An independent outcome study of a Pivotal Response Training (PRT) intervention for children with autism

An Autism Spectrum Australia (Aspect) model class pilot project

Key Personnel: Dr Chris Kilham, University of Canberra and Dr Debra Costley, Aspect

Project Summary

Background

Pivotal Response Training (PRT) is described by leading proponents as "a comprehensive service delivery model that uses both a developmental approach and applied behaviour analysis (ABA) procedures. PRT aims to provide opportunities for learning within the context of the child's natural environment" (Koegel & Koegel, 2006).

It is implemented in natural settings in order to foster a normalised developmental trajectory and facilitate inclusion. PRT also involves a high-level of family involvement, and incorporates the procedures into everyday routines at home and school.

A defining feature of PRT is its focus on "pivotal" areas or responses that are alleged to underlie large collateral changes in other areas of functioning. Thus, PRT addresses generalisation, a skill which has consistently been found to pose difficulties for people on the autism spectrum.

Because the intervention is designed to produce widespread improvement in other areas, PRT is more efficient than Discrete Trial Training which gives priority to isolated individual behaviours and typically requires intensive and expensive training of about 40 hours a week.

Five pivotal areas have been identified. The two primary areas are motivation, and responsivity to multiple cues. Emerging pivotal areas include self-management, self-initiation, and empathy.

"PRT aims to provide opportunities for learning within the context of the child's natural environment (Koegel & Koegel, 2006)."

What does PRT look like in practice?
Case study: James (Part 1)

When James first attended Aspect South Coast School, he presented with high levels of anxiety. This manifested itself in extreme physical stiffness and regular prolonged tantrums, especially at points of transition. Although James was verbal, his functional communication was poor. Attempts by the staff to communicate verbal instructions to him were generally met with tantrums and extensive 'scripting' of learned phrases related to the activity in question (e.g. toileting).

Given these challenges, James's teachers began the PRT intervention by suspending all verbal instruction and using visual communications only. Their ultimate goal was to teach James to make independent requests and choices that could be generalised across settings.

Initially using visual supports, the staff introduced James to a basic "I want" script, using chewy lollies as a reward for communicative efforts. These lollies had been found to be effective reinforcers for a number of students, as the physical action of chewing them produced a calming effect, and the range of different colours worked well as the 'multiple cue' element of the PRT approach. To begin with, James was rewarded with a lolly every time he attempted to communicate, but after a while he was 'rationed' to five lollies a day which he could request at a time of his choosing. The lollies were put into a clear box so that he could see when they were all gone.

Following this, the staff began adding names to the beginning of the "I want" script so that James could direct requests to specific individuals. After six months of visual scripting, James' teachers reintroduced verbal language to the PRT process.

The Aspect Model Class Project

Aspect has developed the concept of model classes in order to trial new evidence-based interventions and practices that may be incorporated as part of the Aspect Comprehensive Approach for Education (ACAE). Interventions are introduced as part of a research project in a small number of classes across two or more Aspect Schools. PRT has strong empirical support, and so Aspect decided to conduct a pilot study in two classrooms in 2010, following staff training in the approach in 2009. The results of that evaluation are presented in this report. The program was implemented in Terms 2, 3 and 4 in 2010, with follow up data collected in Term 2, 2011. The evaluation reported here investigated the outcomes for these Aspect students, their teachers and parents of a train-the-trainer model where teachers received instruction in PRT at their workplace and were then supported to implement the approach in their classrooms. Teachers and teacher's aides were also given the opportunity to take part in distance learning leading to a certificate in PRT. Parents were also given information and training by Aspect staff, to support them to implement the approach at home.

The main purpose of the study was to examine:

- the fidelity of the PRT intervention (that is, whether the practice of PRT is adhered to. Processes and documentation will also be discussed).

- the effectiveness of the PRT intervention (particularly in terms of student outcomes).

- the social validity (acceptability) of PRT.

How was progress measured?

