

THE EFFECTS OF THE PREVENT-TEACH-REINFORCE FOR FAMILIES (PTR-F)
INTERVENTION WITH THREE YOUNG CHILDREN

A thesis in partial fulfilment of the requirement for the Degree of Master of Arts in Child and
Family Psychology

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2018

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List of Abbreviated Terms

ABA – Applied behavior analysis

ABC-PTR – Antecedent-Behaviour-Consequence-Prevent-Teach-Respond

AET – Academic engaged time

ASD- Autism spectrum disorder

ADHD – Attention deficit/hyperactive disorder

ANOVA – Analysis of variance

BAU – ‘Business as usual’

BIP – Behaviour intervention plan

CB – Challenging behaviour

CBCL – Child Behaviour Checklist

CLASS – Classroom Assessment Scoring System

DB – Desirable behaviour

ECE – Early childhood education

ECERS-R – Early Childhood Environment Rating Scale

FBA – Functional behaviour assessment

FCT – functional communication training

IBRST – The individualised behaviour rating scale tool

IOA – Inter-observer agreement

IYPP – Incredible Years Parenting Programme

MoE – Ministry of Education

MOOSES – Multi-Option Observation System for Experimental Studies

ODD – Oppositional defiant disorder

OSCL – Oregon Social Learning Centre

OSEP – Office of Special Education Programmes

PB4L – The Positive Behaviour for Learning school-wide framework

PBS – Positive behaviour support

PCIT – Parent-Child Interaction Therapy

PDD-NOS – Pervasive developmental disorder – not otherwise specified

PMTO – Parent Management Training – The Oregon Model

PTR – Prevent-Teach-Reinforce

PTR-F – Prevent-Teach-Reinforce for families

PTR-YC – Prevent-Teach-Reinforce for young children

RECESS – Reprogramming Environmental Contingencies for Effective Social Skills programme

RCT – Randomised control trial

SEBD – Social emotional and behavioural difficulties

SPSI – Social Pragmatic Storybook intervention

SSBD – Systematic Screening for Behavior Disorders

SSIS – Social Skills Improvement System

SSRS – Social Skills Rating System

SW-PBIS – School-wide positive behaviour individualised support

TARF – Treatment Acceptability Rating Form

Triple P – Triple P – Positive Parenting Programme

Acknowledgements

Firstly, I would like to thank my supervisors, Dr Laurie McLay and Dr Gaye Tyler-Merrick. You have imparted much wisdom, experience, encouragement and guidance to me throughout the year. Laurie, thank you for your willingness to support me part-way through the project and seeing me across the finish line. We made it! Gaye, your passion and excitement continually reminded me of the importance of this project and kept me going.

I would like to acknowledge Suzi Hall for coming in at the last hour. I cannot thank you enough for the time and effort you put in.

I would like to say the hugest thank you to my three families. Truly, without you this project would not have happened. Thank you for allowing me into your lives over the past few months. Your willingness, time commitment and desire to support your children have been humbling. You should all be very proud of your hard work! I will cherish this experience for years to come.

Many thanks go to my family and friends near and far. You have supported me throughout this journey. The hugs, meals, cups of tea, shoulders I have cried on, ears that have listened, words of encouragement and your prayers have meant the world to me.

Lastly, I would like to thank you, Papa. You have been my pillar of strength and biggest cheer leader. I am grateful for the daily reminder that “everything will be ok.” In the midst of disappointment, you always bring hope.

Abstract

Most young children (3-5 years) will engage in challenging behaviour during the first few years of life. However, for some children, their challenging behaviour is persistent, unresponsive to environmental supports and occurs across contexts. Without intervention, young children with challenging behaviour are at an increased risk of detrimental long-term social-emotional and behavioural outcomes such as academic difficulties, poor interpersonal relationships, substance abuse, delinquency, and mental health difficulties. The aim of this project was to investigate the effectiveness of universal home practices and the Prevent-Teach-Reinforce for families (PTR-F) intervention in teaching prosocial social-emotional competence and decreasing persistent challenging behaviour in a New Zealand home setting. The second aim was to investigate the applicability of PTR-F to the New Zealand setting. Using PTR-F procedures, individual families worked collaboratively with the author to assess then implement universal home practices before designing and implementing a function-based individualised behaviour intervention plan. The project used a single-case multi-intervention design across three participants to examine changes in identified targeted challenging behaviour and desirable behaviour across baseline, universal practices, intervention 1 and 2 and follow-up phases. Results indicated that implementing universal home practices alone were not effective but when the function-based individualised PTR-F behaviour plan was implemented positive behaviour change occurred for all three children with reductions in challenging behaviour and increases in desirable behaviour. However there was variability across participants in the extent of the behaviour change. Overall findings also demonstrated that PTR-F is an appropriate behavioural family intervention that is applicable to the New Zealand setting. The overall challenges associated with implementing the PTR-F intervention and the implications of these finds for practice are discussed.

Chapter One

Introduction

Over the years, the research literature has placed an increasing focus on the challenging behaviour (CB) of young children (3-5 years). Educators, researchers, and policymakers are becoming more aware that numerous young children are starting primary school with social-emotional and behavioural challenges. This is particularly problematic as children who do not have social, emotional or language skills are at increased risk of engaging in persistent CB (Doubet, Michaelene, & Ostrosky, 2015; Gremillion & Matel, 2014; Vitiello & Willoford, 2016).

Young children usually engage in CB at some point in the first few years of life. As many as 75% of children exhibit some form of aggressive behaviour by age two (Tremblay, 1999), and approximately 87% of young children have temper tantrums with 64.7% beginning at 2 or 3-years-old (Osterman & Bjorkqvist, 2010). Furthermore, approximately 50% of parents of non-referred 4 to 7-year-olds report non-compliance at home (McMahon & Forehand, 2003). These normative CBs usually dissipate over time, without the need for intervention. For example, Potegal and Davidson (2003) found that the prevalence of tantrums was highest between 2 ½ to 3 years of age, but decreased significantly by 3 ½ to 4 years. Similarly, Osterman and Bjorkqvist (2010) reported that 51.7% of children who had engaged in tantrums no longer engaged in this form of CB after age 5. Notably, for some children, this is not the case. Their CB may continue to persist into their school years and beyond if no intervention is provided (Schuhmann et al., 1998). Indeed, Dunlap et al. (2006) highlights that the single best predictor of later delinquency in adolescents is CB in the preschool years.

Researchers and practitioners have questioned what constitutes the difference between normal misbehaviour and concerning CB in young children (Keenan & Wakschlag, 2002; Wakschlag et al., 2007; Wakschlag, Tolan, & Leventhal, 2010). Maladaptive CBs can be differentiated from developmentally appropriate patterns of behaviour when they are unusually intense, unresponsive to environmental supports or cues, unpredictable or prolonged, destructive, and occur across contexts (Wakschlag et al., 2007). In order to provide direction in differentiating between normal misbehaviour and concerning CB in young children Wakschlag et al. (2010) developed a multi-dimensional model of CB. This included: Temper loss and regulation of anger; noncompliance and the ability to internalise rules; aggression and the ability to control aggressive tendencies; and low concern for others, and the emergence of empathy and moral sense (Wakschlag et al., 2010).

Definition of Challenging Behaviour

Challenging behaviour (CB) in young children has been defined in multiple ways. For instance, Smith and Fox (2003) defined CB as “any repeated pattern of behaviour, or perception of behaviour, that interferes with or is at risk of interfering with optimal learning or engagement in prosocial interactions with peers and adults” (p. 7). Challenging behaviour can include social, emotional and behaviour difficulties (SEBD) which is defined as “behaviours or emotions that deviate so much from the norm that they interfere with the child’s own growth and development and/or the lives of others” (Cooper, 2011, p. 71). CB can also be described in terms of the impact on the individual who engages in CB, for example, Emerson (1995) defined CB as “culturally abnormal behaviour(s) of such an intensity, frequency or duration that the physical safety of the person or others is likely to be placed in serious jeopardy, or behaviour which is likely to seriously limit use of, or result in the person being denied access to ordinary community facilities” (2015, p. 3). In this thesis,

Smith and Fox's definition has been adopted because of the frequency of its use in the child and family literature.

Terminology

A variety of terminology has been used in the literature in reference to CB. Child psychiatrists and psychologists describe children as having *disruptive behaviour disorders* (e.g. oppositional defiant disorder and attention-deficit hyperactive disorder; American Psychiatric Association, 2013) or *externalising problems* (American Psychiatric Association, 2013). In education, children are termed as having *behaviour difficulties* (Church, 2003), *emotional disturbance* (Cloth, Evans, Beckers, & Paternite, 2014) or *challenging behaviour* (Smith & Fox, 2003). Other terms used include *antisocial* (Reid, Patterson, & Snyder as cited in Church, 2003), or *socially maladjusted* (Cloth et al., 2014). For the purpose of this project, the author has chosen to use the term *challenging behaviour*, as it appears to be more acceptable to parents, however, when discussing studies, other terminology may be used (Smith & Fox, 2003).

Prevalence of Challenging Behaviour

Measuring the prevalence of CB in young children is problematic. Church (2003) states multiple factors can influence epidemiological research for the following reasons. Firstly, CB is often broadly defined and thus open to interpretation. As a result, what constitutes normative or CB may be based on individual perception. Therefore, it influences prevalence rates as what one person deems problematic may be different to someone else. Second, all young children engage in some form of CB at one point or another. As previously discussed, what constitutes normative CB, and what behaviour is disruptive and detrimental to their development can be difficult to establish. Third, prevalence varies depending on

where cut-off scores are fixed on rating scales for behavioural frequencies at each age level. High cut-off scores would only identify children with severe CB, excluding children who engage in less severe CB. Fourth, the type of sample influences prevalence rates. For instance, studies with higher sample sizes show more accurate prevalence rates compared to smaller sample sizes. Fifth, approximations are dependent on who acts as the informant; parent/caregiver, teacher or self. De Los Reyes, Henry, Tolan, and Wakschlag (2009) state that there are often discrepancies in information between informants, for example, children displayed more disruptive behaviours in interactions with parents than with researchers. Thus, informant reports are influenced by variations in exhibited disruptive behaviour across environments (De Los Reyes et al., 2009). Lastly, it is possible that social difficulties and environmental factors such as ethnicity, cultural perspectives of behaviour, socioeconomic status, parental stress, family systems, parenting styles, access to knowledge and support about child rearing, and so on, influence reported prevalence rates (Church, 2003; Hattier, Matson, Belva, & Horovitz, 2011).

A recent study with nine preschool teachers conducted by Quesenberry, Hemmeter, Ostrosky, and Hamann (2014) in a midwestern county in the USA, reported that 10-42% of their classroom population engaged in CB. Similarly, Raver and Knitzer (2002) reported that 10% of preschool children engaged in CB and suggested that 4 to 6 percent have severe emotional and behavioural disorders. In New Zealand, three prevalence surveys have been conducted in Canterbury and Otago schools (Bretherton, 1997, 2000; Church, 1996). Results indicate that according to teacher reports, 4.1%-8.4% of Year 1 children (5 year olds) frequently engaged in CB. The prevalence of serious CB among these students, as defined as frequent non-compliance and antisocial behaviour, were between 2.84%-4.55% (Bretherton, 1997, 2000; Church, 1996). These children were considered likely to be developing along a life-persistent antisocial pathway (Bretherton, 1997, 2000; Church, 1996).

Challenging behaviour may continue into school years if no intervention is received. For example, a review of longitudinal studies indicates that 50% of young children with externalising behaviour continued these behaviours into adolescence, with disruptive behaviour showing the greatest amount of persistence (Campbell, 1995). Similarly, Briggs-Gowan et al. (2006) found that 50% of children with elevated rates of parent-reported externalising behaviours at 12- 40 months of age, experienced elevated rates of externalising behaviours one year later. Comparably, there was a 38% chance that children with internalising problems would continue one year later. Children with comorbid problems (i.e. externalising, internalising or dysregulation) were more likely to have CB and social-emotional problems (Briggs-Gowan et al., 2006).

Interestingly, research indicates that males are more likely to engage in CB in early childhood than females (Broidy et al., 2003; Holtz, Fox, & Meurer, 2015; Mesman, Bongers, & Koot, 2001; Moffitt & Caspi, 2001). In the New Zealand population, Odgers et al. (2008) observed that 10.5% of males compared to 7.5% of females were engaging in antisocial behaviour in early childhood that persisted through adolescence. These differences could be attributed to lower rates of symptoms of “nervous system dysfunction, difficult temperament, hyperactivity, reading failure and learning difficulties” in girls compared to boys (Odgers et al., 2008, p. 674).

The prevalence of CB has also been extensively studied across socio-economic groups. Research has demonstrated that CBs are more prevalent among children in low-socioeconomic groups (Del-Homme, Sincliar, Kasari, & Sigman, 1994; Feil, Walker, Severson, & Ball, 2000; Raver & Knitzer, 2002; Samarakkody, Fernando, McClure, Perera, & De Silva, 2012). For example, according to parent report Holtz et al., (2015) found that 17.4% of 1 to 5-year-olds from a diverse urban low-income population (58% African American, 26.1% White, 15.4% Hispanic, 0.5% Other) engaged in CB, with 60% of children

frequently engaging in externalising behaviours. In two cohort studies in Christchurch and Dunedin, New Zealand, Church (1996) and Bretherton (2000) found that schools in low-socioeconomic communities had a percentage three to six times greater of children engaging in CB compared to schools in high socioeconomic communities.

Children with neurodevelopmental disorders, such as an intellectual disability, autism spectrum disorder (ASD), communication or motor disabilities, also engage in CB at higher rates when compared to typically developing children (Davies & Oliver, 2016; Hattier et al., 2011; Ketelaars, Cuperus, Jansonius, & Verhoeven, 2010; King-Dowling, Missiuna, Rodrigues, Greenway, & Cairney, 2015; Long, Gurka, & Blackman, 2008; Petty, Bacarese-Hamilton, Davies, & Oliver, 2014). For instance, research suggests that approximately 94% of children with ASD engage in at least one CB (Matson, Wilkins, & Macken, 2009; Jang, Dixon, Tarbox, & Granpeesheh, 2011). This is generally thought to be the result of deficits associated with each disorder, including intellectual and adaptive functioning, language, gross motor/fine motor skills, social interaction, or impulsivity and inattention (American Psychiatric Association, 2013).

Social and Emotional Development

Social-emotional development is a critical factor in a child's ability to navigate their environment successfully. For most young children, social-emotional development evolves naturally. They learn to develop and maintain intimate relationships with family members, other significant adults and peers; are able to regulate their emotions and soothe themselves if they are upset and convey a vast collection of positive and negative emotions; and have acquired social skills such as sharing, playing alongside others, as well as listening to and following instructions (Cohen, Onunaku, Clothier, & Poppe, 2005).

However, for some children developing social-emotional skills can be difficult. Problems in the acquisition of these skills can be influenced by temperament, detrimental relationships with significant others, parental stress, parent mental health, limited access to information about raising children, parenting practices, parental conflict, or detrimental experiences encountered by the child (Church, 2003; Cohen et al., 2005). Young children who have social-emotional difficulties may engage in CB such as inconsolable tantrums, persistent aggressive or impulsive behaviour, non-compliant behaviour, overactivity, or have little interest or difficulty in playing with others (Cohen et al., 2005). Preventing or improving social-emotional risk factors such as significant relationships, parenting practices, and parental knowledge about child rearing can mitigate CB and adjust a child's developmental trajectory to a more positive one.

Parental Influences on Children's Behaviour

One of the most significant relationships in supporting social-emotional development is the parent-child relationship. This relationship is formed through parent-child interaction over the first few years of life as the child looks to their parent for their basic needs not only physically but social-emotionally, cognitively and spiritually (Bronfenbrenner & Morris, 2006; MacFarlane, 2004). The parent-child relationship forms the foundation for children to establish and maintain relationships with significant others, and navigate and engage in learning opportunities (Bronfenbrenner & Morris, 2006).

There are a number of factors which can determine the characteristics of parent-child interactions, such as child temperament, parental resources or characteristics, social support, parental stress, parental mental health, ethnicity of parents, socioeconomic status, or beliefs about parenting (Belsky, 1984; Farmer & Lee, 2011; Leidy, Schofield, & Parke, 2009). For

young children, parent-child interactions consist of, for example, instruction, imitation, feedback, affect (emotion) quality, and monitoring (Leidy et al., 2009; Tong et al., 2012).

Parenting styles are one such factor that can influence social-emotional development and child behaviour. Parenting styles are attributed to the way parents think, feel and behave towards raising children (Levin, 2011b). Two dimensions of parenting styles were classified by Baumrind (1971, 1989) as authority and affection. Using these dimensions, Baumrind (1971, 1989) developed three parenting styles. Levin (2011a) explains the characteristics of these parenting styles. The ideal parent, the authoritative parent, has high levels of authority and affection. These parents are caring and consistent, have reasonable expectations and demands and provide reasons for such expectations. The second style is the authoritarian parent who is directive and intrusive, with high authority and limited affection. They strictly enforce a lot of rules and are not open to discussing or changing rules. The third parenting style is the permissive parent. These parents display little authority but show a lot of affection. These parents can be lenient, non-direct or unrestricted. Permissive parents are nurturing but take no responsibility in setting and/or maintaining boundaries (Baumrind, 1971, 1989; Levin, 2011a). Maccoby and Martin (1983) identified a fourth parenting style; the uninvolved or neglectful parent, who has little authority and affection. Neglectful parents are unresponsive and cold, and have no rules.

Parenting styles are thought to be associated with positive or negative outcomes. Tong et al. (2012) stated that children whose parents are warm, positively responsive and engaged are expected to be more socially, emotionally and cognitively capable compared to children whose parents are hostile or uninvolved. Decreased parent engagement and inconsistent discipline increases the likelihood that children fail to socialise, putting them at risk of CB and internalising or externalising disorders (Guajardo, Snyder, & Petersen, 2009). In particular, Guajardo et al. (2009) found that overactive parents used repeated, vague and

indirect instructions, which was related to increases in CB. In support, Fettig and Ostrosky (2011) suggested that inconsistent and/or negative parenting behaviours were associated with the development of CB in the early years and predicted continuing problems to school age.

