesis regarding the possible function(s) of the behaviour.

VI. Motivational Analysis—method of analysis, list of potential reinforcers.

VII. Mediator Analysis—description of key social agents and an estimate of their abilities and willingness to provide support.

VIII. Long-range Goals—in terms of quality of life measures.

IX. Short-range Behavioural Objectives—time-limited measurable objectives including criterion level and dates to determine achievement.

X. Data Collection—description of methods of observation and data collection and reliability checks.

XI. Support Strategies
   A. Ecological Strategies—specific recommendations regarding the person’s physical, inter-personal or programmatic environment;
   B. Positive Programming
      1. General Skills—statement regarding systematic training in areas of self-care, vocational, domestic, leisure, recreational, community. Should be functional, chronologically age-appropriate and performed under natural conditions,
      2. Functionally-equivalent Skills—description of specific behaviours to be taught that provide the person a more appropriate/effective way of achieving the function served by the target behaviour,
      3. Functionally-related Skills—description of specific skills to be taught that are related to, but not functionally equivalent to the target behaviour, and
      4. Coping/Tolerance Skills—description of specific skills to be taught that help the person tolerate or cope with the natural environment;
   C. Direct Treatment Strategies—description of strategies that are designed to produce rapid changes in the target behaviour (e.g., differential schedules of reinforcement, instructional control, antecedent control, stimulus control);
   D. Reactive Strategies—description of specific strategies for managing the target behaviour when it occurs to maintain safe and rapid control of the situation; and
   E. Staff Training and Development—description of specific strategies used to teach key social agents how to carry out the recommended support plans.

XII. Comments and Recommendations
   A. Anticipated Difficulties—statement regarding level of anticipated cooperation and motivation of key social agents;
   B. Additional Resources and/or services requested—statement regarding any other services the client may require (e.g., medical examination, psychiatric evaluation); and
   C. Strategies for Evaluating Treatment Outcomes—a time-frame for evaluating treatment outcomes and the need for continuous monitoring and revision of the recommended support plans.

Sample scoring criteria excerpted from the AIEI

V. Functional Analysis/Functional Assessment
   A. Operational definition of target behaviour
      1. Description of the problem behaviour
         - Topography (1)
         - Onset/offset (2)
         - Episodic severity measure(s) (3)
         - Course/precursors (4)
         - Strength (5,6)
         - Rate (5)
         - Episodic Severity (6)
Challenging behaviour training client outcomes

Performance, unsafe leaving, unexplained possession, self-injurious behaviour, outburst behaviour, non-performance, unsafe leaving, unexplained possession, aggression, the clients were female and 24 male. 56 years and included 7 children and 25 adults; 8 of Tourette syndrome. Clients ranged in age from 9 to 199.

Table 1. (Continued)

<table>
<thead>
<tr>
<th>Scoring criteria</th>
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<tr>
<td>(1) <strong>Topography.</strong> The physical characteristic (e.g., what it looks like and sounds like) of the actual target behaviour should be described (not its precursors or other associated behaviours which would be more fully described in the Course section below).</td>
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<td>(2) <strong>Cycle (Onset/Offset).</strong> The onset and the offset or other criteria should be stated for counting the occurrence of the target behaviour (e.g., First occurrence of the topography may be an onset criteria and having the topography absent for 5 minutes may be the offset). An event may also be scored in terms of its percentage of occurrence given an opportunity or observation interval.</td>
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<tr>
<td>(3) <strong>Episodic severity Measure(s).</strong> This should describe how episodic severity is measured, such as the average (and range of) duration of an episode, the average cost of repair or replacement resulting from an episode, the average severity rating based on scaled categories of topographies and/or the average severity rating based on scaled categories of outcomes. If episodic severity isn’t going to be measured, a justification and explanation should be provided.</td>
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<tr>
<td>(4) <strong>Course/Precursor.</strong> There should be a brief statement regarding the absence of pre-cursors. If there are precursors evident, then these should be described in order of their occurrence. Then, there should be a description of how a typical episode of target behaviour unfolds, along with a description of post-cursor behaviours and the incidental behaviours that are concomitant with pre-cursor, target and post-cursor behaviour. This course of a typical episode may be contrasted with the course of a severe and/or a mild episode.</td>
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<tr>
<td>(5, 6) <strong>Strength.</strong> The current measured or estimated rate (5) or other quantified measure of behavioural occurrence should be described. Rate is defined as average frequency per a unit of time or percentage of opportunity or observation intervals. The current rate should be stated in terms that are consistent with the Cycle definition. Episodic severity. The current measured or estimated level of episodic severity (6) of the behaviour should be described. This can be stated in terms of some measure of central tendency (mean, meridian or mode) and range. For example, this may be in terms of duration, cost of repair or replacement, scaled severity of topography of outcome, averaged for the incidents of target behaviour that occur.</td>
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Allied health or nursing professionals, individuals with degree qualifications or adult education qualifications working in leadership roles within government and nongovernment service provision organisations. Second-generation trainees self-nominated for participation in the program.