EVALUATION QUESTIONS	PRIMARY EVALUATION TOOL
Is PRT being implemented as intended? (Is it feasible?) 1. Are instructions clear, appropriate, and uninterrupted and does the teacher have the child's attention? 2. Are maintenance tasks interspersed frequently? 3. Are multiple cues present? 4. Is the child given a sufficient role in choosing the stimulus? 5. Are rewards immediate, contingent, uninterrupted and effective? 6. Are direct reinforcers used? 7. Are rewards contingent on response attempts?	• DVDs • Teacher diaries • Staff focus group • Staff questionnaire • Parent questionnaire
What are the student outcomes in general? **What are the student outcomes in the 5 pivotal areas?** 1. Is the child motivated /engaged? 2. Is the child responsive to multiple cues? 3. Does the child self-manage his behaviour? 4. Does the child initiate requests? 5. Is the child empathic?	• Standardised tests (CARS, SB-5, CELF, Vineland) • DVDs • Teacher diaries • Staff focus group • Parent teleconference/discussion • Staff questionnaires • Parent questionnaires • Teacher 5x3 observations
What is the social validity /usefulness of PRT, for teachers and parents?	• Teacher diaries • Staff focus group • Parent teleconference • Staff questionnaire • Parent Questionnaire

What were the outcomes?

In relation to the first purpose, **program fidelity** is important, as it demonstrates whether staff are implementing PRT properly. If program fidelity is low, then student outcomes cannot be attributed to "real" PRT. In this evaluation, fidelity was measured by examining staff actions against the criteria in the table above (is it feasible?).

The evaluation found that **high program fidelity** was demonstrated in the teacher diaries, staff focus group and teacher questionnaires. The available DVD data showed it was being implemented properly by both schools by the end of the year. Unexpectedly, the DVDs and teacher observations also showed at least some staff were already implementing PRT correctly in the baseline, even before the trial was scheduled to begin. Moreover the teacher questionnaires suggested that both schools were using PRT-based practices right from the outset.

In relation to the second purpose, the study measured **student outcomes** primarily by the children's progress in the five pivotal areas of:

- motivation
- responsivity to multiple cues
- self management
- self initiations, and
- empathy

The DVD content showed that the students were responding well in two pivotal areas (*responsivity to multiple cues; and motivation* as measured by highly engaged on-task behaviour). This conclusion was corroborated by other data. Three students who were unable to respond to tests at baseline were able to be examined on verbal standardised tests by the end of the year, suggesting greater engagement. In addition, the teacher focus groups, teacher diaries and parent teleconference documented increases in the children's motivation for communication and their use of multiple cues.

Diaries and staff focus groups and parent teleconferences and questionnaires indicated improved *self management*, although the children's increasing independence led to some challenges.

Responses were mixed about the pivotal area of *self initiations*. DVDs indicated the children were not frequent initiators, but staff focus groups and parent teleconferences and teacher observations suggested some improvement in this skill.

Empathy was low in the DVDs but the parent teleconference suggested there were improvements in this area. One of the teachers mentioned she was not working on empathy. This is not unexpected, since empathy is the least well developed pivotal area by PRT practitioners and theorists.

Overall, there was converging evidence that the **students were making good progress in the pivotal areas of motivation and responsivity to multiple cues** and making some progress in self management and initiations. Empathy was not a prime focus of teachers, although parents reported a little development in this area.

In relation to student outcomes, the Aspect parent data compared favourably to a larger sample of parent responses taken from a study with younger children in Portland, Oregon. The Aspect parents noted improvements in the children's use of language or other means to communicate, and in their engagement in imaginative or pretend play.

Finally, in relation to the third purpose, it was found that PRT had **high social validity** for parents and teachers. They worked well together, valued and enjoyed the approach, and attributed much of the children's progress to PRT, and so would be amenable to continuing this approach. High acceptance of PRT was evident in the teacher diaries, staff focus groups, parent teleconference and questionnaires.