Parenting styles may guide the practices parents use when interacting with their child. These strategies can be positive (i.e. praise, reflection, clear instructions, explaining, redirecting) or punitive (i.e. smacking/hitting, screaming). Parenting strategies and associated outcomes for children are well documented (Gershoff & Grogan-Kaylor, 2016; Knerr, Gardner, & Cluver, 2013; Piché, Huynh, Clément, & Durrant, 2016; Regev, Gueron-Sela, & Atzaba-Poria, 2012). Of note, effective non-violent discipline skills, positive encouragement, and involvement with children are imperative across developmental stages for predicting lower levels of aggression, and are strongly associated with prosocial behaviour in young children (Dishion & Patterson, 2006; Gryczkowski, Jordan, & Mercer, 2017). Punitive strategies are associated with aggressive and antisocial behaviours over time, poorer parent-child relationship quality and deficits in socio-emotional development (Piche et al., 2016). For example, Maguire-Jack, Gromoske, and Berger (2012) found that smacking at ages 1 and 3 years was negatively associated with CB at 3 and 5 years of age. Thus the nature and quality of a child's interaction with their parents are critical factors in their social-emotional development.

Patterson's Coercion Theory. There appears to be a cyclical nature to CB and parent interactions. The transactional nature of relationships, in which environment influences behaviour and behaviour, in turn, influences the environment, can at times be coercive (Patterson, Reid, & Dishion, 1992). For example, a parent who responds to a child's aggressive or non-compliant behaviour inadvertently reinforces the behaviour which then elicits parents to respond, and so on, until the interaction is discontinued when the parent or child "wins". Children engaging in CB who are raised in families that engage in coercive

interactions are more likely to engage in antisocial behaviour in later life (Dunlap et al., 2006). As such, CB does not occur in isolation. Multiple environmental factors impact on children's development and where possible these may need to be addressed to ensure that young children do not engage in CB and as a result have a better start in life.

The Impact of Challenging Behaviour on Child Development

Young children who engage in CB may have detrimental long-term outcomes if their behaviour is not addressed early. Moffitt (1993) identified two developmental pathways of CB into adulthood; *life-course persistent* and *adolescent limited*. While the adolescent limited pathway has onset in adolescence, the *life-course persistent* pathway has an onset in early childhood, with behaviour such as disobedience and aggression evident at 3 to 4 years of age. This life-course persistent trajectory predicts future engagement in dangerous violent behaviour, mental health issues, physical health problems, and economic problems in adulthood. In contrast, the adolescent-limited pathway demonstrated short-term challenging behaviour with little evidence for CB in adulthood (Moffitt, 1993; Odgers et al., 2008).

Challenging behaviour can play a significant part in the diagnosis of developmental psychopathology. Individuals with CB may struggle to control their emotions and behaviours (American Psychiatric Association, 2013; Wichstrom et al., 2012). Interestingly there is a growing epidemiological base demonstrating that psychopathology is evident in young children (Lavigne, LeBailly, Hopkins, Gouze, & Binns, 2009; Wichstom et al., 2012). Dougherty et al. (2015) estimates that about 20% of young children meet criteria for psychiatric disorders. He states that oppositional defiant disorder (ODD) and attention deficit hyperactivity disorder (ADHD) are commonly diagnosed in young children, with rates between 2-17% and 2-13% respectively. Similarly, rates of comorbidity in young children are

comparative to those of adolescents and adults (5-9%). Oppositional defiant disorder is frequently associated with ADHD, anxiety and depression (Dougherty et al., 2015).

If not addressed early, children's CB can be a precursor to later and/or long-term serious behavioural difficulties, such as social and academic difficulties, school drop-out, peer/parent/teacher relationships, adolescent drug abuse, delinquency, and adolescent or adult internalising and externalising problems (Brennan, Shaw, Dishion, & Wilson, 2015; Broidy et al., 2003; Campbell 1995; Capsi, Moffitt, Newman, & Silva, 1996; Church, 2003; Fox, Dunlap, & Powell, 2002; Kolgin & Peterman, 2011; Mesman et al., 2001). Therefore, for young children engaged in CB, it is imperative that they receive support to prevent a detrimental life-course persistent trajectory.

The Impact of Challenging Behaviour on Families

Challenging behaviour can negatively influence the quality of life of the family. Challenging behaviour significantly affects parents, siblings and the wider family unit (DeVore & Bowers, 2006; Dunlap, Ester, Langhans, & Fox, 2006; Fox, Vaughn, Dunlap, & Bucy, 1997; Hoppe, 2005; Hutton & Caron, 2005; Powell, Dunlap, & Fox, 2006; Vaughn, White, Johnson, & Dunlap, 2005). A recent qualitative study by Doubet et al. (2015) demonstrated that children's CB had an impact on restricting family activities, isolated the family from their community, increased family stress levels, negatively affected their parent's belief about their parenting capabilities, and had a negative physical and emotional impact on siblings. Challenging behaviour in young children has also been associated with increased financial stress (Worcester, Nesman, Raffaele Mendez, & Keller, 2008). Such financial pressure may be the result of additional expenses related to needs of the child such as medication, health insurance, gas, food, accessing affordable childcare close-by and difficulties in advancing careers. Lastly, CB negatively impacts the relationships with close

family and wider family members, for example, family members can have different views about how to address this behaviour and/or families may struggle to visit relatives due to the stress of their child's CB (Worchester et al., 2008).

The Impact of Challenging Behaviour on Children's Education

In schools, teacher perceptions and understandings of children's behaviour often influence their behaviour towards their students. Children with CB can be stigmatised by teachers as unwanted, bad, deviant, uncooperative, aggressive or difficult to manage. These labels often develop into 'stories' about the child that may inform other teacher's ideas and expectations about them, and teacher behaviour (MacFarlane, 1997). This stigmatisation can lead to exclusion from school (Broomhead, 2013; Van Acker, Boreson, Gable, & Pooterton, 2005). As such, children with CB potentially have negative teacher-child relationships, receive less teaching instruction, are given more commands by teachers, have scarcer peer-learning opportunities, are less engaged in their environment, and have poorer emergent literacy skills (Arnold et al., 2006; Dobbs & Arnold, 2009). A significant feature of CB is the potential for it to hinder the learning and development of positive social interactions (Smith & Fox, 2003). Undertaking steps to support the child to develop prosocial skills and reducing or eliminate their CB is imperative for their later long-term development.

Theoretical Underpinnings of Effective Interventions

Operant behaviour principles. Behaviour interventions reply on the principles of operant conditioning. Operant conditioning is "the process of and selective effects of consequences on behaviour" (Cooper, Heron & Heward, 2007, p. 33). Kazdin (2001) and Cooper, Heron and Heward (2007) explain that the occurrence of behaviour is contingent on the triggers and environments that occur before behaviour (antecedents), the behaviour itself,

and the response following the behaviour (consequences). The relationship between these three components is known as the ABC's. Consequences play an important role in influencing the likely increase or decrease of behaviour. These consequences are either reinforcing or punishing. Reinforcement *increases* the likelihood of behaviour occurring again when behaviour is immediately followed by a response. Reinforcement can either be positive (i.e. a desirable reward) or negative (i.e. removing an undesirable event or object). In contrast punishment *decreases* the likelihood of behaviour occurring again by presenting or removing an event or object. Positive punishment is the removal of a positive event (i.e. losing a toy or privileges), and negative punishment is when something undesirable is presented after the behaviour (i.e. being told off, time out; Cooper, Heron, & Heward, 1987, 2007; Kazdin, 2001).

Extinction, discrimination and generalisation are three other important principles of operant conditioning. Extinction is the process of *stopping* reinforcement of behaviour in order to decrease the possibility of behaviour occurring again. Extinction can consist of, for example, ignoring behaviour that was previously reinforced by attention and/or no longer giving tangible rewards. Discrimination is when different behaviour occurs in different environments. That is, an individual has learnt that a behaviour that is acceptable in one situation might be unacceptable in another situation, and vice versa. Lastly, generalisation is process of behaviour that has been learnt in one place increases in other environments, despite no reinforcement occurring in the new environment (Kazdin, 2001). Operant behaviour principles are used in the theories and clinical disciplines described below.

Social learning theory. Social learning theory (Bandura, 1977) states that learning occurs in a social context. That is, learning happens through direct social observation, in which an individual will model or imitate the behaviour they have observed in their social environment. Learning is maintained by environmental consequences that serve as

reinforcing or punishing consequences. Behaviour that is reinforced will continue to develop while those with disagreeable consequences will cease.

There are four major components involved in observational learning or modelling. These are attention, retentions, reproduction and motivation (Lyons & Berge, 2012). Lyons and Berge (2012) explain that for learning to occur through observation, individuals must pay close *attention* to the modelled behaviour and be able to remember or *retain* the modelled behaviour, in order to learn from it. Retention can be supported, using visuals, verbal prompts or descriptive language. Observed behaviour has to then be turned into appropriate behaviour through translating retained imagery and language into behaviour that is consistent with observed behaviour. An individual's ability to *reproduce* observed behaviour is dependent on how many opportunities they have to practice the new behaviour. However, if there is no reason to imitate modelled behaviour, an individual will unlikely be *motivated* to take the time or effort to do so (Bandura, 1977; Lyons & Berge, 2012).

For some children, learning the difference between prosocial and CBs can be difficult, particularly when CB is being displayed more often by others, or rewarded more frequently than prosocial behaviour. CBs generally tend to occur more frequently than prosocial behaviour because children have learnt that it serves a purpose for them. That is, their challenging behaviour may be intentionally or unintentionally positively reinforced. Therefore, the theory of applied behaviour analysis (ABA) is helpful in understanding when, where and why behaviour occurs, and providing strategies to decrease challenging behaviour and increase prosocial behaviour across contexts.

Applied behaviour analysis. Applied behaviour analysis (ABA) is a clinical discipline that employs learning and behaviour principles to increase desirable behaviour and reduce CB (Cooper, Heron, & Heward, 1987, 2007; Fisher, Groff, & Roane, 2011; Kazdin, 2001). The aim of ABA is to replace CB with prosocial behaviours that are identified as

important to the individual and his or her family (Fisher et al., 2011). As behaviour occurs in social environments and is maintained by its consequences, ABA strives to understand the function of the behaviour by assessing the antecedents and consequences of behaviour. Once the function of behaviour is understood, ABA uses evidence-based behaviour techniques to change the environmental triggers in order to produce behaviour change that is generalizable over time. To assess whether behaviour techniques are effective, ABA places an emphasis on measuring the changes in behaviour through direct observation, objective measurement and quantification (Cooper, Heron & Heward, 1987, 2007). Applied behaviour analysis provides the theoretical foundation for positive behaviour support (Carr et al., 2002).

Positive behaviour support. Drawing from ABA, positive behaviour support (PBS) has been adopted since the mid-1980s as an approach to behaviour support, education and disability. PBS is based upon an ecological model focused on improving the quality of life of individuals (Carr et al., 2002). PBS is defined as:

An approach to behaviour support that includes an ongoing process of research-based assessment, intervention, and data-based decision making focused on building social and other functional competencies, creating supportive contexts, and preventing the occurrence of problem behaviours. PBS relies on strategies that are respectful of a person's dignity and overall well-being and that are drawn primarily from behavioural, education, and social sciences, although other evidence-based procedures may be incorporated. PBS may be applied within a multi-tiered framework at the level of the individual and at the level of larger systems (e.g., families, classrooms, school, social service programs, and facilities) (Kincaid et al., 2016, p. 3).

PBS works in the following ways: (1) it focuses on enhancing the quality of life of individuals/families through teaching practical and adaptive skills to be used in the daily

contexts of home, school or the community; (2) PBS is committed to improving CB without using negative strategies. Instead, PBS focuses on decreasing CB by using positive strategies and teaching pro-social skills (Carr et al., 2002; Dunlap, Iovannone, Wilson, Kincaid, & Strain, 2010); (3) it targets issues of inclusion, friendship and engagement in communities (Kincaid et al., 2016). For young children, their CB may affect the extent to which they are included, engage in opportunities or treated with respect (Culham & Nind, 2003); (4) PBS aims to work in collaboration with parents/caregiver, teachers, and others supporting the individual, empowering them to be the main interventionist. Thus the specialist acts as a facilitator, assisting significant people who interact daily with the child; and (5) PBS highlights that multiple ways to approach assessment, intervention or problem-solving. Instead, a number of strategies can be applied to ensure intervention is applicable in the environment in which behaviour occurs; fits well with family values, and the child; and are practical, desirable and are appropriate for the environment in which they are implemented (Carr et al., 2002; Kincaid et al., 2016). A number of evidence-based PBS strategies have been developed and have demonstrated their effectiveness in decreasing CB and increasing desirable behaviour (DB) in home (Binnendyk & Lucyshyn, 2009; Blair, Lee, Cho, & Dunlap, 2011; Clarke, Dunlap, & Vaughn, 1999; Duda, Clarke, Fox, & Dunlap, 2008; Fettig & Barton, 2014; Lucyshyn et al., 2007), community (Lucyshyn et al., 2007; Vaughn, Wilson, & Dunlap, 2002), and classroom and schoolwide environments (Blair, Fox, & Lentini, 2010; Blair, Lee, Cho, & Dunlap, 2011; Chu, 2015; Peterson, Caniglia, & Royster, 2001; Tobin & Sugai, 2005). An intervention which is derived from social learning theory, applied behaviour analysis and positive behaviour support is the Prevent-Teach-Reinforce intervention (PTR; Dunlap, Iovannone, Kincaid, Wilson, Christiansen et al., 2010).

Functional behaviour assessment. Functional behaviour assessment (FBA) is founded on ABA principles and is used in PTR (Dunlap, Iovannone, Kincaid, Wilson,

Christiansen et al., 2010). The process of FBA involves collecting data and information on the antecedents, behaviour and consequences in order to understand why CB occurs. In doing so, FBA helps us to determine the function or functions of the behaviour (Gresham, Waston, & Skinner, 2001). FBA processes may differ slightly, however all FBAs (a) identify a target behaviour, what the behaviour looks like, and where the behaviour occurs; (b) gather data and information (i.e. behaviour diaries, measure frequency, intensity and/or duration), including information on the antecedents and consequences that precipitate and result from the behaviour; and (c) generate a hypothesis statement about the possible function(s) of the CB (Frey & Wilhite 2005; Gresham et al., 2001; Umbreit, Lane, Liaupsin & Lane, 2007). The function of behaviour varies with each child and environment. Typically, CB is used to gain attention, escape an undesirable task or environment, obtain a desirable item or activity or meet a sensory need (Frey & Wilhite, 2005). The outcome of the FBA is used to form a behaviour intervention plan (BIP). Plans focus on changing environmental triggers (antecedents) and responses (consequences), and teaching replacement prosocial skills that achieve the same function as the CB, with the aim of producing positive behaviour change (Chandler, Dahlquist, & Repp, 1999; Dunlap & Fox, 2011; Moreno, 2011).

A large number of family-centred studies have used FBA procedures to identify antecedents, behaviour and consequences to inform intervention (Binnendyk & Lucyshyn, 2009; Blair et al., 2011; Cheremshynski, Lucyshyn, & Olson, 2012; Duda et al., 2008; Dunlap, Ester, Langhans, & Fox, 2006; Dunlap & Fox, 2009; Durand, Hieneman, Clarke, Wang, & Rinaldi, 2012; Fettig & Ostrosky, 2011; Fettig, Schultz, & Sreckovic, 2015; Galensky, Miltenberger, Stricker, & Garlinghouse, 2001; Moes & Frea, 2000). However, studies differ in how FBA information informs intervention, particularly in terms of which components of behaviour intervention focuses on (i.e. antecedents, consequences and replacement behaviour). A recent review (Fettig & Barton, 2014) demonstrated that the

majority of parent implemented function-based interventions incorporated strategies for two components (i.e. antecedent and consequences). However, some studies also incorporate teaching prosocial replacement behaviour (Dunlap & Fox, 2009; Duda et al., 2008; Lucyshyn et al., 2007).

Results of family-centred studies are promising, demonstrating that FBA based PBS interventions successfully decrease CB and increase desirable behaviour (DB) for typically developing young children and young children with disabilities (Binnendyk & Lucyshyn, 2009; Blair et al., 2011; Cheremshynski, et al., 2012; Chu, 2015; Duda et al., 2008; Dunlap & Fox, 1999; Dunlap, Ester, Langhans, & Fox, 2006; Durand et al., 2012; Fettig & Barton, 2014; Fettig & Ostrosky, 2011; Fettig et al., 2015; Galensky et al., 2001; Lucyshyn et al., 2007; Moes & Frea, 2000; Vaughn et al., 2002). Long-term positive social outcomes have also been reported. For example, Lucyshyn et al. (2007) noted that at a seven year follow-up, not only had behaviour change been maintained and generalised, intervention had a positive impact on quality of life outcomes for the child and her family. In particular, they were able to participate in more community activities, and willingly access family/community support. Likewise, intervention decreased parental stress, anxiety and depression, and increased opportunity for parent employment, and parenting confidence.