**Clients assessed.** The clients that were assessed in the Level 2 training, during 2004 and 2005 by first-generation trainees and between 2006 and 2009 by second-generation trainees, were all clients of Disability Services Tasmania meeting the eligibility criteria for service and were rated by Disability Services as Priority 1 or 2 according to Disability Services referral prioritisation guidelines. They included children and adults with cognitive limitations as a result of intellectual disability and acquired brain injury. Some were also identified as having attention deficit disorder, autism spectrum disorder, Down syndrome, epilepsy and/or a diagnosed mental health condition such as schizophrenia, personality disorder, or Tourette syndrome. Clients ranged in age from 9 to 56 years and included 7 children and 25 adults; 8 of the clients were female and 24 male.

**Informed consent**

All trainees in the practicum program volunteered for the training and attended with the support of their employers. Explicit consent was sought for each person for whom assessment services were undertaken and provided by the person responsible for each client or by the client directly. Consent was provided firstly for the assessment to be undertaken and separately to have the clients’ case details discussed as part of the training program. Additionally, all trainers had signed a confidentiality agreement as a condition of their employment.

**Ethical approval**

The data for this paper was originally collected for program evaluation and quality assurance purposes, not research purposes, and did not therefore require ethical approval. As no further human contact was required, the current study was undertaken.
as an archival review and permission was granted to analyse and report on the deidentified data by the Human Research Ethics Committee (Tasmania) Network.

Procedure

Participant training. Trainees attended lectures in Southern Tasmania (Hobart), Northern Tasmania (Launceston), and North West Tasmania (Penguin and Burnie). The practicum components of the training were conducted over a 9-month period in settings throughout Tasmania where Disability Services consults or operates. The training was repeated in the years 2006 to 2009. The training given to participants on assessment and intervention processes by the Tasmanian trainers was delivered under the supervision of IABA during 2006 and independently thereafter:

Training methods included lectures, Socratic discourse, reading assignments, practicum assignments, repeated practice, group activities, individual written feedback, group feedback and modelling. This training took place at two levels. Level One training consisted of 4 days of lectures, for 6 hours a day, including (but not limited to) topics such as IABA’s multi-element model, functional behavioural assessment, positive programming to teach functionally equivalent and other replacement behaviours, focussed support strategies, including (but not limited to) the use of antecedent control and the use of preferred activities and events to reduce the need for reactive strategies, reactive strategies and emergency management within a non-aversive framework and systems for assuring staff/programme consistency. After completing Level One training, trainees entered Level Two training, a Longitudinal Practicum, which included four Modules and three inter-module practicum assignments relating to carrying out a comprehensive functional assessment, developing a positive, multi-element behavioural support plan and implementing that plan for an actual client referral. Level Two training involved 9 days spread over a period of [9] months. Level One and Two trainings were provided by IABA for first generation trainees. Second generation trainees received Level One and Two training from the [Tasmanian training team] with the coaching, support and supervision of IABA. 