What do PRT outcomes look like in practice?
Case study: James (Part 2)

The 'lolly' reward system set up for James proved successful in developing his ability to self-regulate his behaviour. Initially James would eat all of his allocated lollies in a short period of time, but he soon realised that this meant there were no more lollies for later on. He now regulates and manages his own rewards throughout the day.

James adapted well to the progressive augmentation of his "I want" script. He learnt to address his requests to particular individuals and was soon able to generalise beyond his familiar teachers, for example to casual staff. Following this, James started to generalise the "I want" communication to new targets, including independently asking to go to the toilet. This was a huge turnaround for James, as going to the toilet had always been an issue for him.

James' concentration, engagement and emotional regulation greatly improved as he developed his understanding of the communicative function of language. Whereas previously directed speech had been little more than 'noise' to him, the PRT intervention helped him to see that language could both be organised and predictable, and serve as a means to request and instigate behaviour in others. As a result, he became capable of following instructions, such as *"sit down and wait"*, that would previously have caused him great stress and anxiety.

What do PRT outcomes look like in practice?
Case study: James (Part 2)   *(continued)*

He is now able to manage a very busy and noisy environment without distress and can use language to manage situations.

A further benefit of the intervention was that James began to relate much better to the other students. Over time, he recognised that they too were using "I want" scripts (indeed, some children were noticed to be modeling James's own scripting) and it is evident that this made their behaviour much more predictable to him. James's progress has been well maintained, even through the significant recent disruption of moving to a new classroom. His mother has also reported that James is successfully using the "I want" script at home.

Staff at the school had already been implicitly applying PRT principles before they were formally introduced to the approach and trained in its methods. Nonetheless, they found the training to be helpful in providing a framework and rationale for the techniques they had successfully used to communicate with students. The staff commented that PRT is very easy to implement, as it is largely intuitive and does not require extensive resources. As an intervention, it has the advantage of straddling the domains of both communication and social behaviour.

Interpretation

The evaluation was designed around a simple pre-post framework. Student outcomes were measured early in 2010, then PRT was begun and student outcomes were measured again later in the year or early in 2011. In this study the outcomes for students were predominantly positive.

Fidelity was measured, using the logic that if staff were not implementing PRT properly (i.e. low fidelity), then student outcomes could not be attributed to PRT. In fact it was found that staff implemented PRT acceptably (high fidelity) throughout the year, including during the baseline period before the PRT trial began. These results meant that only a conservative conclusion can be drawn. That is, the results are consistent with the interpretation that PRT is associated with some of the positive student

outcomes. However other factors, such as child maturation, and staff and parent expectations, could not be excluded as possible contributors to the results. The conclusion is that PRT implementation is consistent with positive student outcomes, but this cannot be proven in the current evaluation.

Aside from some procedural issues, such as preventing overdependence on reward, there were few troublesome aspects from the PRT implementation. With its affirming focus on motivation and focus on generalisation of pivotal skills, PRT appears to be a low risk intervention.

Top level recommendations to Aspect were:

- It is feasible to adopt PRT. (This is supported by program fidelity and social validity data, and positive responses from stakeholders).

- PRT implementation was coexistent with positive student outcomes, which suggests that PRT should (continue to be) incorporated into the Aspect Comprehensive Approach for Education (ACAE), especially as it complements other approaches such as TEACCH (Treatment and Education of Autistic and related Communication-handicapped CHildren).

- Parents should continue to be involved in the PRT program.

- During implementation of PRT, documentation should be consistent across classrooms.

- The children's progress and the teaching staffs' dedication under the current evaluation should be celebrated.

- This report should provide the foundation for a joint publication between Aspect and the University of Canberra.

Overall it appears that PRT is a promising approach that is congruent with Aspect's Comprehensive Educational Program (the ACAE).

References

Koegel, R.L., & Koegel, L.K. (2006). *Pivotal Response Treatments for autism.* Sydney: Paul Brookes.

Musti-Rao, S., & Haydon, T. (2011). Strategies to increase behavior-specific teacher praise in an inclusive environment. *Intervention in School and Clinic, July 29*, doi: 10.1177/1053451211414187

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