Conducting FBAs and implementing intervention in the natural environments in which CBs occur, such as home/community, has been demonstrated to be effective in increasing DBs and decreasing CBs (Blair et al., 2011; Galensky et al., 2001; Moes & Frea, 2000; Lucyshyn et al., 2007; Vaughn et al., 2002). Several studies lend support to the need to address CB in multiple environments at once (i.e. school and home) and the importance of collaboration between multiple stakeholders (i.e. teachers, parents and practitioners; Blair et al., 2011; Chu, 2015). By working in the child's natural environments, practitioners and parents are able to work in collaboration to design and implement function-based behaviour

support plans that take into account the families' needs, cultural values and beliefs, and practicalities of daily life (Chu, 2015; Cheremshynski et al., 2012; Duda et al., 2008; Vaughn et al., 2002). In one study, Moes and Frea (2000) compared the child and family outcomes of two function-based intervention plans; one created by practitioners only (prescriptive), and the other, family-centred (contextualised). A family of a 3-year-old male with autism who engaged in disruptive behaviour took part. After identifying CB, selecting routines, recording baseline data and an FBA assessment, the authors designed the prescriptive BIP. This had two phases; 1) Functional communication training (FCT; "break please") and escape extinction; and 2) demand fading. Parents were coached on intervention strategies and began implementation. The prescriptive intervention was carried out over 14 sessions. The family then completed a family context assessment and created a contextualised BIP in collaboration with authors. The contextualised BIP adapted the prescriptive BIP, taking into account information from the family context assessment and family preferences. Specifically, the contextualised BIP eliminated escaped extinction and demand fading, introduced reinforcement, and changed the FCT ("help please") and how this was implemented. These changes were made to correspond to the families expectations of the child, allow parental assistance and improve interactions. In addition, an older sibling participated in the contextualised intervention as a peer-model. Parents implemented the contextualised BIP for six sessions. Moes and Frea (2000) found that the family-centred function-based approach provided greater behaviour change compared to the practitioner only approach. Behaviour change was maintained at follow-up three months later. Moreover, social validity results reflected the improvement in behaviour change from the prescriptive to the contextualised intervention. Mother and father social validity ratings increased from 3.1 and 3.3 to 3.9 and 3.8 respectively for the contextualised intervention. The results of this study indicated that the collaborative intervention processes are more suitable to the family context and resulted in

greater improvements in behaviour outcomes compared to the intervention that did not incorporate family collaboration.

Additionally, Fettig and Ostrosky (2011), Lucyshyn et al. (2007), Dunlap and Fox (1999), and Duda et al. (2008) have shown that when parents are coached in positive strategies they effectively become the main interventionists, implementing function-based strategies reliably and as a result, improving their child's behaviour.

Interventions for Children with Challenging Behaviour

Early intervention. Early intervention has shown to be effective for families of children who are engaging in CB (Dunlap & Fox, 2011). Challenging behaviour becomes more problematic the longer a child engages in it and thus it becomes more difficult to produce change. Early recognition is essential to effective early intervention (Dunlap & Fox, 2011; Duda et al., 2008; Long et al., 2008). However, as previously discussed, identifying young children's CB is often difficult.

Fox, Dunlap, and Cushing (2002) propose four foundations for effective early intervention. These are family centeredness, collaborative partnership with families and practitioners, assessment-based PBS and positive involvement in inclusive settings. The aim is to promote families' capabilities and self-assuredness by providing guidance and support to improve behaviour and ensure children have the necessary prosocial skills to navigate multiple situations (Fox, Dunlap, & Cushing, 2002). Research has shown that child-centred and family-focused interventions have long term success in improving young children's behaviour (Lucyshyn et al., 2007). Blair et al. (2011) and Chu (2015) highlighted that family-centred interventions support families to make positive improvements in their child's behaviour and enhance parenting capabilities. Fox, Dunlap, and Cushing (2002) stated that, a professional-parent partnership is imperative to ensure that interventions are using the

expert knowledge that professionals and parents bring. Additionally, by involving parents in all aspects of intervention processes, families gain an understanding of strategies that may promote additional behaviour change outside of intervention (Blair et al., 2011; Fox, Dunlap, & Cushings, 2002; Lucyshyn et al., 2007).

Response to Intervention Model. A variety of interventions for families and educators have been designed to provide support for children's CBs dependant on the intensity of support needed. The strength of intervention is categorised into three tiers. Tier I are universal programmes that cater to all children, families and schools. For example, the Triple P- Positive Parenting Programme (Level 1; Sanders, 1999), School-wide positive behaviour support (Sugai & Horner, 2002) and Incredible Years teacher classroom management (Webster-Stratton, Reinke, Herman, & Newcomer, 2011). Tier II supports groups of children who engage in problem behaviours by providing intensive "booster" interventions. For example, the Parent Management Training- The Oregon Model (PMTO; Patterson, 2005; Patterson & Gullion, 1968), Triple P (Level 4), Incredible Years Parenting Programme (IYPP; Webster-Stratton, 2011), First Step to Success (Walker et al., 1998), Check In/Check Out program (Fairbanks, Sugai, Carter, & Dickey, 2007), the Behaviour Education Program (Crone, Horner, & Hawken, 2004) and Check, Connect and Expect (Cheney et al., 2009). Tier III focuses on children with CB whose behaviour does not improve with universal and secondary interventions, and thus are in need of intensive individualised intervention at home, school or in the community. For example, Triple P (Level 5), IYPP advanced (Webster-Stratton, 2011; The Incredible Years, 2017), Parent-Child Interaction Therapy (PCIT; Eyberg, 1988), Prevent-Teach-Reinforce for families (Dunlap et al, 2017), Reprogramming Environmental Contingencies for Effective Social Skills programme (RECESS; Walker, Hops, & Greenwood, 1981), Prevent-Teach-Reinforce (Dunlap, Iovannone, Kincaid, Wilson, Christiansen et al., 2010; Dunlap, Wilson, Strain, &

Lee, 2013). Interventions within all tiers are evidence-based, person-centred, with Teir III interventions specifically focus on the function of CB (Office of Special Education Programmes [OSEP] Technical Assistance Centre on Positive Behavioral Interventions and Supports, 2017).

Parenting Programmes. For parents and families, accessing information and support can be a difficult, long-winded and a stressful process. Worchester et al. (2008) found that parents have difficulty acquiring useful and accurate information from service providers. These difficulties were reportedly due to logistical issues, professional practice and professionals understanding of concerns. For example, one mother expressed how stressful conversations with her child’s service coordinator were, describing that she had to fight to get everything her child needed and produce evidence to validate decisions (Worchester et al., 2008). While supports and services are supposed to act as change agents for families, it is possible that not all supports and services reach this goal. However, there are some parenting programmes that aim to support families of children with CB. Four effective family-based interventions are: (1) PMTO (Patterson, 2005; Patterson & Gullion, 1968); (2) PCIT (Eyberg, 1988); (3) Triple P (Sanders, 1999); and (4) IYPP (Webster-Stratton, 1996; *The Incredible Years*, 2017). These intervention programmes will be outlined below.

Parent Management Training – The Oregon Model (PMTO). Based on their extensive research the Oregon Social Learning Centre (OSCL) developed the Parent Management Training program to support parents of children with conduct problems (Patterson & Reid, 1975). With its foundation in social interaction learning (Patterson, 2005), PMTO focuses on preventing and reducing children’s CB and improving prosocial behaviour. PMTO aims to do this by improving five core skills; “limit setting and discipline, monitoring and supervision, problem-solving, positive involvement and skill encouragement” (Forgatch

& Kjobli, 2016; Ogden & Hagen, 2008, p. 608). These skills are taught through a manually based program carried out in a variety of settings and using various modalities (i.e. group setting, individual setting, via phone/ video). The service type informs the number of sessions needed, ranging from six to 25 sessions, with group sessions averaging 12 weeks (Dishion, Forgatch, Chamberlain, & Pelham, 2016; Kjobli, Hukkelberg, & Ogden, 2013). Their teaching-learning process consists of lectures, role-play and problem-solving exercises, and home assignments within collaborative sessions to promote parent change (Dishion et al., 2016; Forgatch & Kjobli, 2016; Kjobli et al., 2013). PMTO has been adapted for multiple cultures (e.g. Iceland, Norway, Canada, USA, Denmark, Mexico, The Netherlands and Uganda) and populations such as low socio-economic status populations, clinically referred families, single mothers, parents with children in care, military families, and war-displaced families (Forgatch & Kjobli, 2016). Research evidence suggests that PMTO decreases noncompliance, divergent behaviour, aggression, parental depression, and detrimental parenting; and increases positive parenting, parental marriage relationships, annual income and socioeconomic status (Dishion et al., 2016).

Parent-Child Interaction Therapy (PCIT). PCIT is a short term, evidence-based parent training intervention programme based on social learning theory and attachment theory. PCIT aims to improve dysfunctional parent-child interactions by supporting parents to build positive relationships with their child, become more confident in their behaviour management and develop effective communication habits using elements of behavioural and child-play therapy (Eyberg, 1988). PCIT involves two stages; (1) child-directed interaction aimed at improved the relationship between child and parent through positive communication during child-initiated play; and (2) parent-directed interaction phase involves parents engaging with their child by leading activities, providing instructions and applying suitable

consequences for CB (Ward, Theule, & Cheung, 2016). Research has shown that PCIT reduces CB and improves positive parenting skills (Thomas & Zimmer-Gembeck, 2007).

Triple P -Positive Parenting Programme. Triple P is the only evidence-based multilevel parenting programme designed as a public health approach (Sanders, 2010). Triple P focuses on providing preventative interventions for families of 0 to 16-year-olds through a variety of service types to accommodate different needs and choices of families (Arkan, Ustun, & Guvenir, 2013). It aims to enhance parent-child relationships and develop positive parenting skills, particularly around CB and emotional behaviour in children in order to improve children's social, emotional, language, academic and behavioural development; increase parent confidence; and promote a nurturing, safe and engaging environment for children (Sanders, 1999). A strong cross-cultural evidence base shows Triple P is effective in decreasing problem behaviour while increasing social, emotional and academic development. For parents, Triple significantly decreases parental stress, anxiety, depression, and increases parent's ability to cope with challenging behaviours effectively. It also has high parent acceptability (Arkan et al., 2013; Furlong et al., 2012; Thomas & Zimmer-Gembeck, 2007).

The Incredible Years Parenting Programme (IYPP). A programme with a strong evidence base is IYPP. Created by Carolyn Webster-Stratton in the early 1980's, IYPP is a preventative programme for families of children at risk of conduct problems, with its foundation in attachment theory and social learning theory (Webster-Stratton, 2011). IYPP consists of five BASIC group-programmes for parents of children from zero to 12 years, along with programmes for teachers and children (Webster-Stratton, 2011; The Incredible Years, 2017). IYPP aims to empower parents by strengthening parent-child relationships, encouraging child cooperation, teaching positive parenting and communication skills, introducing effective limit setting and promoting positive discipline skills (Webster-Stratton,

1991, Ogden & Hagen, 2008; Arkan et al., 2013; Kjobli et al., 2013). IYPP uses videotaped vignettes to demonstrate targeted skills which can be applied to each family's context (Pidano & Allen, 2015). Parents and educators collaboratively discuss videos, practice strategies through role-play, problem solve and complete homework assignments (Arkan et al., 2013; Gardner & Leijten, 2017). IYPP has shown to decrease CB in children, decrease negative parenting practices, improve positive parenting skills, decrease parental stress, and depression. IYPP has high social validity, and is culturally sensitive and cost effective (Arkan et al., 2013; Barlow, Smailagic, Huband, Roloff & Bennett, 2014; Furlong et al., 2012; Leijten et al., 2017; Menting, Orobio de Casto, & Matthys, 2013; Pidano & Allen, 2015).

The New Zealand Context

The Ministry of Education (MoE) provides the Incredible Years programmes for parents of children (3-8 years) with CB. Parents meet once a week over 14 weeks and focus on improving parent-child interactions, DB and positive behaviour management skills (Ministry of Education, 2016). A New Zealand pilot study conducted by Sturrock and Gray (2013) investigated whether IYPP would have similar or dissimilar outcomes for Māori and non-Māori populations. The results found that challenging behaviour, parenting skills and parent-child relationships significantly improved with effect sizes similar to the international literature. Median effect sizes ranged from $d = 0.48$ (relationships), $d = 0.54$ (parenting skills) to $d = 0.65$ (child behaviour). While improvements were broadly similar for non-Māori and Māori parents, at six months follow-up non-Māori had slightly higher improvement in children behaviour and punitive parenting practices compared to Māori. However, these slight differences in child behaviour, parenting practices and family relationships between Māori and non-Māori were not evident at 30-month follow-up. Overall at 30-month follow-up, improvements in child behaviour, parenting practices and family relationships were

maintained (Sturrock, Gray, Fergusson, Horwood, & Smits, 2014). It seems that in general IYPP is an effective programme for Māori and non-Māori families alike with long-term benefits across multiple outcomes.

Limitations of Parenting Programme

While interventions such as PMTO, PCIT, Triple P, and IYPP have their merits, there are also a number of limitations that must be considered. Firstly, programmes like Triple P take a public health approach in aiming to reach *all* families and children. However, children with persistent challenging behaviour may not respond to universal approaches and need additional individualised support. A meta-analysis of Triple P showed that while effective, its group or self-directed format have lower effect sizes on improving challenging behaviour, while individual delivery is more effective (Nowak & Heinrichs, 2008).

Secondly, it is also necessary to consider the relevance of parenting programmes across cultures. Although beliefs around parenting practices vary across cultures, the foundational values of positive parenting programmes are strong cross-culturally. However, it appears that some parenting programmes do better than others in adapting their programme to respect and strengthen cultural values and customs and address the needs of diverse cultural groups (Arkan et al., 2013). For example, IYPP uses video presentations. This style of learning may not be suited to all parents. Indeed, Knapp and Deluty (cited in Arkan et al., 2013) found that parents with low socio-economic incomes found the video method effective while a parent with intermediate socio-economic level did not. In contrast, Triple P's educational content is delivered through multiple teaching methods such as groups, seminars/conferences, modelling, role-play, feedback, rehearsal, and video presentation (Arkan et al., 2013). Parenting programmes which cater to different learning styles may acknowledge and value these differences in culture more successfully.

Third, group parenting interventions such as Triple P, PMTO and IYPP often have high attrition rates (Amrahamse, Niec, Junger, Boer, & Lindauer, 2016; de Graaf, Speetjens, Smit, de Wolff, & Tavecchio, 2008; Fernandez & Eyberg, 2005; Arkan et al., 2013). For example, Triple P has a drop-out rate between 5%-44%, while IYPP range from 10%-50% (Arkan et al., 2013). Similarly, Gardner and Leijten (2017) state that there is much variation in outcomes across families who participate in IYPP and only about one-third of families do not benefit or benefit only modestly. There are a number of dynamic and static factors that influence high attrition rates and outcomes such as genetic factors, parental relationships with facilitators, difficult school situations, current family situations (e.g. death of family member), socio-economic factors, marital status, parenting stress, child age, maternal levels of internalizing symptoms, caregiver prosocial behaviour and severity of child behaviour (Amrahamse et al., 2016; Gardner & Leijten, 2017; Fernandez & Eyberg, 2005; Werba, Eyberg, Boggs, & Algina, 2006). Therefore, there appears a need for personalised interventions which could potentially moderate high attrition rates.

Fourth, it appears that programmes such as Triple P and IYPP have minimal focus on improving DB, with greater emphasis being placed on decreasing CB (Nowak & Heinrichs, 2008). As such, a need for positive behaviour interventions which focuses on building the social competence of children, instead of primarily focusing on their CB has led to PBS interventions.

Fifth, a barrier to intervention programs is the cost of materials and the cost of becoming a certified facilitator. For many services, the time and money required for certification might not be reasonable due to budget restraints, particularly for low and middle income earners (Gardner & Leijten, 2017). Some programmes, such as Triple P and IYPP are making progress in providing their programmes online to eliminate barriers to access and

participation (Morawska, Tornetzi, & Sanders, 2014; Sanders, Baker, & Turner, 2012; Sourander et al., 2016).

Finally, while it appears that behaviour improvement is maintained at follow-up, there is little conclusive evidence of long-term outcomes and it appears that generalising improved behaviour to other situations or contexts is difficult (Arkan et al., 2013; Furlong et al., 2012; Thomas & Zimmer-Gembeck, 2007). There is the need for additional studies to be performed to establish long-term outcomes and generalisability of parenting programmes.

School-wide and Centre-wide Behaviour Intervention

Understanding and responding to CB is one of the biggest challenges for teachers working in early childhood education (ECE) and schools (Quesenberry et al., 2014). In recent years, ECE and schools have begun addressing CB by using school-wide and centre-wide approaches. One example is the School-wide Positive Behaviour Interventions and Support (SW-PBIS). SW-PBIS aims to prevent challenging behaviour through changing whole school or district behaviour management systems. In the United States of America, 25,911 schools use the SW-PBIS framework (OSEP Technical Assistance Centre on Positive Behavior Interventions and Supports, 2017). This model uses the three-tiered framework Response to Intervention Model described above to support all children. SW-PBIS interventions have a large evidence-base supporting their effectiveness (Horner, Sugai, & Lewis, 2015)

An extension of the tiered framework has been developed to enhance social-emotional competence and prevent CB of young children in the early childhood context (Fox, Dunlap, Hemmeter, Joseph, & Strain, 2003). The Pyramid Model consists of four tiers with each tier associated with evidence-based strategies that are developmentally suitable and intended to be used in different classroom settings (refer to Figure 1).

In particular the Pyramid Model identifies that for positive social-emotional development to occur young children need to be in supportive environments with warm responsive relationships. The Pyramid Model focuses on peer-related interactions, social problem solving, identifying and managing emotions and family engagement. The intensity to which these are promoted is dependent on the child needs (Technical Assistance Centre on Social Emotional Intervention for Young Children, 2011). For example, at Tier III, teachers use evidence-based social-emotional teaching strategies for young children with social-emotional delays or are in danger of developing CB (Dunlap & Fox, 2011). For children who need additional support (Tier V), a function-based individualised BIP is designed in collaboration with teachers and families (Allen & Steed, 2016; Fox et al., 2003; Hemmeter, Ostrosky, & Fox, 2006; Hemmeter, Snyder, Fox, & Algina, 2016; Iovannone et al., 2009).