Upon completion of Level One and Level Two training, they [all first and second generation trainees] submitted the comprehensive functional assessment and recommended support plan they had completed and implemented, based on the Level Two practicum assignments. (LaVigna et al., 2005, p. 147)

Trainer training. The Tasmanian training team was prepared, supervised, and monitored by IABA during the first training replication (i.e., 2006, second-generation training):

Lectures, role play situations, readings, assignments and supervised experience were used to train the team. Specifically, training for trainers included:

1. access to materials used by IABA during the first round of training (e.g., overheads, lecture notes, pre- and post-tests);
2. meeting with IABA to discuss the materials;
3. preparation of materials, including a review of the logic of each section and the major points of each section;
4. a determination of which trainers were most comfortable with which material and determination of who on the team would present what materials, with back-ups and alternates identified;
5. practice sessions when requested;
6. a meeting to discuss final questions, concerns, doubts, etc., prior to the first training session; and
7. after training sessions, team members critiqued each other’s performance and IABA critiqued the team’s performance. (LaVigna et al., 2005, p. 147)

To reduce reliance on the feedback of an external agent, the Tasmanian training team members also critiqued each other so that they would become independently able to critique the team’s own performance. Audience feedback was also sought through evaluation forms and verbal feedback to aid in this process.

Measures

Reports submitted by trainees between 2006 and 2009 were evaluated for quality, and interrater reliability indices were calculated for report quality. Each report was marked by the primary reviewer, a member of the Tasmanian training team. The trainees’ views on the process and usefulness of the training were also captured using a social validity survey.

A report summarising client demographics, psychosocial history, and presenting problems was submitted by each trainee (see Table 1, I to XII, for a detailed description of the assessment and support plan components). Reports also documented measures of the clients’ target behaviour as an outcome of intervention at both baseline and after 3 months’ intervention. These outcomes were collated and summarised in terms of occurrence and ES of behaviour and qualitative quality-of-life outcomes.
Thirty-two of the completed reports submitted during training undertaken in Tasmania between 2006 and 2009 are included in this study. Fifty-three second-generation trainees enrolled during this period; of these, nine withdrew and did not submit a final report. Reasons cited for withdrawal included trainees changing roles within their organisation and could not complete follow-up, while other trainees did not complete the assessment due to health reasons, personal circumstances, or change of employment. There were 44 final reports submitted that were assessed to determine if they included data for occurrence and ES at baseline and at 3 months, and to see if there was evidence of implementation of at least one element of the recommended support plan. Ten reports did not meet these criteria and were excluded from the study. Of the remaining 34 reports, two reports were excluded because the reductions were influenced by factors unrelated to the recommended support strategies. In one case, the client could not engage in the target behaviour due to immobility as a result of a medical condition, and in the other, the client was in hospital and sedated for reasons unrelated to the target behaviour. This left 32 reports remaining, which represents 73% of reviewed reports that were subsequently included in the study.

Two measures used in the previous study, the AIEI (see Table 1) and the Social Validity Survey (SVS; LaVigna et al., 2005; see Table 2), were used to objectively determine the quality of the reports by trainees and their views on the training, respectively.

**AIEI.** The AIEI contains 140 objectively defined criteria against which report quality is assessed by trainers. Table 1 gives an overview of the contents of the AIEI and sample scoring criteria. The AIEI includes:

- requirements for 12 different areas of content for the comprehensive evaluation of a functional assessment report and support plan against 140 defined standards. ... [It was] developed with the goal of providing formalised measures of the completeness and thoroughness, i.e. clinical soundness of functional assessments and support plans. Versions of the evaluation instrument have been published elsewhere [LaVigna, Willis, Shariff, Abedi, & Sweitzer, 2000; Willis & LaVigna, 1990]. The inter-rater reliability and criterion validity of the instrument also has been tested (Ballmaier, 1992, unpublished doctoral dissertation) and both reliability and validity were demonstrated at the < 0.01 level of error probability. (LaVigna et al., 2005, p. 148)

Trainees reviewed the submitted functional assessment reports and intervention plans, which were scored on the AIEI. A “+” was recorded if an item met the scoring criteria as defined on the evaluation instrument, an “O” was scored if it did not, and an “N/A” was scored if the item was not applicable. Each report was given a percentage score, which was calculated by adding the total number of “+”s and dividing by the total number of criteria scored.