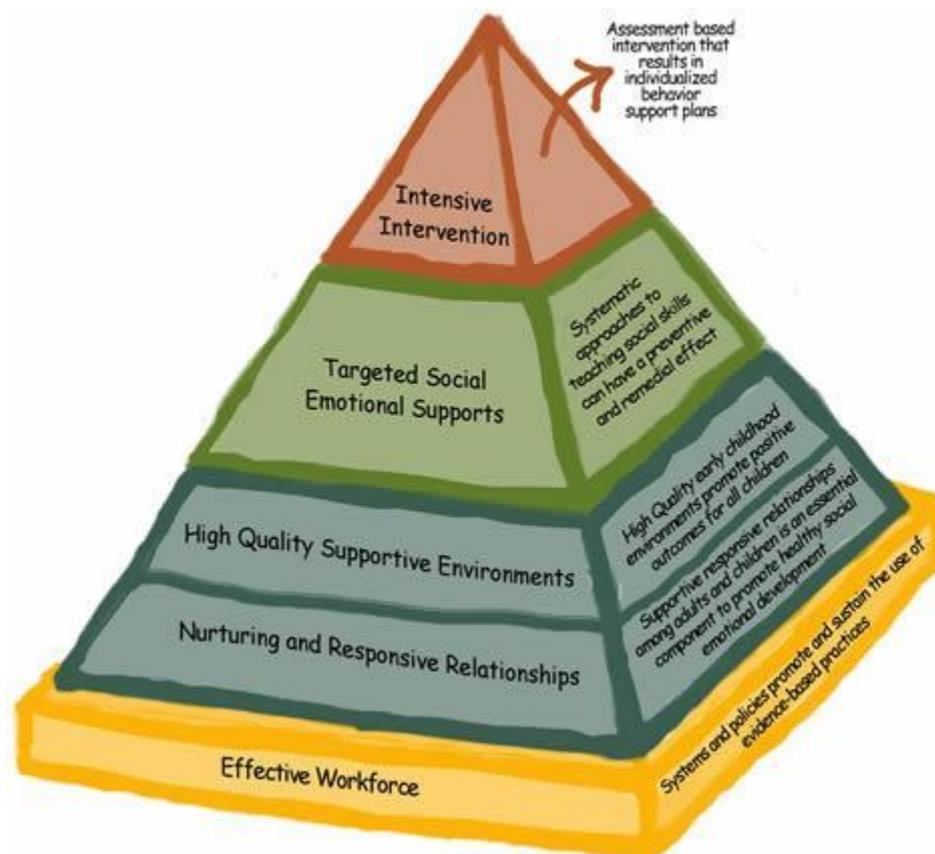


Figure 1: Pyramid Model for promoting social emotional competence in infants and young children. Technical Assistance Centre on Social Emotional Intervention for Young Children (2011).

In New Zealand schools, the MoE (2016) use The Positive Behaviour for Learning school-wide framework (PB4L) for early childhood. This has been adapted from the SW-PBIS model for New Zealand schools. Incorporated into PB4L at Tier II, is the Incredible Years programme for teachers and parents to support the decrease of CB and create a more positive learning environment at school, early childhood centre and at home (Ministry of Education, 2016).

Limitations of School-wide Interventions

While school interventions aim to increase pro-social skills and decrease CB for individual children, there are limitations to individual behaviour supports. There are concerns about the ability of school staff to design and implement FBA/BIP properly. Scott et al. (2005) and Van Acker et al. (2005) found the majority of FBA/BIPs had flaws in one or more critical areas and were not adequately and successfully implemented. The most common mistakes were the failures to identify or define target behaviour, identify a function of behaviour and basing intervention strategies on the function of behaviour, provide information on the frequency and/or seriousness of the behaviour, and provide information to verify the proposed hypothesis. Similarly, strategies in BIPs were problematic. A large number of plans failed to incorporate teaching of replacement behaviours, select appropriate positive strategies, or exclude ineffective strategies used previously (Scott et al., 2005; Van Acker et al., 2005). There was also little consideration in regards to follow-up and evaluation of interventions, monitoring implementation, maintenance of behaviour change or generalisation (Iovannone et al., 2009; Scott et al., 2005; Van Acker et al., 2005).

To address concerns in the use of FBA processes in schools, PTR was developed to provide a manualised model for intervention planning that could be used reliably and effectively by teachers (Iovannone et al., 2009; Dunlap, Iovannone, Kincaid, Wilson,

Christiansen et al., 2010). Over the years, PTR has been adapted for early education environments (Dunlap et al., 2013) and most recently, home and community environments (Dunlap, Strain, Lee, Joseph, Vatland, & Fox, 2017).

Prevent-Teach-Reinforce Intervention

Prevent-Teach-Reinforce is a manualised individualised positive behaviour support intervention that uses ABA and positive behaviour support principles. PTR is a Tier III intervention, however, the authors (Dunlap et al., 2013; Dunlap, Strain, Lee, Joseph, Vatland, & Fox, 2017) highlight that for behaviour change to occur effectively, universal practices in the home or classroom need to be assessed and strategies put in place if they are not being used at all or used effectively. Once implemented, universal practices may lead to greater improvements in behaviour and there may not be the need for individualised interventions. Universal practices may also act as a spring board from which individualised strategies can be used effectively (Dunlap et al., 2013; Dunlap, Strain, Lee, Joseph, Vatland, & Fox, 2017).

The three underlying assumptions of PTR are:

- 1) Challenging behaviour is an inappropriate form of communication. That is, CB serves the same purpose as more acceptable ways to communicate, such as talking, nonverbal gestures or facial expressions;
- 2) Challenging behaviour is sustained due to environmental consequences, such as attention from others, a desirable object or escape from an undesirable activity or situation, and;
- 3) Challenging behaviours occur at different frequencies or intensities in different environments (Dunlap et al., 2013, p. 5-6; Dunlap, Strain, Lee, Joseph, Vatland, & Fox, 2017, p. 2-3).

PTR states that the child's family play a crucial role in the development and implementation of intervention, acting as natural change agents. Therefore, PTR is a collaborative team-driven, problem-solving programme that emphasises respect for the culture, values, traditions and perspectives of the family. PTR is applied in the context in which the CB takes place, providing assistance to make sure that children with CBs have opportunities to regularly interact with peers who have already developed necessary socio-emotional skills and prosocial relationships (Dunlap et al., 2013; Dunlap, Strain, Lee, Joseph, Vatland, & Fox, 2017).

The PTR process is implemented using five key steps: 1) establishing a team and goal setting, 2) data collection, 3) functional behaviour assessment, 4) intervention, and 5) using data and next steps (Dunlap, Iovannone, Kincaid, Wilson, Christiansen et al., 2010; Dunlap et al., 2013; Dunlap, Strain, Lee, Joseph, Vatland, & Fox, 2017). These steps are outlined below.

Step One: Establishing a team and goal setting. This step consists of holding an initial meeting with important people in the child's life. At home, this could include parents, caregivers, siblings, extended family members, or support workers. This meeting varies in length between 30 minutes to one hour. It involves arranging the roles and responsibilities of each person, agreeing on a long-term goal, developing short-term goals and defining the target behaviour. A long-term goal focuses on what each team would like the child to learn or achieve in the long-term. Short-term goals are steps towards achieving this long-term goal. The short-term goals focus on the CB that the team wishes to decrease and DBs the team wish to increase. Short-term goals should be achievable in two to three months. To identify short-term goals, the team brainstorms what CBs exist and what DBs they would like to see the child exhibiting. Each team identifies one CB and one DB as the focus for intervention.

Teams define behaviour in operational terms so that behaviours can be observed and measured.

Step Two: Data collection. This step involves meeting together as a team to develop a system for collecting data. This usually takes place within a few days of the first meeting or can be combined with step one. Data collection methods can include frequency counts, individualised behaviour rating scale tool (IBRST) scores, functional behaviour assessment (FBA) and direct observations. The researcher helps guide teams to determine which type of data collection is more appropriate; frequency counts or IBRST. They jointly decide on when the behaviour is occurring and when it is not. The period of time when the behaviour occurs is to be measured using their chosen system. Teams also discuss who will collect and summarise data. Teams collect data using their chosen system for at least five days or until the data is representative of a typical day with minimal variability.

In an initial study on the efficacy of IBRST, Iovannone et al. (2009) demonstrated that between teacher and data collectors, the IBRST had the potential for being reliable in classroom settings across time and across behaviours. Likewise, Bailey and Blair (2015) used the IBRST in their in-home study. They found that all of the mothers correctly completed the IBRST each day across baseline, intervention and follow-up phases. The mother's ratings were comparable to data taken by the researcher (Bailey & Blair, 2015).

During this phase, the team also assesses their implementation of evidence-based universal practices in the home or classroom. Teams will assess the manner in which they are using these strategies, and identify which strategies they may need to begin implementing or improve their use. In the home setting, there are four universal practices that can lead to improved behaviour. Dunlap, Strain, Lee, Joseph, Vatland, and Fox (2017) describe universal home practices as follows:

- 1) Provide high rates of positive attention and acknowledge occasions in which the child is behaving appropriately, and in which parents spend the majority of time focusing on positive behaviour instead of CB;
- 2) Establish and maintain a predictable daily routine, which provides children with the ability to expect what comes next;
- 3) Develop consistent routines within the daily routine, which again provides children with predictability in routines and allows the child to play an active role in daily routines; and
- 4) Teach behavioural expectations, in which children know what is appropriate and inappropriate behaviour and boundaries at home (Dunlap, Strain, Lee, Joseph, Vatland, & Fox, 2017, p. 20-21).

During this phase, each team also completes an individualised FBA to inform assessment and intervention. The FBA involves three checklists which correspond to the three elements of the PTR model – prevent, teach, reinforce. The *prevent* checklist includes questions on events or circumstances in the environment that act as triggers or influence the CB, as well as circumstances in which CB does not occur. The *teach* checklist has questions focusing on the purpose or function of behaviour and potential replacement behaviour children can learn, such as social, communicative and problem-solving skills. The *reinforce* checklist has questions about the events, items, people and activities that act as consequences to CB and assists in identifying potential reinforcers that could encourage the child to engage in DBs. The FBA process is discussed in the second meeting.

Following the second meeting, the researcher will visit the environment in which the intervention is targeted, i.e. home or community at least once to directly observe the child's behaviour to ensure the team is measuring behaviour correctly. During observations, the researcher will also take notes on triggering events, behaviours and reinforcers to inform

intervention. Intervention goals and target behaviours may be altered if the behaviours observed are inconsistent with the behaviours defined in the first two meetings.

Step Three: PTR Assessment - Functional behavioural assessment. Upon conducting the FBA the team then meets together to review data. Using this data, the team creates a hypothesis about the function of behaviour and examines the antecedent and consequence factors influencing CB.

Step Four: Intervention. This step consists of meeting as a team to develop an BIP based on the FBA findings. This involves choosing at least one strategy from each of the three elements – *prevent, teach and reinforce*. The PTR model provides a selection of function-based strategies to influence the environment in order to prevent CB occurring (prevent), teach new strategies to replace CB (teach) and change consequences (reinforce). The *prevent* strategies help remove or improve the events that influence or trigger CB. The *teach* strategies assist the child in learning new skills that will enable him/her to effectively navigate their social environment without CB. Teach strategies are replacement skills that serve the same objective as CB and include social interaction skills, cooperative play or parallel play, self-regulation skills, problem-solving, tolerating delay for a preferred activity or emotional literacy. *Reinforce* strategies remove the reinforcers for CB and ensure reinforcement follows DB. This includes changing the reinforcers or modifying those used in response to CB. Each strategy is chosen by the team based on how relevant it is to the hypothesis, team preference and ability to implement the strategy in their environment, and the extent of the strategies' evidence base in proving its effectiveness.

Once teams have developed their BIP, each team member has an individualised coaching session with the researcher to help team members gain the competence and

confidence needed for easy implementation. Coaching is provided in the context in which behaviour occurs.

Once coaching has been given to team members, the team will begin to implement the intervention plan and continue to use their data collecting system to record changes in behaviour.

Step Five: Using data and next steps. This step involves monitoring the data. If data is showing favourable progress the team will continue with the intervention. It is recommended that teams continue intervention for the same period of time that the CB has been occurring. For example, if the CB has been consistent for 6 months, continue with the intervention for 6 months. Teams can then consider reducing elements of the intervention or alter the BIP to fit the needs of the child. If the data shows that progress is inadequate, the team will investigate whether the intervention steps are being implemented with fidelity, if the reinforcers are effective, and if the function of the CB is still relevant.

As previously discussed, there is increasing evidence supporting the use of family-centred function-based PBS interventions that support the decrease of CB and increase of DB. PTR is one such intervention. As a standardised intervention that has been adapted for use in school, early childhood and home settings, PTR's small but considerable evidence base is gaining international recognition.

Chapter Two

Literature Review

The following literature review examines the progression of PTR from a school-based intervention, to early childhood centres and more recently, an intervention for family-centered positive behaviour support in home/community environments.

A review of the literature relating to the Prevent-Teach-Reinforce Model was conducted through PsychINFO and ERIC databases. The following key words were used; 'Prevent-Teach-Reinforce' was combined with the terms 'child' or 'children'; 'challenging behaviour' or 'challenging behavior'; 'family'; 'parents'; 'school'; 'adolescents' 'youth' 'child' or 'teenager'; 'Centre' ' to conduct individual searches. The terms 'positive behaviour interventions', 'supports'; challenging behavior and problem behavior were also combined with the search terms 'young children', 'interventions', 'strategies', 'best practice'. 'Tier 3 intervention', and 'challenging behavior' or 'problem behavior'. Ancestry searching and a search of the publications of key authors in the field were also conducted. Eleven studies were identified as a result of the literature search. Abstracts of each of these papers were examined and relevant papers were included. Studies included investigated the use of the manualised Prevent-Teach-Reinforce intervention or PBS adapted from PTR for intervention purposes, and PTR was implemented in a school, early childhood or home setting. Four of the studies identified were conducted in the school setting (DeJager & Filter, 2015; Dunlap, Iovannone, Wilson, Kincaid, & Strain, 2010; Iovannone et al., 2009; Strain, Wilson, & Dunlap, 2011), five in an early childhood environment (Dunlap, Lee, Joseph, & Strain, 2015; Dunlap, Strain, Lee, Joseph, & Leech, 2017; Snell et al., 2014; Stanton-Chapman, Walker, Voorhees, & Snell, 2016; Voorhees, Walker, Snell, & Smith, 2013), and two in the home setting (Bailey & Blair, 2015; Sears, Blair, Iovannone, & Crosland, 2013). The review is

presented in the following sections: School Setting; Early Childhood Setting; and Home Setting.

The Use of Prevent-Teach-Reinforce in the School Setting

Four studies were identified that used PTR in public elementary, middle, and high schools in the U.S.A (refer to Table 1). All studies used the standardised PTR Model for Schools to design and implement PTR BIPs in classroom environments (Dunlap, Iovannone, Kincaid, Wilson, Christiansen et al., 2010). The school studies focused on decreasing CB and increasing DB using PTR. The CB targeted were externalizing behaviours that caused disruption to the classroom environment or negatively impacted the child's ability to engage pro-socially with peers. However, it is important to note that the definitions of targeted behaviours differed for each child. Examples of definitions for CB were 'off-task behaviours' such as students leaving their desk, talking to peers, playing with books (Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010), and/or disruptive behaviour such as outbursts, excessive crying, blurting out during large group times (Strain et al., 2011). Examples of DB definitions were task engagement (Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010; Iovannone et al., 2009; Strain et al., 2011; DeJager & Filter, 2015), following directions, and interacting appropriately with peers (Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010).

Table 1: Experimental Studies on the Prevent-Teach-Reinforce for Schools Intervention

Author & Date	Participant identification n gender, age, diagnosis	Setting	Design & No. of participants	Dependent Variable	Measures	Procedure	Universal Practices	Overall results	Reliability	Maintenance/ Follow-up
DeJager & Filter. 2015	Students identified through Systematic Screening for Behavior Disorders (SSBD). One typically developing male.	Two rural public schools. General education classroom (all children).	Single subject A-B-A-B design.	Challenging behaviour (CB): Disruptive behaviours i.e. off-task, arguing, vocalizations, out-of-seat, making faces and wrecking peers work. Desirable behaviour (DB) Academic engagement.	CB: 10-sec partial interval. DB: 10 sec whole interval. Fidelity: PTR Fidelity of Implementation Guide – direct observation. Social Validity: PTR Social Validity Form (adapted from TARR-R) recorded on 5 point Likert Scale. Effect size: Tau U statistic.	Intervention (all children): Manualised PTR in School. BIP: <i>Prevent</i> - Environmental supports. <i>Teach</i> - Appropriate alternative behaviour. <i>Reinforce</i> – Escape opportunities, extinguishing problem behaviour.	Not discussed	CB: $M = 15.57\% - 6.11\%$. DB: $M = 63.43\% - 86.78\%$. Fidelity: 0%-100%. Social Validity (all children): Intervention has high validity on acceptability and fitting in with classroom routine. Effect size: Challenging behaviour = -0.88 ($p = <.01$). Desirable behaviour = 1.12 ($p = <.01$).	IOA (Interobserver Agreement) : 98.4%.	CB: Maintained at follow-up. Fidelity: 100% at follow-up.
	One typically developing male in fifth grade.					BIP: <i>Prevent</i> – Increasing non-contingent reinforcement. <i>Teach</i> – Alternative appropriate behaviour. <i>Reinforce</i> – Extinction of targeted behaviour.		CB: $M = 9.33\% - 4.90\%$. DB: $M = 53.67\% - 76.90\%$. Fidelity: 0% - 100%. Effect size: Challenging behaviour = -0.47 ($p = .14$). Desirable behaviour = 0.90 ($p = <.01$).	IOA: 98.3%.	No follow-up.
	One typically developing male in fourth grade.					BIP: <i>Prevent</i> – Prompts <i>Teach</i> – Alternative appropriate behaviours. <i>Reinforce</i> - Positive peer praise		CB: $M = 24.57\% - 15.60\%$. DB: $M = 36.33\% - 58.90\%$. Fidelity: 0% - 100%. Social Validity: Intervention has high	IOA: 98.7%.	CB: Not maintained at follow-up. Fidelity: 20% at follow-up.
Dunlap, Iovannone, Wilson, Kincaid, & Strain. 2010.	One typically developing 8-year-old male.	General education classroom.	Single case multiple-baseline across behaviours.	CB: Disruptive behaviour. DB: 1. Task engagement. 2. Independent work completion.	CB/Social skills: Social Skills Rating System (SSRS) recorded on 3 point Likert Scale (1 = never, 3 = very often). CB: PTR Behaviour Rating Scale (IBRST) - frequency of	Intervention (all children): Manualised PTR for Schools. BIP: <i>Prevent</i> – Choice making, environmental support. <i>Teach</i> – Appropriate behaviour.	Classroom management selected by teacher as a prevent strategy for all children.	Behaviour: a) SSRS: Social skills score; 85-92. Problem behaviour score; 127-113. b) IBRST (score out of 5): Disruptive behaviour: $M=3.8 - M=2.4$. Task engagement; $M=2.3 - M=3.6$.	Not recorded.	Not recorded.