**Social Validity Survey (SVS).** Both first- and second-generation trainees were asked to complete the SVS at the end of their training. The SVS is a 13-item survey containing questions relating to, for example, the participants’ views on the training process, relevance to the participants’ work role and usefulness to clients. The questions are reported in Table 2. Items were rated on a Likert scale of 1–5, with 1 representing less than expected, not significant, not at all, or less than justified, and 5 signifying more...

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**Table 2. Social Validity Survey questions for trainees**

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<tr>
<th>Survey question</th>
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<tr>
<td>1. Please rate the overall quality of the longitudinal training course.</td>
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<tr>
<td>2. The training you received met your expectation.</td>
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<tr>
<td>3. The training you received will affect your professional practice.</td>
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<tr>
<td>4. The contribution of the introductory lectures to the overall quality of training was ...</td>
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<tr>
<td>5. The contribution of the practicum to the overall quality of training was ...</td>
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<tr>
<td>6. The contribution of the written feedback to the overall quality of training was ...</td>
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<tr>
<td>7. The contribution of the verbal feedback to the overall quality of training was ...</td>
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<tr>
<td>8. The contribution of hearing other cases to the overall quality of training was ...</td>
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<tr>
<td>9. The usefulness of the feedback provided by the instructor was ...</td>
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<tr>
<td>10. The public feedback provided by the instructor was positive ...</td>
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<tr>
<td>11. The time and money invested in this training by myself and my agency is ...</td>
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<tr>
<td>12. As a result of the work in this course, I believe my focus student/client will benefit.</td>
</tr>
<tr>
<td>13. As a result of the work in this course, I believe my future students/clients will benefit.</td>
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than expected, very significant, greatly, or more than justified. All Social Validity Surveys were completed anonymously thereby allowing respondents to be frank in their responses.

Client outcomes. All clients’ data for the 32 reports included in this study were recorded using measures of occurrence appropriate to the presenting behaviour such as rate, percentage of opportunity, or interval recording. The ES of each incident was similarly measured by, for example, duration, cost of repair or replacement, degree of outcome, etc. Based on these measures, data for occurrence and mean ES at baseline and 3-month follow-up were calculated. These data were then transformed to percentage of baseline figures to allow comparison across cases.

Raters

The authors and one other co-rater independently rated reports from the 2006 and 2008 cohorts using the AIEI to determine the quality of the reports. The same reports were used to calculate interrater reliability. All raters had competence in writing comprehensive functional assessments and support plans demonstrated through completion of the requirements of the trainer of trainers program. The raters each had at least 10 years’ experience in the field of developmental disability and practised as psychologists, speech pathologists, or social workers in Tasmania’s disability sector. Training in the use of the tool was incorporated within the training of trainers program through practice scoring using the AIEI of partially completed reports submitted during the course of the training and discussion of those results.

Interrater reliability

Twenty reports (13 from the 2006 cohort and 7 from the 2008 cohort) were independently rated by two raters to determine interrater reliability indices for the scores obtained by participants on the AIEI. This represents 62% of the 32 reports included in the study. Interrater reliability indices were calculated according to the following formula:

\[
\frac{\text{# Agreements}}{\text{# Agreements} + \text{# Disagreements}} \times 100 = \% \text{ Reliability}
\]

Observational reliability

Observational reliability indices for client outcome data (occurrence and ES) were required as part of the final report for the Level 2 training. At the time of the archival review, 10 of the 32 reports had observational reliability indices for baseline figures of occurrence and ES immediately available, and 18 of the 32 had observational reliability indices for 3-month figures of occurrence and ES. These are presented as a sample of observational reliability data from the reports.

Periodic service review (PSR)

The PSR methodology can be used as a tool for measuring and monitoring the quality of service provision at both a systems and individual level (LaVigna et al., 2000). This methodology was applied during the training of trainers project. Within the Level 2 training, it was used as an instrument to evaluate the implementation of the strategies listed in the trainees’ intervention plans for their focus client.

Each trainee developed a PSR reflecting the implementation of each of the key elements of their recommended intervention plan, including data collection, observational reliability checks, and treatment fidelity checks. They also included at least one ecological, focused support, and reactive strategy, and four positive programming strategies. These were then reviewed monthly in order to monitor the extent of implementation of each individual client’s recommended intervention plan. PSR figures reported later in the study are based on the score at 3 months of implementation. The PSR scores were available, at the time of the archival review, for 23 of the 32 reports.

At a minimum, each PSR included 10 items to be monitored. Where more than one strategy was recommended under a heading such as ecological strategies, an additional corresponding item for monitoring was included. A standard is written for each item such that the criteria for scoring a “+,” meaning the standard was met, or an “O,” meaning there is an opportunity for improvement, can be scored. For example, if a recommendation was made to introduce a visual timetable as an ecological strategy the item to be monitored might read, “based on observation, a ‘+’ is scored if a visual timetable is present and current, and the client is engaging in an activity as per the schedule.”

Referral data

Each client included in the study was identified by Disability Services as requiring a functional behavioural assessment, and their priority of need was classified according to the Disability Services referral prioritisation guidelines as Priority 1 or Priority 2.

Priority 1 is the most urgent category. Criteria for being assessed as Priority 1 include immediate threats to health and safety of self or others, breakdown of family support, or breakdown of work or accommodation. A referral is assessed as Priority 2 if there is a presenting issue, which, if not addressed, is likely to lead to any of the following criteria: threats to health and safety of self or others, breakdown of family support, breakdown of work or accommodation.

**Results**

**Training outcomes**

*AIEI.* The quality of the reports produced by the trainees, as measured on the AIEI, are listed in Table 3. AIEI results were available at the time of review for all participants from 2006 (13) and 2008 (11) and are reported in this table. They represent 75% of all reports included in this study.

LaVigna et al. (2005) reported a mean AIEI score of 78.5% with a range of 56–94% for reports submitted by trainees under their instruction. The mean AIEI score for the participants under the instruction of the Tasmanian trainers was 79.5% with a range of 44–94% for Tasmania 2006, and a mean AIEI score of 80.2% with a range of 64–92% for Tasmania 2008.

**Interrater reliability.** Indices of interrater reliability were calculated for reports submitted for 2006 and 2008. The figures from the Tasmanian training and those from LaVigna et al. (2005) are included in Table 4.

LaVigna et al. (2005) reported a mean reliability index of 85.0% with a range of 73–100% across reports and raters. The mean reliability index for Tasmania 2006 was 85.2% with a range of 74–94%, while the Tasmania 2008 figures had a mean of 85.3% with a range of 83–92%. The high level of interrater reliability achieved by LaVigna et al. (2005) was replicated and maintained in this study.

**Table 3. Tasmanian post-training results compared to LaVigna et al. (2005)—AIEI**

<table>
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<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>Range</th>
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<tbody>
<tr>
<td>LaVigna et al. (2005)</td>
<td>36</td>
<td>78.5%</td>
<td>56–94%</td>
</tr>
<tr>
<td>Tasmania 2006</td>
<td>13</td>
<td>79.5%</td>
<td>44–94%</td>
</tr>
<tr>
<td>Tasmania 2008</td>
<td>11</td>
<td>80.2%</td>
<td>64–92%</td>
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**Social validity.** Social Validity Surveys were conducted to evaluate participants’ satisfaction with aspects of the training process, relevance to their work area, and usefulness in assisting their clients. Participants’ ratings on the Likert scale for each of the 13 items on the SVS were summed and converted to a percentage score, where the total score achieved for each item was divided by the total score possible. The higher the Likert score, the higher the percentage score, and therefore the higher the participants’ satisfaction with the training.