One typically developing 9-year-old male.	General education classroom.	<p>CB: Off task behaviours. DB: 1. Following directions. 2. Interacting appropriately with peers.</p>	<p>disruption recorded on 5-point Likert scale (5 = high, 1 = rare). DB: 1.Task engagement: IBRST – percentage of time recorded on 5-point Likert scale (5 = high, 1 = rare). Academic Engaged Time (AET; SSBD) – duration of time engaged. 2. Independent work completion. IBRST - percentage of time recorded on 5-point Likert Scale (1 = no work completed, 5 = 75% or more completed). Fidelity: PTR Fidelity of Implementation Guide. Social Validity: PTR Social Validity Form.</p>	<p><i>Reinforce</i> – Escape from task following independent completion. Group reinforcement contingency.</p>	Not discussed.	<p>Independent work completion; $M=2.2-M=3.6$. c) AET: Task Engagement = 52%-82%. Fidelity: Baseline =80%. After child received training = 100%. Intervention = 100%. Social Validity (all children): High acceptability of behaviour plan, effectiveness of behaviour plan, willingness to carry out plan.</p> <p>Behaviour: a) SSRS: Social Skills; 90-118. Problem Behaviour; 110-85. b) IBRST (score out of 5): Off task behaviour; 2.8-1.6. Following directions; 2.8-4.5. Times to interact; 3.2-4.5. c) AET: Task Engagement; 26-84%. Fidelity: After 30 min coaching session = 80%. After 5 additional coaching sessions = 100%.</p>	Not recorded.	Not recorded.
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Iovannone, Greenbaum, Wang, Kincaid, Dunlap, & Strain. 2009	Identified via Stages 1 and 2 of the (SSBD). 245 students	Classroom in five public primary school districts.	Randomised control trial: Used block randomisation and Biased Coin Design (Efron, 1971) to allocate participants into two groups: 1) Intervention – PTR intervention 123 children. 2) Control Group – intervention as usual 105 children.	CB: Externalising behaviours e.g. tantrums. DB: 1. Social skills. 2. Academic engagement.	Demographics: Student Enrolment Survey, Student Record Survey, Classroom/Teacher Characteristic Survey, School Characteristic Survey. Behaviour: SSRS, AET Fidelity: PTR Fidelity Implementation Intervention Guide Social Validity: PTR Social Validity questionnaire	Intervention: Manualised PTR for Schools. BIP: <i>Prevent</i> – Choice making and environmental support <i>Teach</i> – Appropriate behaviour. <i>Reinforce</i> – Escape from task following independent completion and group reinforcement contingency. Control group: Intervention as usual i.e. social and tangible reinforcement, response cost, verbal reprimands and time-out.	Not discussed.	Retention: 92-93%. Behaviour: Intervention; $M=5.30, SD=10.08$. Control; $M=0.76, SD=7.37$. ($p<.001$, intervention effect size -0.44). Social Skills: Intervention; $M=7.38, SD=12.76$. Control; $M=1.25, SD=7.10$. ($p<.001$, intervention effect size 0.52). AET: Intervention; $M=0.13, SD=0.23$. Control; $M=0.04, SD=0.19$. ($p<.001$, intervention effect size 0.51). Fidelity: 122 teachers completed fidelity measure. Fidelity; $M=0.83, SD=0.21$ 75% achieved final fidelity score of 0.80 or higher. Social Validity: Overall acceptance of intervention; $M=4.20, SD=0.52$.	Not recorded	Preliminary results showed teachers had stopped implementing intervention once CB decreased or study discontinued.
Strain, Wilson, & Dunlap. 2011	One 5-year-old male with ASD	Regular kindergarten	Single case concurrent multiple baseline. Routine: Writing time	CB: Aggression, property destruction, obsessive-compulsive behaviours. DB: Task engagement.	CB (all children): Percentage of intervals. DB (all children): Percentage of intervals. Fidelity: PTR Fidelity of Implementation Guide. Social Validity: PTR Social Validity Form.	Intervention: Manualised PTR for schools. BIP: <i>Prevent</i> - Clear behaviour expectations. <i>Teach</i> - Self management. <i>Reinforce</i> - Positive reinforcement.	Not discussed.	CB: $M=52\%-10\%$. DB: $M=40\%-85\%$. Fidelity (all children): Intervention: 100%. Social Validity (all children): Overall $M=4.11$.	$M=94\%$.	CB: Declined at follow-up. DB: Maintained at follow-up. Fidelity: Above 90%.
	One 8-year-old male with ASD	General education classroom.	Routine: Writing time.	CB: Shutting down, walking away, blurting out during large group times. DB: Task engagement.		BIP (writing time): <i>Prevent</i> - Environmental support. <i>Teach</i> - Specific academic skills. <i>Reinforce</i> – Token economy.	Not discussed.	CB: $M=66.5\%-10\%$. DB: $M=23\%-80\%$.	$M=98\%$.	CB: Maintained at follow-up. DB: Maintained at follow-up. Fidelity: Above 90%.
	One 9-year-	General		CB: Outbursts,		BIP: <i>Prevent</i> – Visual	Classroom-	CB: $M=44\%-10\%$.	$M=96\%$.	CB:

old female with ASD/ Asperger disorder and specific learning disability.	education classroom.	excessive crying, obsessive- compulsive behaviours. DB: Task engagement.	aid. <i>Teach</i> – Problem solving skills. <i>Reinforce</i> – Token economies, ignoring.	wide strategy: Providing pro-social opportunities.	DB: $M = 20\% - 90\%$.	Maintained at follow-up. DB: Maintained at follow-up. Fidelity: Above 90%.
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Note: AET (Walker & Severson, 1990); IBRST (Dunlap, Iovannone, Wilson, Kincaid, & Christiansen et al., 2010); SSBD (Walker & Severson, 1990); SSRS (Gresham & Elliott, 1990); TARF-R (Reimers & Wacker, 1988), Tau U (Parker, Vannest, Davis, & Sauber, 2011).

The first of the elementary school studies (Iovannone et al., 2009) used a randomised control trial design to examine whether PTR implemented by typical educators was more effective in increasing social skills and decreasing CBs when compared to usual services, for 245 Grade K-8 (4-15 years old) students across 65 schools in five American public school districts. School environments included elementary, middle school and alternative/special schools. Participants were identified via the Systematic Screening for Behaviour Disorders tool (SSBD; Walker & Severson, 1990). All children included were engaging in intensive CB and were in need of tertiary level supports. Using block randomisation and Biased Coin Design (Efron, 1971), children were assigned to either the intervention group (PTR) or a comparison group (services as usual). Children assigned to the comparison group received the usual interventions and processes that schools and districts delivered to children with CBs; about 40% of these children had BIPs (Iovannone et al., 2009). The classroom teacher acted as the main interventionist in both groups however teachers in the PTR group had collaborative support from a PTR consultant. Each PTR team followed procedures outlined in Dunlap, Iovannone, Kincaid, Wilson, and Christiansen et al. (2010) school-based manual to design and implement an individualised BIP for each child. The target behaviours were social skills, problem behaviour and academic engagement time. The PTR individualised BIP included a combination of prevent, teach and reinforce strategies. Social validity was collected using an adapted questionnaire based on the Treatment Acceptability Rating Form (TARF-Revised; Reimers & Wacker, 1988) from 124 teachers in the PTR intervention group. No social validity data was recorded for services as usual. Of note, the authors developed the PTR Fidelity of Implementation Intervention Checklist to measure teacher adherence and quality. Fidelity was measured through direct observation by the PTR consultant. Posttreatment assessment occurred two months later with a 93% response. Follow-up data

was being collected at the time of publication. Importantly, it appears teams did not assess and implement universal classroom-wide practices or measure reliability.

The results of this study demonstrated that the students who received the PTR intervention had significant improvement in their prosocial behaviour ($M= 7.38$) when compared to services as usual ($M=1.25$), and those in the intervention group had a larger decrease in CB (5.30 points) compared to services as usual (0.76 points). Likewise, children who received the PTR intervention increased the amount of time they spent actively engaged during independent instructional times ($M=0.13$) when compared to control group children ($M=0.04$). Study findings also demonstrated that teachers implemented PTR strategies with high fidelity ($M= .83$), and that they rated the social validity of the PTR model highly ($M= 4.20$). Of note, the highest score ($M= 4.80$) was on the item 'teachers willingness to carry out behaviour plan.' This is significant as this finding indicates that PTR's collaborative process may encourage teachers to use behaviour strategies. Preliminary follow-up results showed that teachers had discontinued with implementation once the study stopped or CB decreased.

Dunlap, Iovannone, Kincaid, Wilson, and Strain (2010) and Strain et al. (2011) expanded on this initial study by providing case studies of children who participated in the Iovannone et al. (2009) study. Children were nominated as cases according to criteria such as presence of diagnosis, school district, classroom setting, and parental permission (Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010; Strain et al., 2011).

In this second study, Dunlap, Iovannone, Kincaid, Wilson, and Strain (2010) aimed to illustrate the application of PTR in a typical school environment by presenting two case studies of typically developing 8 and 9-year-old males. The authors used a multiple-baseline across behaviours design to investigate behaviour change by measuring CBs and DBs were measured using IBRST in addition to Social Skills Rating System (SSRS) and academic engagement time (AET) at baseline and intervention. Each PTR team developed their own

IBRST to measure behaviours on a daily basis. For example, one team measured frequency of disruptions and task engagement, and percentage of work completed within assigned times, compared to the other team who measured perceived number of teacher prompts of redirects and frequency of use of appropriate peer behaviours, during times of intermingling.

Classroom management was implemented as a universal strategy for the 9-year-old boy. This consisted of identifying behaviour expectations and reinforcement. It appears that Dunlap, Iovannone, Kincaid, Wilson, and Strain (2010) did not examine reliability and report follow-up data.

The outcomes from this study showed that the 8-year-old male had decreased in disruptive behaviour from an average of 3.8 at baseline to an average of 2.4 post-intervention (score out of 5). Likewise, his DB increased from average baseline rates of 2.3 for task engagement and 2.2 for work completion to an average of 3.6 for both DBs post-intervention. Similarly, the 9-year-old male's average rate of off-task behaviour was 2.8 at baseline; this rate decreased at post-intervention to an average of 1.6. His average baseline ratings in following directions and times to interact increased from average rates of 2.8 and 3.2 to 4.5 for both DBs post-intervention. Fidelity results across both teams showed that after their first coaching session, teachers scored 80% fidelity. With additional coaching sessions with teachers and in one case, a coaching session with the 8-year-old child, fidelity scores increased to 100%. Social validity results across both cases showed that teachers rated PTR for schools highly on items such as acceptability, willingness to carry out plan, effectiveness of behaviour plan, and effectiveness of intervention plan on teaching desirable behaviours.

Strain et al. (2011) offered additional validation of PTR by examining the feasibility of PTR to support specific disability groups in an inclusive kindergarten and general education classrooms. They described three cases of children with autism (5 & 8-year-old male & 9-year-old female) who participated in a concurrent multiple-baseline across

participants design study. The children engaged in a range of CB (i.e. disruptive behaviours, obsessive compulsive behaviours and avoidant behaviours; refer to Table 1). In addition to the Iovannone et al. (2009) study, Strain et al. (2011) included reliability of data recording and used percentage interval to measure CB/DB. Importantly, one case (refer to Table 1) assessed classroom-wide universal practices and implemented pro-social interaction opportunities to improve class-wide problem solving skills and focus on class-wide positive attention. In accordance with previous studies fidelity was measured using the PTR Fidelity of Implementation Guide. Behaviour was measured at baseline (4 to 7 days), intervention (3 to 4 days) and follow-up (3 to 4 days). Follow-up consisted of facilitation from authors being withdrawn.

Results revealed that across cases CB decreased from baseline to intervention and maintained or declined at follow-up, while task engagement (DB) increased from baseline to intervention, and was maintained or increased slightly at follow-up (see Table 1). Results showed 94-98% reliability, and fidelity of implementation achieved 100% at intervention, however there was a slight decrease (less than 90%) at follow-up across cases. Overall teachers rated social validity of PTR highly with a mean = 4.11.

A fourth study DeJager and Filter (2015) is the only study in schools that used students who were not originally part of the Iovannone et al. (2009) study. DeJager and Filter (2015) examined the overall efficacy of PTR in schools with three typically developing children (5 to 11-year-old males) engaging in CB in rural general education classrooms. They used an A-B-A-B single subject design with one or four week follow-up for two cases. Targeted CB were disruptive behaviours (refer to Table 1) measured with 10-second partial intervals. The DB was academic engagement, measured by 10-second intervals. These were conducted through daily direct observation across 20 minute sessions by the author. The effects of the PTR intervention were reported via Tau-U statistics (Parker, Vannest, Davis, &

Sauber, 2011). Reliability of target behaviour was also assessed via interobserver agreement (IOA)

Interestingly, the outcomes demonstrated that disruptive behaviours for all three children decreased from baseline levels across intervention phases, while academic engagement increased across intervention phases. Specifically, for the typically developing male, disruptive behaviours decreased from an average of 16% at baseline to 6% at intervention. These gains were maintained at follow-up. Academic engagement increased from an average of 63.43% at baseline to 86.78% at intervention. In particular, the authors highlighted that PTR was more statistically effective in changing academic engagement for all three participants ($p = <.0.1$) compared to disruptive behaviour ($p = <.0.1-.14$), which indicated varying degree of effect (i.e. strong, moderate or minimal) across children. Using the PTR Fidelity of Implementation Checklist to observe teacher implementation, treatment fidelity results showed that all teachers implemented the intervention well. However, follow-up results indicated one teacher had stopped implementing intervention strategies at follow-up. Social validity scores showed a moderate degree of acceptability. IOA ratings indicated that there was little variance in ratings of CB and DB between observers ($M = 98.3\%-98.7\%$ across cases).

In sum, the school studies indicated PTR produced decreases in targeted CBs and increased targeted DBs from baseline levels. This behaviour change can be accredited in part to teachers' ability to implement intervention steps with high fidelity. Similarly, PTR received positive social validity results, with teachers rating their acceptability as moderate. However there were limitations to these studies. Two studies reported assessment and/or implementation of classroom-wide practices for two cases (Dunlap, Iovannone, Wilson, Kincaid, & Strain.

2010; Strain et al., 2011). Considering classroom-wide practices are emphasised in PTR, this limited acknowledgement of classroom-wide practices in school-studies brings into question its importance. A second limitation was that Iovannone et al. (2009) only collected social validity from the PTR group, and no social validity data was recorded for services as usual. Without this comparison it is difficult to understand the significance of the PTR's social validity. Thirdly, Iovannone et al. (2009) acknowledge that SRSS (Gresham & Elliott, 1990) may not have been an accurate measure in showing the magnitude of behaviour change. Similarly, factors such as learnt skills before intervention or universal classroom-wide strategies may impact on the SSRS scores. Thus caution is needed when interpreting the findings (Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010). Fourth, while ANOVA was used to compare intervention and control groups, a superior analysis could have investigated other influencers on teacher implementation and overall success. Fifth, post-test scores in social skills, CB and AET were still within the high-risk range, despite showing significant differences from pre-test scores (Iovannone et al., 2009). Sixth, IBRST measures teachers' perception of behaviour which is arguably less reliable than direct observations (Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010). Seventh, the children from the Strain et al. (2011) study were relatively high functioning and from one school district, therefore, it cannot be concluded that PTR will produce the same outcomes for all children with ASD. Lastly, DeJager and Filter (2015) highlighted that it was difficult to draw conclusions about the validity of PTR as teachers' perceptions were influenced by their experience with the general process and the individualised interventions developed for each student.

Overall, in light of the limitations of this research, these findings suggest that PTR intervention in elementary and middle schools or specialist classrooms yields positive behaviour change across a range of ages. In contrast, results suggest that services as usual appear less effective in producing improved behavioural outcomes for children who are in

need of tertiary supports. Secondly, results indicate that PTR coaching is beneficial in teaching educators to implement the PTR steps and this can be maintained when coaching is withdrawn. Furthermore, with support, teachers have the skills necessary to implement PTR strategies with 100% consistently and appropriately in typical classroom environments. Similarly, teachers perceived PTR as an acceptable tool to be used within their classroom practice. Overall results suggest that PTR in schools offer effective behavioural support in schools and potential effective support for children with disabilities, such as autism.

Prevent-Teach-Reinforce and Early Childhood Education

To address one of the limitations of the school studies, Dunlap et al. (2013) developed a revised standardised PTR intervention for young children (PTR-YC). Two studies have investigated PTR-YC; one a single subject case study design (Dunlap et al., 2015) and one an RCT (Dunlap, Strain, Lee, Joseph, & Leech, 2017). In addition, three A-B design studies have adapted principals of PTR to address behaviour at universal, secondary and tertiary tiers (Snell et al., 2014; Stanton-Chapman et al., 2016; Voorhees et al., 2013). In these three studies ABC-Prevent-Teach-Respond problem-solving processes were employed alongside other positive behaviour support strategies. The PTR-YC studies are discussed first and then the adapted studies (refer to Table 2).

Two studies have provided evidence for the effectiveness of PTR-YC. Initially, Dunlap et al. (2015) stated that PTR may not fit well in early childhood settings but then investigated PTR-YC with two case studies of a 4-year-old typically developing male and a 3-year-old male with developmental delays. The early childhood settings were an inclusive childcare centre and a preschool classroom. The PTR team differed depending on the classroom make-up, use of additional supports, and the ability for parents to participate. Dunlap et al. (2015) used the processes outlined in the PTR-YC manual (Dunlap et al., 2013).

Importantly, this study completed the classroom-wide practices assessment to evaluate whether universal practices were influencing the child's CB.