Figure 1 shows that the Tasmania 2006 and 2008 profiles indicate that participants rated the training highly. These profiles are similar to those achieved by LaVigna et al. (2005). The total mean for all SVS item scores from LaVigna et al. (2005) was 88.3% with a range of 69.2%–98.5%; for the Tasmania 2006 cohort the mean survey score was 89.8% with a range of 77–97%; for the Tasmania 2008 cohort the mean survey score was 84.8% with a range of 76–94%. Using a one-way ANOVA there were no statistically significant differences between groups, \(F(2, 36) = 2.31, p = .11394.\)

**Client outcomes**

Client outcomes for occurrence and ES are reported at 3 months as a percentage change from baseline (i.e., baseline = 0%), such that positive “+” percentage scores indicate an increase in occurrence or ES, respectively, while “−” percentage scores indicate a decrease.

**Occurrence.** Observational reliability indices at baseline for occurrence data had a mean of 85.5% and a range of 25–100%, and were calculated from the results available for 10 of the 32 reports utilised for client outcomes. Reliability indices for occurrence data at 3 months had a mean of 82.7% and a range of 50–100%, and were calculated from the results available for 18 of the 32 reports utilised. These figures are listed in Table 5.

Figure 2 shows a comparison of occurrence at baseline and after 3 months of intervention for the 32 reported cases. Twenty-nine trainees demonstrated a reduction in occurrence of target behaviour over the 3-month initial implementation period. Two trainees reported an increase in occurrence.
of behaviours at 3 months. In both these cases (8 and 27) the reliability of data collection at baseline was low and this may have artificially deflated the baseline figure. For example, in case number 27 the reliability index at baseline was 25% and at 3 months 65%.

The mean change for occurrence at 3 months was \(-49.6\%\) of baseline with a range of \(-100–67\%\), which, using a one-tailed single sample \(t\) test, was found to be a statistically significant reduction, \(t(32) = -7.66, p = .000000\).

*Episodic severity (ES).* Observational reliability indices at baseline for ES had a mean of 84.5% and range of 25–100%, and were calculated from the results available for 10 of the 32 reports utilised for client outcomes. Reliability indices for ES data at 3 months had a mean of 84.4% and a range of 50–100%, and were calculated from the results available for 18 of the 32 reports utilised. These figures are listed in Table 5.

Figure 3 shows a comparison of ES at baseline and after 3 months of intervention for the 32 reported cases. Thirty of the 32 cases reported ES data at the 3-month follow-up. Since ES data is calculated from occurrences, there could not be any ES data from cases 13 and 25 as their target behaviours (outburst behaviour and physical aggression) were eliminated entirely by this stage of the intervention. Of the 30 cases remaining, 27 cases demonstrated a reduction in ES of target behaviour at the 3-month follow-up. Two cases (11 and 29) showed maintenance of ES, but a reduction in occurrence. One case (24) reported an increase in ES, but a reduction in occurrence.

The mean change for ES at 3 months was \(-30.8\%\) from baseline with a range of \(-74–10\%\), which,
using a one-tailed single sample t test, was found to be a statistically significant reduction, \( t(30) = -8.23, p = .000000 \).

**Periodic service review (PSR)**

The PSR was used to monitor implementation of support plans. PSR results are provided from a sample of 23 of the 32 reports. Scores on the PSR indicate the extent of implementation of plans at 3 months. The mean PSR score was 47% with a range of 19–86%. This indicates that the results achieved for client outcomes of occurrence and ES were the result of plans that were only partially implemented and had a mean of 47% of listed intervention strategies implemented.

**Referral data**

Figure 4 shows a comparison of referral priority for clients who were assessed by the first- and second-generation trainees in the Level 2 training expressed as a percentage of total referrals per year. This shows a reduction in priority of referrals from 100% Priority 1 in the first year of training provision to 25% after the training had been provided within Tasmania for 5 consecutive years.

**Discussion**

**Training outcomes**

The trainee outcomes on the AIEI scores demonstrate that the Tasmanian training team was able to train allied health professionals, nurses, and service managers to meet defined professional standards in the provision of comprehensive functional assessment and associated positive multi-element behavioural intervention plans to the same level as IABA trainers. These AIEI results were achieved during 2006 under the supervision of IABA and again in 2008 as an independent training team without IABA supervision. The high interrater reliability scores support this claim as an outcome of the training process, and given the consistency of results, it is reasonable to conclude that a similar level of quality was also achieved in 2007 and 2009.