The two classroom environments differed, taking into account the classroom structure, and timetable, the number of children, developmental ages and needs of the children, the number of teachers in each classroom and their experience, strategies used by staff to address the children's CB, and the needs of the participating children. The four-year-old boy's targeted CB was aggression, property destruction, and targeted DB was engaging pro-socially with peers and independently engage in activities without CB. The three-year-old boy's targeted CB was refusal behaviour, and targeted DB was directions in completing play and/or activity sequences. Behaviour was measured using the IBRST, however anchors for each child were dependent on the behaviour teams intended to measure. PTR-YC BIP strategies were chosen based on the outcome of the PTR/FBA process and included at least one strategy from each of the Prevent-Teach-Reinforce components. It appears Dunlap et al. (2015) only assessed the classroom-wide practices for the typically developing 4-year-old male (refer to Table 2). However no universal classroom-wide practices were highlighted as affecting behaviour for this child, therefore no implementation of universal classroom-wide practices was needed. Social validity and reliability was not measured in this study. No follow-up data was recorded.

Table 2: Experimental Studies on the Prevent-Teach-Reinforce for Young Children Intervention

Author & Date	Participant identification gender, age, diagnosis	Setting	Design & No. of participants	Dependent Variable	Measures	Procedure	Universal Practices	Overall results	Reliability	Maintenance/ Follow-up
Dunlap, Lee, Joseph, & Strain. 2015	One typically developing 4-year-old male.	Inclusive childcare centre.	Single subject multiple-baseline design. Routine: Arrival, centre time, large group and snack time.	Challenging Behaviour (CB): 1. Aggression. 2. Property destruction. Desirable Behaviour (CB): 1. Peer prosocial behaviour. 2. Independently engage in activities without challenging behaviour.	CB: IBRST – frequency of total number of times aggression and destructive behaviours observed DB: IBRST – frequency of total number of times prosocial behaviours observed Fidelity: PTR-YC Fidelity of Strategy Implementation Form – direct observation	Intervention: Manualised PTR-YC. BIP: <i>Prevent</i> – Visual support, schedules <i>Teach</i> – Visual schedules, self-monitoring, peer related social skills. <i>Reinforce</i> – Reinforce desirable behaviour.	None identified.	C): $M = 3.5 - 1$. DB: $M = 1 - 5$. Fidelity: 78%-100%.	Not recorded	Not recorded
	One 3-year-old male with development delays.	Inclusive preschool classroom.	Routine: Centre time.	CB: Refusal behaviour. DB: Directions in completing play and/or activity sequences.	CB: IBRST – tracked refusal by number of times was prompted to return to centre or work area DB: IBRST – number of 3- step play sequences completed	BIP: <i>Prevent</i> – Provide choices, use visual supports and schedules <i>Teach</i> – Visual schedules. <i>Reinforce</i> – Reinforce desirable behaviour.	Not discussed.	CB: $M = 4.5 - 3$. DB: $M = 2.3 - 3$. Mean increase in his ability to follow directions correlated with an improvement in his ability to follow 2 to 3 more steps per play and activity sequence. Fidelity: 44% -100%.	Not recorded	Not recorded
Dunlap, Strain, Lee, Joseph, & Leech. 2017	160 children.	72 public preschool classrooms 20 Head Start classrooms 16 child cares.	Randomised control trial: Biased coin design (Efron, 1971) used to assign children into two conditions: 1) Intervention – PTR-YC; 2) Control - “business-as-usual”	CB – 1. Physical aggression and/or verbal aggression to self, other, or the physical environment. 2. Non-compliance. 3. Taking objects from others. 4. Tantrums.	CB/Social skills: Social Skills Intervention System Rating Scales (SSIS). DB: Engaged Time (ET): Momentary time sampling (Gast & Ledford, 2014) – 10 s intervals across 10 min videos (60 intervals per video) scored for % of “engaged” or “not engaged”. Behaviour:	Intervention: Manualised PTR-YC. BIP: <i>Prevent</i> – Choice making and environmental support. <i>Teach</i> – Appropriate behaviour. <i>Reinforce</i> – Escape from task following independent completion and/or group reinforcement contingency.	Not discussed	Attrition: 8%. CB (SSIS): Intervention; $M = 34.94 - 27.80$; $SD = 12.21 - 13.20$. Control; $M = 31.00 - 29.37$; $SD = 10.77 - 11.66$. ($p = .002$, effect size = .062). Social skills (SSIS): Intervention; $M = 49.95 - 66.11$; $SD = 19.43 - 19.61$. Control; $M = 48.73 - 55.37$; $SD = 16.85 - 18.54$. ($p = .001$, effect size =	CB IOA (Inter-observer agreement) $M = 99\%$. DB IOA: Engagement time; $M = 90\%$.	Not recorded

	(BAU).	5. Crying/screaming. 6. Elopement or attempts to elope. DB: 1. Social skills. 2. Engaged time.	5. Momentary time sampling – 10s intervals scored for % of “challenging behaviour” or “no challenging behaviour”. Procedural Fidelity: 13 item checklist covering the 5 PTR-YC steps. Social Validity: PTR Social Validity Form recorded Family social validity; Questionnaire - 5 point Likert Scale (1 = low, 5 = high).				.062). ET: Intervention; $M = 74.25 - 87.39$; $SD = 20.75 - 11.38$. Control; $M = 73.10 - 78.08$; $SD = 19.32 - 18.15$. ($p = .007$, effect size = .048). Behaviour: Intervention; $M = 7.29 - 3.05$; $SD = 8.63 - 4.41$. Control; $M = 5.29 - 4.03$; $SD = 7.48 - 5.80$. ($p = .014$, effect size = .040). Procedural Fidelity: Intervention: Completed all 13 implementation steps. Control: Averaged less than one of 13 steps. Social Validity: Teachers; High acceptability, willingness, permanent improvement, contextual fit, effective in teaching appropriate behaviour Parents; High acceptability, effectiveness, simpleness, flexibility and inexpensive.			
Snell, Voorhees, Walker, Berlin, Roorbach, Jamison, Stanton-Chapman. 2014	107 children.	Six Head Start classrooms .. Note: One classroom divided into two groups of children. 16-20 children per class.	Time series design.	CB: Inappropriate behaviour; 1) Physical aggression. 2) Verbal aggression. 3) Disruptive verbal behaviour. 4) Disruptive physical behaviour. 5) Refusing to participate.	Quality of classrooms measured by teacher behaviour and classroom practices measured before baseline: Classroom Assessment Scoring System (CLASS); Classroom interactional processes (emotional support, classroom organisation, instructional support) on 7 point Likert scale (1-2 = inadequate care, 6-7 = quality care). Early Childhood Environment Rating Scale – Revised (ECERS-R) – scores	Baseline: Video tapes of problem routines. Intervention: Universal Problem-Solving Approach; two workshops (orientation and universal), and two coaching sessions (initial and follow-up). ABC-PTR taught in universal workshop and in initial coaching session used ABC-PTR to develop an action plan for improving targeted routines.	Intervention addresses class-wide practices.	Teacher behaviour and classroom practices measured before baseline: ECERS-R; $M = 5.37$. Emotional support; $M = 4.68$ Classroom organisation; $M = 5.19$ Instructional support; $M = 2.99$ CB: Baseline: $M = 44.9\% - 71.0\%$. Intervention: $M = 22.5\% - 52.9\%$. Phase change: $M = 18.1\% - 40.8\%$ reduction in CB. Fidelity to intervention: Baseline: $M = 0\% - 60.7\%$. Intervention: $M = 63.8\% - 100\%$.	Child inappropriate behaviour IOA (all children): $M = 87\%$. Fidelity IOA: Baseline; 95%. Intervention ; 93%.	Not recorded

Stanton-Chapman, Walker, Voorhees, & Snell. 2016	<p>Tier I 179 children</p>	Ten Head start classrooms Average of 18 children per class.	A-B design.	Difficult classroom routines.	<p>range from 1-7, (1 = inadequate quality, 3 = minimal, 5 = good, 7 = excellent quality). CB: - Multi-Option Observation System for Experimental Studies (MOOSES); 10s partial intervals Fidelity: 33% baseline & 25% intervention tapes randomly selected and coded. Social Validity: Questionnaire recorded on 5 point Likert Scale (1 = strongly disagree, 5 – strongly agree). Self-Monitoring: Workshop self-monitoring checklist. Coaching Self-Monitoring Checklist. Problem-Solving Process checklist.</p>	<p>Tier I: 1-2 hour workshop teaching a six-step ABC-PTR problem solving process for classroom routines.</p>	Tier I intervention addresses class-wide practices.	<p>Tier I: CLASS; Emotional support; $M = 4.53-5.39$ ($p = .090$) Classroom organisation; $M = 4.67-5.32$ ($p = .025$). Instructional support; $M = 2.95-2.62$ ($p = .590$). ECERS-R; $M = 5.16-5.38$ ($p = .045$). Fidelity: $M = 85\%$. Structural: $M = 85.66\%$. Interaction: $M = 80.4\%$. Social Validity: $M = 4.8$.</p>	<p>Fidelity IOA: Tier I: Baseline; 95% Intervention ; 93%.</p>	Not recorded
	<p>Tier II Seven males and three</p>			<p>CB: Poor social and language skills,</p>	<p>Child outcome measures: Tier II and III: Child Behaviour</p>	<p>Tier II: 1.20 -2 hour workshop using Social Pragmatic Storybook</p>	Participated in Tier I.	<p>Behaviour: CBCL; Externalising behaviour – Baseline individual scores</p>	<p>Fidelity IOA: Tier II:</p>	Not recorded.

females between 3.75 -5 years of age.		and problem behaviours e.g. unable to recognise body language and facial expression of peers, difficulty joining in with groups of children.	Checklist –Teacher Form (CBCL) for externalising and internalising behaviour (≥ 60 = clinical). SSRS for social skills (<85 = clinical) and problem behaviour (>115 = clinical).	intervention (SPSI)	= 41-63. Intervention individual scores = 29-47 ($p = .05$). Internalising behaviour – Baseline individual scores = 1-48. Intervention individual scores = 0-27 ($p = .08$). Total mean difference in problem behaviour ($p = .05$). SSRS; Social Skills – Baseline individual scores = 61-88. Intervention individual scores = 80-97 ($p = .05$). Problem behaviour – Baseline individual scores = 101-120. Intervention individual scores = 90-103. ($p = .05$). Fidelity: Structural: $M = 97\%$. Interaction: $M = 76\%$. Social Validity: $M = 4.7$.	Baseline; 94%. Intervention ; 95%.		
Tier III One typically developing male	Two Head Start classrooms	CB: Did not follow directions, physically disruptive/aggressive behaviour.		Tier III: 2 hour workshop on PTR and online resources such as the Routine-Based Support Guide for Young Children With Challenging Behaviour (Lentini, Vaughan, & Fox, 2004).	Participated in Tier I	CBCL; Externalising behaviour – 78-51. Internalising behaviour - 19-20. SSRS; Social Skills: 58-77. Problem behaviour: 131-106. Fidelity: Structural across entire routine: $M = 70.4\%$ -97.2%. Social Validity: $M = 4.5$	Tier III: Structural; 95%. Interaction; 100%.	Not recorded.
One male with ASD		CB: Aggressive behaviour during classroom transitions.			Participated in Tier I	CBCL; Externalising behaviour: 53-30. Internalising behaviour: 42-24. SSRS; Social Skills: 58-78. Problem behaviour: 96-77.		Not recorded.
One female with language		CB: No engagement in			Participated in Tier I and	CBCL; Externalising behaviour: 68-49.		Not recorded.

	delays.		classroom activities, off-task behaviours and disruptive physical behaviour.				II.	Internalising behaviour: 13-7. SSRS; Social Skills: 67-88. Problem behaviour: 117-96. Structural occurring once or twice: 92.7%, 100%, 66%.		
Voorhees, Walker, Snell, & Smith. 2013	One 4-year-old male with social emotional delays	Two Head Start classrooms	Single subject multiple-baseline design. Routine: Clean-up.	CB: 1. Non-compliance to directions. 2. Physically disruptive/aggressive behaviour. DB: Selects and participates appropriately in clean-up job.	Behaviour (all children): Coded video tapes using MOOSES – percentage of time behaviour occurred. Fidelity: 1. Structural components; duration of adherence to intervention and frequency of strategies used 2. Interaction components; partial interval of strategies. Social Validity: Questionnaire – 5 point Likert Scale (strongly disagree - strongly agree).	Intervention: Individualised PBS process using ABC-PTR. BIP: <i>Prevent</i> - choice and visual timer. <i>Teach</i> – Visual cues and verbal reminders. <i>Reinforce</i> – Reinforce appropriate behaviour, redirect with visual cues.	All children participated in Tier I intervention	CB: 67%-0.6%. DB: 0%-88.7%. Fidelity: Structural; % of time strategy correctly implemented: $M = 70.4\%$; % of opportunities: $M = 92.7\%$. Interaction; Reinforce appropriate behaviour: $M = 0\%-36\%$. Redirection strategies: $M = 0\%-22.9\%$. Social Validity (all children): Strongly agreed or agreed with 1. Strategies or doable practical, 2. Likely to continue using strategies, 3. Behaviour improved, and 4. Feel less stress related to behaviour.	Child behaviour IOA (all children): CB: $M = 99\%$. DB: $M = 99\%$. Fidelity IOA: Structural; $M = 95\%$. Interaction; $M = 100\%$.	CB: Maintained at follow-up DB: Maintained at follow-up Fidelity: Structural; 100% at follow-up. Interaction; Maintained at follow-up.
	One female 4-year-old with moderate to significant delays in all development areas.		Routine: Circle/mat-time.	CB: 1. Off-task behaviour. 2. Disruptive physical behaviour. DB: 1. Stays with group and participates during circle time. 2. Requests break. 3. Waits for teacher permission to leave circle.		BIP: <i>Prevent</i> -Cube chair for seating, mini-schedule. <i>Teach</i> – Request break, model use of mini-schedule. <i>Reinforce</i> – Comply with break requests, reinforce appropriate behaviour.		CB: 64.1%-1.2%. DB: 35.9%-98.8%. Fidelity: Structural; % of time strategy correctly implemented: $M = 97.2\%$. % of opportunities: $M = 100\%$. Interaction; Reinforce appropriate behaviour: $M = 20.3\%-21.2\%$. Redirection strategies: $M = 33.8\%-35.3\%$.		CB: Maintained at follow-up DB: Maintained at follow-up Fidelity: Structural - 100% at follow-up. Interaction - Maintained at follow-up.
	One 3-year-old male with ASD		Routine: circle/mat-time.	CB: 1. Refusal to join morning circle/mat time.		BIP: <i>Prevent</i> – Transitional object, preferred activity,		CB: 97.9%-65.1%. DB: 2.1%-34.9%. Fidelity: Structural: % of		CB: Maintained at follow-up

2. Aggressive behaviour.
DB: 1. Carries foam letter to circle time.
 2. Sits in circle.
 3. Uses break card.

reduce circle time and provide alternate activity.
Teach – Request break, use transitional object.
Reinforce – Comply with break requests, redirect using visual cues.

time strategy correctly implemented: Not measured.
 % of opportunities: $M = 66\%$.
 Interaction: Reinforce appropriate behaviour: $M = 14.7\% - 30.9\%$.
 Redirection strategies: $M = 56.4\% - 42.7\%$.

DB: Maintained at follow-up
Fidelity: Structural - 100% at follow-up.
 Interaction - Maintained at follow-up.

Note: AET (Walker & Severson, 1990); CBCL (Achenbach, 2000); CLASS (Pianta, LaParo, & Hamre, 2008); ECERS-R (Harms, Clifford, & Cryer, 2005); MOOSES (Tapp, Wheby, & Ellis, 1995); IBRS (Dunlap, Iovannone, Wilson, Kincaid, & Christiansen et al., 2010); SPSI (Stanton-Chapman, Walker, Jamison, & Smith, 2014); SSRS (Gresham & Elliott, 1990); SSIS (Gresham & Elliott, 2008).

Results showed that PTR-YC was effective in decreasing CB and increasing appropriate behaviour for both children. Improvements in targeted behaviour differed for each child (refer to Table 2). The four-year-old boy had decreases in his frequency of property destruction and aggression from baseline rates ($M = 3.5$ respectively) during intervention ($M = 1$ respectively). Similarly, his frequency of prosocial behaviour increased during intervention ($M = 5$) compared to from baseline rates ($M = 1$). The three-year-old boy had decreases in his refusal behaviour from baseline rates ($M = 4.3$) during intervention ($M = 3$), and increased in his ability to follow directions during intervention ($M = 3$), from baseline rates ($M = 2.3$). The two teams implemented the intervention steps confidently and with competence. Importantly, the PTR-YC Fidelity of Strategy Implementation Form showed that the intervention steps were being implemented with 44% -78% ($M = 61\%$) fidelity across teams at baseline, yet after coaching from the PTR consultant, fidelity increased to 100% across both teams at intervention.

Dunlap, Strain, Lee, Joseph, and Leech (2017) provided further support for the efficacy of PTR-YC by conducting a RCT with 160 children across 106 pre-K or Head Start classrooms. They compared manualised PTR-YC to intervention procedures already in place ('business as usual'; BAU) to examine the effectiveness of each approach in decreasing young children's CB. Dunlap, Strain, Lee, Joseph, and Leech (2017) used the SSIS (Gresham & Elliott, 1990) to measure CB and social skills, as did Iovannone et al. (2009). However, in contrast to Iovannone et al. (2009) and the other ECE studies (Dunlap et al., 2015; Snell et al., 2013; Stanton-Chapman et al., 2016; Voorhees et al., 2014), Dunlap, Strain, Lee, Joseph, and Leech (2017) directly observed engagement time (DB) and CB via three 10-minute videos at pre-test and post-test. Each video observation was assessed using momentary time sampling with 10 second intervals to determine behaviour outcomes. Moreover, unlike Dunlap et al. (2015), Dunlap, Strain, Lee, Joseph, and Leech (2017) did not use the IBRST

(Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010) to measure behaviour outcomes. Analysis was conducted via mixed ANOVA procedures. Similarly, in contrast to Dunlap et al. (2015) and Iovannone et al. (2009), Dunlap, Strain, Lee, Joseph, and Leech. (2017) measured reliability of behaviour ratings for observers. There was no measure to assess teachers' implementation fidelity. Instead, procedural fidelity was evaluated to examine the team's ability to complete the 13 PTR-YC procedures. Also of note, Dunlap, Strain, Lee, Joseph, and Leech (2017) measured parent's perspectives of PTR-YC in addition to teachers. It appears classroom-wide universal practices were not assessed. Additionally no maintenance and follow-up data was recorded.

The results on the SSIS problem behaviour index indicated that the PTR-YC children started with slightly higher CB ($M = 35$) at pre-test compared to the 'business as usual' (BAU) children ($M = 33$), but at post-test PTR-YC children had slightly lower CB ($M = 28$) than 'business as usual' children ($M = 29.37$). In other words, both interventions resulted in decreases in CB however the PTR-YC children experienced more change in CB between pre- and post-test compared to BAU children. Direct video observations of CB confirmed that the PTR-YC group had a statistically higher ($p = .014$) levels of CB at pre-test (PTR-YC, $M = 7$; BAU, $M = 5$), which decreased at post-test ($M = 3$) compared to the BAU group ($M = 4$). Both groups had similar SSIS social skills scores (PTR-YC, $M = 50$; BAU, $M = 49$) at pre-test yet at post-test, the PTR-YC group had higher levels of social skills ($M=66$) in contrast to the BAU group ($M = 55$). Similarly, assessing video observation levels of engagement time, both groups had comparable levels of engagement at pre-test (PTR-YC, $M = 74$; BAU, $M = 73$), yet PTR-YC participants had higher levels of engagement at post-test. The results of this study suggested that PTR-YC was more effective in producing positive behaviour change compared to BAU. Moreover, PTR-YC was shown to be effective in decreasing CB's and increasing DBs for a small group of children of varying ages and types of CB's.

The findings also demonstrated that the PTR-YC intervention group implemented all 13 steps compared to the BAU group who averaged less than one of 13 PTR-YC steps. Social validity was high across parents ($M = 4.80$) and teachers ($M = 4.72$), indicating that PTR-YC intervention was viewed as highly appropriate in supporting behaviour change in different early childhood settings across a variety of children's CBs.

The first of the three ABC-PTR studies was Snell et al. (2014) who targeted class wide routines in six Head Start kindergarten classrooms with a total of 107 children (16-20 per classroom). The teacher and teacher aide from each of the six classrooms participated. Targeted CB involved any child engaged in one or more inappropriate behaviours during a targeted routine (refer to Table 2). Teaching desirable behaviour was not the focus of intervention. To assess teacher behaviour and classroom practices before baseline, Snell et al. (2014) used Classroom Assessment Scoring System (CLASS; Pianta, LaParo, & Hamre, 2008) and Early Childhood Environment Rating Scale-Revised (ECERS-R; Harms, Clifford, & Cryer, 2005). Additionally, CB was measured from video observations using Multi-Option Observation System for Experimental Studies (MOOSES; Tapp, Wheby, & Ellis, 1995). Teachers were supported by coaches through two 'Universal Problem Solving Approaches for Difficult Classroom Routines' intervention workshops and two coaching sessions within a week following baseline. ABC-Prevent-Teach-Respond steps were taught in the initial workshop and coaching session. Steps were similar to PTR processes; 1) identify challenging routines; 2) identify ABCs for challenging behaviour; 3) identify appropriate strategies; 4) develop action plan using PTR strategies; 5) implement plan; 6) and evaluate plans effectiveness and revise as needed (Snell et al., 2014). Teams monitored their adherence to the Prevent-Teach-Respond steps through a checklist. In contrast to school and ECE studies, Snell et al. (2014) measured fidelity of implementation via video observations to evaluate structural (i.e. environmental or routine) changes, and interaction components such as the

number of teacher interactions with students. Reliability of behaviour ratings and implementation fidelity were measured by randomly selecting 20% of videos across phases. No maintenance or follow-up data was recorded.

Results from the ECERS-R measure showed that the six classrooms had an average score of 5.37 indicating that the majority of classrooms had high quality practices. CLASS results showed that classrooms had moderate emotional support ($M = 4.7$) and classroom organisation ($M = 5.2$) and minimal instructional support ($M = 3$). Scores showed that class-wide CB decreased from a mean of 50%-71% across the six teams at baseline to a mean of 23% to 53% across teams at post intervention. In other words, during intervention challenging behaviour decreased on average between 18%- 40% from baseline scores. Self-monitoring results showed that all six teams implemented all six steps of the problem-solving process. However, teachers needed support to identify antecedents and consequences, identify and select intervention strategies, and to implement and evaluate the plan. Fidelity of implementation results showed that teachers increased in their ability to implement strategies to between 64%-100% during intervention (refer to Table 2). Behaviour measures had high reliability ($M = 87\%$), while fidelity of implementation at baseline and intervention had very high reliability ($M = 95\%$, $M = 93\%$ respectively).

Voorhees et al. (2013) evaluated an adapted PTR individualised process for children whose CB persisted after participating in a universal intervention. Teachers were given additional instruction and coaching from consultants over an eight to 11 week period to provide additional support for one child with autism, one child with social-emotional delays and one child with significant delays in all developmental areas. Teams included a teacher, at least one teaching assistant, and a coach with experience in education. Using a single-case multiple baseline design, Voorhees et al. (2013) measured each child's targeted CB and DB. Child behaviour was coded using MOOSE to measure the percentage of time behaviour

occurred. Of note, Voorhees et al. (2013) assessed implementation fidelity and reliability of fidelity similarly to Snell et al. (2014). Follow-up was completed at four or nine weeks to assess maintenance of behaviour outcomes.

Results indicated that post intervention, all three children's rates of CBs had decreased from baseline rates (Baseline: 64%-98%; Intervention 0.6%-65%), while DBs increased from baseline rates during intervention (Baseline: 0%-36%; Intervention 35%-99%). Refer to Table 2 for individual child results. Follow-up results showed that CB and DB were maintained at four or nine weeks post-intervention. Likewise, all teacher's adherence to structural (Baseline: 0%- 20%; Intervention: 21%-35%) and interaction (Baseline: 0%- 56%; Intervention: 23%-43%) strategies increased from baseline to intervention and remained high at follow-up for most teachers (refer to Table 2). Finally, social validity results were high with teachers rating all five items as either "strongly agree" or "agreed", showing support for the effectiveness of intervention to assist children with differing developmental needs.

Expanding on the Snell et al. (2014) and Voorhees et al. (2013) studies, Stanton-Chapman et al. (2016) aimed to examine the efficacy of a three-tiered PBS model. Ten Head Start classrooms participated, with 179 children in Tier I intervention, 10 children in Tier II and three children at Tier III. Specifically, children in Tier III had a range of targeted behaviours such as non-compliance, disruptive/aggressive behaviour, and off task behaviours. Desirable behaviour was not a focus of intervention. Teams consisting of a lead teacher, teaching assistant and consultant participated in four 1-2 hour workshops (overall training, Tier I, Tier II, and Tier III) using a six-step ABC-Prevent-Teach-Respond problem solving process. In the workshops they identified and analysed the ABCs of problematic routines and designed Prevent-Teach-Respond action plans to be used across all three tiers to improve classroom routines and individual child behaviours. Outcomes measured varied depending on the Tiers (refer to Table 2). Of note, Tier III measures were Child Behaviour Checklist

(CBCL; Achenbach, 2000), and SRSS (Gresham & Elliott, 1990) for social skills and CB. Both measures were completed by teachers. Implementation fidelity was assessed for reliability at baseline and intervention via video. No maintenance or follow-up data was recorded.

Across tiers, the results indicated improvement in classroom routines and individual child behaviour (refer to Table 2). Significantly, children who had BIPs (Tier III) showed a decrease in externalising and internalising behaviour and an increase in social skills at intervention. For example, a female with language delays showed decreases in externalising (CBCL scores = 68-49) and internalising behaviour (CBCL scores = 13-7) from baseline to intervention, while social skills increased from 67-88 (< 85 = clinical) at intervention. Similarly implementation fidelity varied across tiers and teachers. Importantly, Tier III fidelity differed across classrooms depending on the strategies used, with two children from one classroom having higher structural fidelity (93% to 100%) compared to a child from the other classroom (66%). Additionally, implementation fidelity at baseline and intervention had high percentages of IOA across tiers (refer to Table 2). Across tiers, social validity was high (4.5 to 4.8) indicating that teachers believed that the intervention was acceptable. However, seven of the 10 teachers provided social validity feedback.

Importantly, although ABC-PTR has been adapted from PTR principles, the processes, training and coaching sessions, consultants' knowledge of PTR, targeted behaviours/routines and measurement differed somewhat from PTR-YC procedures. Although it appears that PTR principles were used in this study, this study implemented PBS across tiers, therefore the efficacy of PTR from results found in Snell et al. (2014), Stanton-Chapman et al. (2016) and Voorhees et al. (2013) cannot be verified. Similarly, although participants in the adapted studies (Snell et al., 2014; Stanton-Chapman et al., 2016;

Voorhees et al., 2013) took part in Tier I intervention, whether PTR classroom-wide practices were assessed and incorporated into intervention is not discussed.

Overall, the small number of ECE studies showed that intervention at all levels of support (Tier I to III) using PTR principles supported encouraging outcomes for children with CB. Results showed that teachers were confident and consistent interventionists and perceived the PTR intervention procedures and effects positively. There are some limitations to the ECE studies. Firstly, Dunlap, Strain, Lee, Joseph, and Leech (2017) noted that it was difficult for teams in special education settings to implement plans that had a peer-related social skill component, as they did not have typically developing children to model social skills. Secondly, Snell et al. (2014) acknowledged that there was variability in intervention plans across classrooms. Thirdly, because the consultants in Dunlap, Strain, Lee, Joseph, and Leech (2017) and Stanton-Chapman et al. (2016) used a checklist to measure adherence to processes, there is possible bias as there was no third party assessment. Fourth, there was limited time to collect consistent data due to short phases. Factors such as delay between phases, practical problems with technology and inconsistent data collection resulted in modifications to experimental design (Snell et al., 2014; Voorhees et al., 2013). Fifth, data analysis across studies was simple, limiting possible conclusions and assessment of potential influential factors. Lastly, research was conducted within the constraints of school environments (e.g. school calendars, teacher illnesses, vacation times, field trips, testing requirements, administration requests, concerns of safety of other children). This influenced the number of coaching sessions and limited the amount of time to collect data or implement and assess interventions (Snell et al., 2014; Stanton-Chapman et al., 2016).

In conclusion, bearing in mind limitations, the ECE studies indicated that PTR principals and processes can be adapted for universal implementation and produce positive change in routines for a large group of children. Outcomes also provided further support for

ABC-PTR individualised plans, demonstrating that children who receive support at Tier I had decreases in CB once an individualised plan was implemented. Likewise teachers and teacher aides rated Tier I and II programmes highly, suggesting their support for such programmes. Similarly, outcomes demonstrated that the manualised PTR assessment and intervention at Tier III also produces beneficial behaviour change in children whose CB may have been resistant to Tier I and Tier III supports. Results also illustrate that intervention steps can be executed by teachers, with support from trained facilitators. The results also indicate that PTR is a good contextual fit over multiple education settings from early childhood to secondary schools and in inclusive settings and specialised environments.

Prevent-Teach-Reinforce and Home Settings

In 2013, the Prevent-Teach-Reinforce intervention for families (PTR-F; Dunlap, Strain, Lee, Joseph, Vatland, & Fox, 2017) was established to provide a family-centred early intervention model. PTR-F was developed to empower parents/caregivers to participate in the design and implementation of the PTR intervention for use in home/community environments. To ensure applicability and usability for families, aspects of PTR were adapted or added, such as the PTR functional assessment, strategies to enhance collaborative family-facilitator relationships and coaching. However, the five key steps of PTR remain the same.

Two studies have aimed to demonstrate the efficacy of PTR-F in the home environment (refer to Table 3).

Table 3: Experimental Studies of the Prevent-Teach-Reinforce for Families Intervention

Author & Date	Participant identification gender, age, diagnosis	Setting	Design & No. of participants	Dependent Variable	Measures	Procedure	Universal Practices	Overall results	Reliability	Maintenance/ Follow-up
Bailey & Blair. 2015	One 7-year-old male with ASD, AHD and language disorder	Mother, father and younger brother.	Single case non-concurrent multiple baseline design.	Challenging Behaviour (CB): Prolonging dressing routine. Desirable Behaviour (DB): 1. Completing dressing routine independently. 2. Completing dressing routine completely.	CB: IBRST – duration of dressing routine in minutes. DB: IBRST – 1. Percentage of independent tasks completed 2. Duration of dressing routine in minutes Fidelity: PTR Fidelity of Implementation Checklist. Social Validity: 1. PTR Social Validity Form Semi-structured interviews. 2. Naïve observers rated acceptability of the plan & child behaviour. Procedural Integrity: PTR checklist - independent observer. Parental use of IBRST: compared to direct observation by research team.	Intervention: Manualised PTR-F. BIP: <i>Prevent</i> – Provide choices <i>Teach</i> – Replacement behaviour, physically incompatible replacement, engagement <i>Reinforce</i> – Praise, discontinued dressing.	Not discussed.	CB: $M = 15-7.6$ mins DB: 1&2. $M = 25\% - 88\%$. Fidelity: 0% - 94%. Social Validity: 4.8 Procedural Integrity: 100% across children. Parental use of IBRST: Completed by mothers in every session across phases. No differences between parents and research staff.	CB Inter-observer agreement (IOA): No data. DB IOA: No data. Fidelity IOA (all children): 100%. Procedural integrity IOA (all children): 100%.	CB: $M = 4.7$ at maintenance. CB: 93% at maintenance. Fidelity: 100% at maintenance.
	One 6-year-old male with ASD	Mother and father.	Routine: Car ride from home to school	CB: Physical aggression and disruption. DB: Wearing seat belt.	CB: IBRST – percentage of intervals engaging in physical aggression/disruption DB: Percentage of intervals wearing seat belt.	BIP: <i>Prevent</i> - Provide choices, adult verbal behaviour, positive praise. <i>Teach</i> – Prompt to say “listen to me please”, physically incompatible replacement behaviour. <i>Reinforce</i> – Positive attention seeking, physically incompatible	Not discussed.	CB: 92% - 14%. DB: 8% - 88%. Fidelity: 6% - 95%. Social Validity: 4.9.	CB IOA: 100% in baseline 98% in intervention DB IOA: 100% in baseline 98% in intervention	CB: 0% at maintenance. DB: 100% at maintenance. Fidelity: 100% at maintenance.

					replacement behaviour, discontinue reinforcement of challenging behaviour, crisis intervention plan.					
	One 5-year-old male with language delay.	Mother, father, younger brother.	Routine: Playtime with younger brother.	CB: 1. Refusal to play with brother/engage in play activity specified by mother. 2. Aggressive play towards brother. DB: Appropriate vocalisations.	CB: IBRST – percentage of intervals engaging in refusal/aggressive behaviour. DB: IBRST- percentage of appropriate vocalisation.	BIP: <i>Prevent</i> – Provide choice, environmental supports, transition support. <i>Teach</i> – Social story package. <i>Reinforce</i> - All replacement behaviours, discontinue reinforcement of challenging behaviour, delay gratification.	Not discussed.	CB: 83% - 21%. DB: 0.5% - 27%. Fidelity: 0-90%. Social Validity: $M = 4.4$. Naïve observers: $M = 1.6 - 4.5$.	CB IOA: 94% in baseline 99% in intervention. DB IOA: 97% in baseline 98% in intervention.	CB: 21% at maintenance. DB: 52% at maintenance. Fidelity: 100% at maintenance.
Sears, Blair, Iovannone, Crosland, 2013	One 4-year-old male with PDD-NOS	Mother, father, 6 year old sister.	Single base multiple – baseline design across routines. Routine: 1. Bathroom. 2. Independent play. 3. Mealtime (generalisation routine).	CB: Inappropriate chewing DB: 1. Independent completion of bathroom steps without prompts 2. Eating unfamiliar or non-preferred food.	CB: IBRST; Percentage of intervals with inappropriate chewing DB: IBRST; 1. Percentage of bathroom steps completed 2. Number of bites of unfamiliar food (generalisation). Fidelity: Number of interventions steps completed by parent and/or second caregiver. Social Validity: 1. Parental self-rating using adapted. TARF-R recorded on 5 point Likert scale 2. Naïve parent ratings recorded 5 point Likert scale. Procedural Integrity: PTR Integrity Checklist via independent observer.	Intervention: Manualised PTR-F BIP: <i>Prevent</i> – Environmental support. <i>Teach</i> - Communicative behaviour, independent skills. <i>Reinforce</i> – Discontinue reinforcement, reinforce replacement behaviour. Note: intervention plan not given for independent play and mealtime routine.	Not discussed	CB: 93% - 3%. DB: 1. Independent bathroom routine; 14% - 53.3%. 2. Eating unfamiliar food; $M = 0 - 3$ bites (generalisation). Fidelity: a) Mother; Baseline: 0-10% (across routines); Intervention: 92% (bathroom) and 100% (play) b) Father: < 10% - 90% across routines. Social Validity: Parents rated independent play routine 4.3 and mealtime routine 4.6. Procedural Integrity: 100% across both families.	Not recorded	DB: 1. Independent bathroom routine; maintained at follow-up. Fidelity: Mother; 100% at follow-up.

One 6-year-old male with ASD	Mother, father, 8 year old brother.	Routine: 1. Car ride routine. 2. Morning routine.	CB: 1. Repetition of phrases or words. 2. Tantrums. DB: Following directions.	CB: IBRST - 1. Rate of repeating questions or phrases per minute. 2. Percentage of intervals with tantrum behaviour. DB: IBRST - percentage of intervals with following directions	BIP (Car ride): <i>Prevent</i> – Provide alternative items. <i>Teach</i> – Functional prosocial behaviour. <i>Reinforce</i> – Verbal praise, conversation. BIP (Morning): <i>Prevent</i> – Environmental supports. <i>Teach</i> – Physical prompts. <i>Reinforce</i> – Discontinue reinforcement of problem behaviour, positive praise.	Not discussed.	CB: 1. Repetition; 3.3 – 0.04. 2. Tantrums; 75%-19%. DB: 25%-81%. Fidelity: 1. Car ride routine; 0-89%. 2. Morning routine; 2-88%. Social validity: 1. Parents rated car ride routine 4.6 and morning routine 4.5. 2. Naïve observers across children and routines: 1.3 – 4.7.	Not recorded.	Not recorded.
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Note: IBRST (Dunlap, Iovannone, Wilson, Kincaid, & Christiansen et al., 2010); TARF-R (Reimers & Wacker, 1988).