The results of the one-way ANOVA on the SVS indicate that the Tasmanian trainees considered the training as delivered by the Tasmanian team was not different in terms of social validity to when the training was conducted by an IABA expert in the multi-element model. The high level of trainee satisfaction was an important aspect of the success of the program. The trainees’ views that the training method, its relevance to their work, and particularly its usefulness for clients were important to the ongoing support and success of the training of trainers project in Tasmania.

The results associated with the Tasmanian trainer of trainers project in terms of trainee performance,
interrater reliability, and social validity achieved in this study replicates the outcomes achieved by LaVigna et al. (2005). Furthermore, this study has demonstrated that the training process can be used to train allied health professionals, nurses, and service managers, and is effective in a statewide disability service system for adults and children across a range of diagnostic groups. To this extent the study expands the work of LaVigna et al. (2005).

**Economic implications and sustainability**

Radler and Hudson (1996) report cost reductions resulting from similar types of interventions yielding a mean of AUD$40,510.00 per client with a range of AUD$2,284.00–$132,697.00 per year. These savings were related to factors such as reductions in crisis and respite accommodation, extra staffing, medical and injury, and repair and maintenance. Within the present study, anecdotal reports indicated that as client behavioural issues were resolved there were substantial related cost savings resulting from a reduction in support hours, staff injury costs, property damage, and administrative costs associated with issues such as complaints management and grievances. More specific investigation of cost savings could be included as a variable for future investigation.

**Client outcomes**

Achieving consistency, quality of training, participant satisfaction, and cost effectiveness are important in any clinical training program but the imperative for providing this trainer of trainers program was to improve outcomes for clients. The reporting of client outcomes represents a major extension of the LaVigna et al. (2005) study. Many of the clients receiving services as part of the training project were at risk of injury, loss of accommodation support, placement away from family or incarceration, and all were experiencing significant detrimental impact on their quality of life.

Twenty-six clients experienced a demonstrated improvement in the outcome data for both occurrence and episodic severity, which was attributable to the intervention plan developed and implemented by the trainees. These changes to occurrence and ES were demonstrated to be statistically significant. With a mean PSR score of 47% reflecting partial implementation of plans, there was a mean reduction in occurrence of −49.6% and a mean reduction in ES of −30.8%. It should be considered when interpreting results for ES that no 3-month ES data is included for the two cases in which occurrence reduced to 0 (13 and 25) even though these represent significant outcomes. Given that the results achieved for client outcomes of occurrence and ES were the result of plans that were only partially implemented (mean PSR of 47% of listed intervention strategies implemented at 3 months), it is considered that with complete implementation of plans a greater decrease in occurrence and ES would be demonstrated. An area for future study would be to look at the impact of implementing each category of strategy, specifically ecological, positive programming, focused support, and reactive strategies, on occurrence and ES.

The results were achieved with clients presenting with a wide variety of serious challenging behaviours and diagnostic characteristics. The broad range of problem behaviours and the circumstances of the

![Figure 4. Comparison of Priority 1 and 2 referrals for each year that Level 2 training was delivered in Tasmania (N = 69).](image-url)
individuals demonstrate the effectiveness of the multi-element model for a broad range of diagnostic groups and service delivery settings.

Quality-of-life outcomes

Trainees also anecdotally reported improvements in the quality of life of clients. Such improvements included reductions in use of medication, elimination of seclusion and other restrictive practices, maintaining children living within their family unit, no further child protection notifications, improvements in preferred living situation, such as moving from a group placement to living in a place of one’s own, or from living with people the person disliked to living with people that they liked, meeting conditions of legal orders and avoiding returning to prison, returning to full-time school attendance, increases in skills, increases in the range of activities undertaken, and increases in community participation. These anecdotal reports reflect a need to formally evaluate improvements in this area in future studies.

Systemic effects

The reduction in severity of referral made to the Level 2 training shows that the training also impacts at a systems level. Clients with complex needs and behaviour difficulties were being supported with sophisticated multi-element intervention plans based on comprehensive functional assessments developed according to clearly defined standards. As a result of the training, those staff within the service system responsible for developing such responses had improved skills and processes for doing so.

During the period of the study there was a reduction in Priority 1 referrals and an increase in Priority 2 referrals made to the Level 2 training program. It is possible that the service systems’ improved capacity for effectively supporting clients’ complex behavioural needs contributed to this change in referral pattern and may have reflected a resulting decrease in severity of need within the sector. It would be useful to pursue this issue in future research.

Investigations into the exact mechanisms leading to this reduction are beyond the scope of this research; however, it is reasonable to consider that the training has contributed in some key ways. First, that each client assessed during the training received an assessment and plan that met their needs, effectively reducing the number of people requiring such services. Second, that highly trained staff members were able to utilise their skills to respond effectively in a more proactive manner, thereby reducing the number of clients whose needs escalated to a Priority 1 level requiring such an assessment. Third, that having completed the Level 2 training, second-generation trainees were able to use their skills (from the training) to respond to Priority 1 referrals on an ongoing basis, thereby further reducing the number of Priority 1 referrals to the training. Effectively, these factors combine such that there would be less reliance on the training process to provide behavioural assessments and associated support plans for clients with needs categorised as Priority 1.

This study demonstrates that the IABA trainer of trainers approach of delivering Level 1 and Level 2 training can develop trainees’ skills to meet defined professional standards in the areas of behavioural assessment and PBS plan development. It also clearly demonstrates that the training can be replicated consistently and sustainably by using the established training of trainers process. Furthermore, behavioural assessment and PBS plans developed according to the procedures described in the training process consistently deliver effective interventions for clients from a broad range of diagnostic groups who present with severe challenging behaviour. This is evidenced by the client outcomes, which included significant reductions in the occurrence and episodic severity of target behaviour, as well as anecdotal reports of improvements in quality of life. It also suggests that regularly repeated training may have implications for prevalence of challenging behaviour within a service sector.

Challenges

In many cases, these outcomes occurred within a context of complex mediator issues relating to large systemic changes, where all government run services (accommodation, day options, and respite) would move to the nongovernment sector, resulting in affected support and management staff experiencing uncertainty about their future employment during the period 2006–2010. This impacted on participant completion rates as a number changed their employment during the course of the training. Further, participants who did complete the training were frequently working with staff teams who were unsure of their employment status.

Within a Tasmanian context, the biggest challenge for this initiative was maintaining sustainability of a training team in a small service system while maintaining the integrity and quality of the program. Given the extensive systemic changes within the state’s disability service sector, this sustainability was reliant on the commitment of the trainers to the process and
the effort of key individuals in the sector who secured funding to deliver the training each year.

Recruiting and maintaining additional trainers to the training team has been a challenge, with anecdotal feedback indicating that the commitment of time required against competing work and family demands can be a significant deterrent. Future work to develop resources and criteria for providing training and evaluating performance of additional trainers who are trained by the Tasmanian training team is required. This will assist in balancing demands of delivering training with skill development of new trainers. Future research could look at evaluating this process to compare outcomes of trainers trained by the Tasmanian team with those trained by IABA.

Summary

The reported trainee outcomes support the first aim of the study, which was to establish a self-sufficient team of trainers in Tasmania that could repeatedly train staff to deliver high quality behavioural intervention services to people with disability and challenging behaviour. Additionally, there is clear evidence for the achievement of the second aim—that such training should facilitate effective and efficient client outcomes that improve people’s quality of life. Furthermore, the efficacy of the trainer of training program and the multi-element model was demonstrated with a broad range of clients from various service delivery settings. The training project was central in improving behavioural services delivered in Tasmania, as measured by their ability to meet defined standards and to improve client outcomes, and in contributing to a substantial decrease in Priority 1 referrals within the service system.

If PBS is to be used broadly, it is necessary for training programs to reach large numbers of professionals responsible for developing intervention plans for people with intellectual disability and challenging behaviour. This study suggests that a trainer of trainers model can be effective in increasing the number of people who are proficient in developing effective PBS programs.

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