Sears et al. (2013) led a single case design study of a 4-year-old boy with pervasive developmental disorder - not otherwise specified (PDD-NOS) and a 6-year-old boy with ASD, to examine whether adapting the PTR model for families was achievable and successful in improving their child's CB. The children were receiving special needs services such as verbal behaviour therapy or physical therapy, but the range, intensity and length of services received differed. Both boys lived at home with their mother, father and an older sibling. Sears et al. (2013) collaborated with families using PTR-F to design and implement a PTR-F BIP for two routines in which CB occurred. The sibling of the 4-year-old boy participated in the programme by assisting her parents in intervention. Similarly, the family of the 4-year-old boy had a generalisation phase (Mealtime), which consisted of parents designing and implementing a PTR-F BIP with minimal support from the PTR consultant. It appears that universal home practices were not assessed and implemented before intervention commenced. Targeted CB and DB differed for each child (refer to Table 3). As such, each child's IBRST 5-point Likert scales differed according to behaviour. For example, the CB of the 4-year-old with PDD-NOS was measured using percentage of interval with inappropriate eating, and desirable behaviour was measured by percentage of steps completed in his bathroom routine and number of bites of unfamiliar food. Baseline data was collected for three to seven sessions for both children. The intervention phase lasted five to 18 sessions across children. Intervention strategies for both children included at least one strategy from each category of Prevent-Teach-Reinforce (refer to Table 3) according to the function of behaviour. Of note, the PTR-F BIP for the bathroom routine for the 4-year-old child with PDD-NOS was outlined, but PTR-F BIPs for independent play and mealtime routine were not. Four follow-up data points were collected two weeks after invention for the 4-year-old with PDD-NOS for his bathroom routine only. No follow-up data was collected for the 6-year-old male. Sears et al (2013) measured social validity using PTR Social Validity Form

and naïve parent ratings. The naïve parent ratings were novel to this study. They measured social validity by watching two to four minutes of randomly selected video clips of baseline and intervention and rating acceptability of child behaviour, parent behaviour and implementation using a 5-point Likert scale adapted from Buschbacher, Fox, and Clarke's (2004) social validity measure. Also, procedural integrity was assessed using PTR Integrity Checklist via an independent observer.

Results showed that for both children, their CB decreased from baseline levels at intervention. Inappropriate chewing decreased from 93% to 3%, tantrums decreased from 75% to 19%, and repetitive behaviours decreased from 3.3-0.04 (scale out of 5). Similarly, DB increased from baseline rates during intervention. Completion of bathroom steps increased from 14% to 53.3%, the number of bites of unfamiliar food increased from 0 to 3, and following directions increased from 25% to 81%. The 4-year-old's completion of bathroom steps was maintained at follow-up. Results also revealed that all parents increased their fidelity of implementation during intervention ($M = 88\%$ -100% across parents) from baseline levels ($M = 0\%$ to 10% across parents). Moreover, procedural integrity scores showed that both families completed all of the PTR steps correctly. Social validity scores added further endorsement of PTR with high ratings (4.3-4.6) across families. Similarly, naïve observer ratings indicated an increase in acceptability of child behaviour, parent behaviour and implementation of steps from baseline levels ($M = 1.3$) during intervention ($M = 4.7$).

These findings provide preliminary evidence to suggest PTR-F was effective in decreasing CB and increasing DB for two children with disabilities in the home setting. Likewise the results showed that PTR-F was successful in empowering families to design and implement an intervention to improve their child's behaviour. This study was unique as this

was the first time generalisation had been tested in this way and this capability may not be the case for all families (Sears et al., 2013).

The second PTR-F study by Bailey and Blair (2015) replicated Sears et al. (2013) with the aim of evaluating the practicality and possible results of PTR-F. Additionally, they aimed to address limitations of previous PTR studies. In particular, the need for guidance for families in designing BIPs and the practical use of the IBRST by parents. To address these limitations, Bailey and Blair (2015) incorporated a guided question template to help parents identify intervention strategies, and measured parental use of the IBRST through comparing IBRST data to direct observation data.

Bailey and Blair's (2015) participants were a 7-year-old male with ASD, Attention Hyperactive Disorder, and language disorder; a 6-year-old with ASD; and a 5-year-old with language delay and sensory processing problems. The three children lived at home with their mother and father, with one child being an only child and the other two having a younger sibling. All children were receiving special needs services such as speech and language therapy or applied behaviour analysis. Bailey and Blair (2015) followed PTR-F procedures outlined in Sears et al. (2013). It appears that universal home practices were also not assessed or implemented before intervention commenced in Bailey and Blair (2015). However there were differences in children's CB and the routines in which the behaviours occurred. The IBRST measured the duration of the behaviours, the percentage intervals in which the behaviours occurred and strategies used in intervention. Unlike Sears et al. (2013) and previous PTR studies (DeJager & Filter, 2015; Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010; Dunlap et al., 2015; Dunlap, Strain, Lee, Joseph, & Leech, 2017; Iovannone et al., 2009; Strain et al., 2011), this study incorporated a maintenance phase. This involved fading a portion of the intervention components (e.g. expanding amount of time between engagement in conversation and praise from 5 minutes to 10 minutes and no longer using a

Social Story) and modifying the implementation checklist (Bailey & Blair, 2015). In contrast to Sears et al. (2013), this study measured reliability of behaviour ratings and fidelity implementation across participants and phases. IOA for behaviour was measured for two families and IOA for fidelity implementation was measured for all families.

Child outcomes provided further evidence that PTR-F was effective in decreasing CB and increasing DB. Challenging behaviour decreased across all three children from baseline to post-PTR intervention. There was a reduction of 15 to seven minutes to complete a dressing routine; a reduction of 97% to 14% of intervals engaging in physical aggression/disruption; and a reduction of 83% to 21% intervals engaging in refusal/aggressive behaviour. Similarly, CB continued to decrease or remained stable for all three children during the maintenance phase (see Table 3). DB increased from baseline to post-intervention, with an increase from 25% to 88% of dressing steps completed independently and completely; an increase from 8% to 88% of intervals wearing seatbelt; and an increase from 0.5% to 27% of appropriate vocalisation. Desirable behaviour also remained stable or increased for all three children during the maintenance phase (refer to Table 3). IOA results showed that CB and DB behaviour ratings were highly reliable for two children across observers and sessions ($M = 94\%-98\%$). Results also indicated that parents increased in their ability to implement the intervention steps proficiently and confidently, from between 0-6% at baseline to between 90-95% in intervention, while at maintenance, fidelity increased to 100% for all families. IOA for fidelity implementation was 100% across all families and sessions. PTR-F was further validated as an acceptable family-centred intervention, with parents perceiving it very highly, with ratings between 4.4-4.8 points (score out of 5). Moreover, the naïve observers noted an improvement in the children's participation and behaviour in routines post intervention, along with the parents using the PTR-F strategies effectively and appearing more comfortable using the new strategies during the intervention

phase. Procedural integrity results showed that all three families completed all PTR-F steps successfully (100%) and in accordance to the PTR-F manual.

There were several limitations to PTR-F home studies. Firstly, Sears et al. (2013) two families were implementing verbal behaviour interventions before PTR-F. This pre-intervention may have influenced the results of PTR-F. Secondly, data recording were delayed or limited due to factors influencing video recording (i.e. malfunctioning equipment, camera errors, family holidays, family commitments, and lack of availability), thus constraining the researchers' ability to determine the true effectiveness of PTR-F (Bailey & Blair, 2015). Thirdly, Bailey and Blair (2015) did not randomly assign baseline lengths which could allow previous events to influence the effects of intervention. Lastly, Bailey and Blair (2015) found that families who did not have prior knowledge of PTR struggled with understanding intervention strategies.

Overall, the two home studies demonstrated that PTR-F is effective in producing behaviour change for a small group of children in their home environment. Likewise, families were active change agents, with the ability to learn the PTR-F strategies and implement them confidently and accurately. Also, the PTR-F process was liked by families thus appears to fit well in family routines, and its strategies were appropriate and practical in producing behaviour change. Importantly, Bailey and Blair (2015) validated the IBRST by showing that parents can be reliable data collectors of their child's behaviour.

Overall Limitations

The current literature on PTR has a number of limitations. PTR emphasises the importance of addressing classroom or home universal practices. Three studies addressed PTR universal practices for children in need of individualised support. One study assessed universal practices and identified no practices that required implementation before

intervention commenced, and two studies implemented classroom wide strategies within their PTR BIP (Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010; Dunlap et al., 2015; Strain et al. 2011). Snell et al. (2013) and Stanton-Chapman et al. (2016) specifically addressed classroom routines using ABC-PTR principals. Participants who received individualised support in Stanton-Chapman et al. (2016) and Voorhees et al. (2014) took part in Tier I interventions. However, whether PTR classroom universal practices were assessed or were a part of intervention in ABC-PTR studies is not evident. As such, to date, the manualised Prevent-Teach-Reinforce intervention has yet to investigate the efficacy of implementing universal practices before intervention commences and the potential outcomes of universal practices on behaviour change.

Secondly, each study discussed in this review was conducted with considerable facilitation from university based consultants. It is unknown how PTR could be implemented without expert support or how much training teachers, other school personnel and parents would need to be able to implement the PTR procedures in their school/home environments independently (Bailey & Blair, 2015; Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010; Iovannone et al., 2009).

Thirdly, while it appears PTR results increased DBs, only one study (Bailey & Blair, 2015) including a maintenance phase and two studies reporting follow-up data (DeJager & Filter, 2015; Voorhees et al., 2013). Therefore, it is unclear if PTR implementation strategies are maintained over time and place once consultants have withdrawn, or whether behaviour change is maintained once teacher/parents decreased or stopped implementing strategies. However, three studies do not provide enough data to examine the extent of PTR's effectiveness on maintaining behaviour long-term. Similarly, only one study (Sears et al., 2013) included a generalisation phase. Whilst it is important that families may be able to use their new found knowledge once consultants have left, there is a question still to be answered

about whether behaviour change generalises to other routines and is maintained over time. Thus, it can be concluded that behaviour improvements were effective in the situations in which they occur but for the new behaviour to be maintained and generalised, it is possible that this would need to be programmed for (Fisher et al., 2011).

Fourth, the six case studies had a limited amount of participants, with varied ages, ethnicities and diagnoses (Bailey & Blair, 2015; DeJager & Filter, 2015; Dunlap, Iovannone, Kincaid, Wilson, & Strain, 2010; Dunlap et al., 2015; Strain et al., 2011; Sears et al., 2013). Therefore it is possible that different contexts with different children could produce different results.

Fifth, DeJager and Filter (2015) highlight the limitations of FBA procedures used in PTR. Specifically, PTR relies on anecdotal information to create a FBA hypothesis statement. Developing hypothesis statements could be challenging for teachers or parents as they may lack expertise in understanding the principles and skills of the FBA process and how to interpret data. This could result in irrelevant intervention plans or limit the effectiveness of intervention for specific targeted behaviours (DeJager & Filter, 2015).

Sixth, PBS approaches, including PTR highlight the need for families to be involved in intervention (Carr et al., 2002; Kincaid et al., 2016). However, there was limited involvement of families in the ECE and school studies. It appears that only two children had parental input in school/ECE studies (Dunlap et al., 2015; Strain et al., 2011). While studies may aim to have family involvement, in practice this may be difficult due to conflicts in schedules of parents and teachers, demands faced by single parent families or the interest of families. However, family involvement is essential as they provide significant information about their child, including strategies adopted at home, behaviour challenges and parental responses. Families are the primary influence on children's long term behaviour (Voorhees et al., 2013).

Finally, the PTR-F research base is narrow and requires further research support. For example, while it appears PTR has been adapted effectively in schools, early childhood and home settings, it has yet to be applied in these settings outside of the United States. Indeed, home environments in New Zealand differ to those in the United States as the culture, family values, desires and needs for children are different.

Rationale for research

The home environment is a critical place for children to learn appropriate social-emotional and behaviour competence as they look first to their parents as their primary teachers (Fettig & Ostrosky, 2011; Bronfenbrenner & Morris, 2006). For young children who engage in CB, early intervention is imperative to ensure their long term outcomes are positive (Schuhmann et al., 1998; Dunlap et al., 2006; Duda et al., 2008). Children who engage in persistent CB often require individualised intensive support in addition to universal practices. Individualised PBS interventions such as PTR can assist parents in gaining an understanding of the function of behaviour and learn skills they can implement at home and community, to improve their child's behaviour outcomes and family quality of life (Lucyshyn et al., 2007). Current literature provides support for the effectiveness of family-centred function based PBS interventions, including PTR in producing behaviour change for young children (Bailey & Blair, 2015; Duda et al., 2008; Fettig & Ostrosky, 2011; Moes & Frea, 2000; Sears et al., 2013; Vaughn et al., 2002).

The focus of this current study was to investigate whether the PTR-F intervention was an effective and feasible intervention with New Zealand families. The current study extends previous research into the effectiveness of PTR by applying the intervention in the New Zealand home environment and including a universal practices phase to examine whether universal home practices implemented by the parents influence potential outcomes.

Research Questions

The following research questions were addressed:

Research Question 1: How effective are the universal home practices in teaching prosocial social-emotional competence and decreasing persistent CB in a New Zealand home setting?

Research Question 2: How effective is Prevent-Teach-Reinforce for families (PTR-F) in teaching prosocial social-emotional competence and decreasing persistent CB in a New Zealand home setting?

Research Question 3: How applicable is Prevent-Teach-Reinforce for families (PTR-F) to New Zealand settings?

Chapter Three

Method

Experimental Design

This project employed a single-case multi-intervention across participants. A single case design uses rigorous experimental conditions to compare the effects of different conditions (independent variables) on behaviour outcomes (dependent variables) of individual children. A single case design was selected as it allowed the participating family's values and goals for their child to be the focus of intervention (Sexton-Radek, 2014). While the procedures used in single-case designs are similar, the targeted behaviour, types of measures and interventions vary across cases, because single-case designs recognise that the child, behaviours and family contexts of each case are different. An AB₁B₂B₃ design was used to draw conclusions about individual outcomes, as the transition from baseline to treatment conditions shows trends of the child's targeted behaviour and allows comparisons to be made between different conditions (baseline and intervention). There was also no need to withdraw intervention which may be problematic when using other single case designs such as ABAB (Kazdin, 2016). The conditions in this project were pre-intervention (baseline), universal home practices, PTR-F intervention 1 and 2, and follow-up.

Ethical Approval

Prior to recruitment of participants, ethical approval was obtained from the University of Canterbury Educational Research Human Ethics Committee (refer to Appendices A & B). All parents/caregivers and children were provided with an information form (refer to Appendices C & D), a parent consent form (refer to Appendix E) and child assent form (refer

to Appendix F). The information form outlined the purpose and requirements for the project. The consent form outlined the commitments and potential risks identified in the project. Informed consent was obtained by parents/caregivers and assent was obtained from each child. The children included in this study were not able to provide informed consent due to their age, so assent was sought. The names of all participants were changed to ensure anonymity.

Recruitment

The original intention was to recruit participants through early childhood centres. However, due to time constraints and parent willingness to participate, no participants were recruited via this means. To address this issue, the author approached a local psychological service to request assistance with recruitment. The service manager agreed to provide this assistance. The service manager then approached several referred parents/caregivers via email or phone requesting permission for the author to contact them. Parents/caregivers who expressed interest in being involved in the study, and who gave permission, were contacted via email by the author. They were also provided with an information letter and a meeting was requested. Interested families then directly contacted the author via email or phone. The author set up a meeting with parents/caregivers at a time convenient for the family to discuss the project, their role in the process, and to provide an opportunity for the parents/caregivers to ask questions and sign the consent form (Appendix E). Once consent was granted from parents/caregivers, their child was informed of the project by their parents/caregivers and was invited to participate (Appendix D). Their parent signed the child assent form (Appendix F).

Inclusion criteria. Criteria for inclusion in the study was as follows: 1) the family has at least one child between 2 ½ -5 years of age; 2) this child must be engaging in persistent

CB; 3) English was their first language to be able to understand that requirements of the project and treatment processes; and 4) parents/caregivers of the child were willing to participate in PTR-F procedures. Children and parents were excluded if they did not meet any of the criteria for inclusion. This age range was selected because early intervention has shown to be effective with this age range and outcomes can be maintained long term (Smith & Fox, 2003; Dunlap & Fox, 2011).

Participants

Three families met inclusion criteria for the project. Participants ranged in age from 2 ½-5 years and were all male. All children engaged in some form of persistent CB at home. Table 4 outlines each family's demographic information.

Luke. Luke was a 4½-year-old New Zealand European male with developmental delays in academic, communication, social and independent self-care skills. Luke presented as an active, sociable child, who enjoyed Lego, water play, and investigating how things work. Luke lived with his mother and father with the family expecting a second child in 6 months.

Luke's parents' had concerns about his ability to listen and respond to instructions, engagement in vocalisations when someone was talking to him, rough play with toys and absconding from his parents when out in the community. Luke's concerning behaviour occurred at home and in the community with his parents. His parents' reported no concerning behaviour at preschool. Luke's parents' reported that his behaviour has been challenging since infancy. His CB resulted in avoidance of non-desirable activities and/or tasks, confiscation of toys, verbal threats and/or reprimands from his parents. Luke's parents' reportedly found this behaviour very stressful, describing it as "going into battle" every day.

They felt that this influenced their ability to enjoy activities in the community. Luke's parents' had previously sought support from a registered psychologist, positive parenting websites, and parenting seminars for assistance with behaviour concerns. As noted in Table 4 Luke's parents' used a number of positive strategies with varying success such as time out, praise and offering alternatives, however any progress made when implementing these strategies was not maintained.

Oliver. Oliver was a typically developing 2½-year-old New Zealand European male. He lived with his mother, father and younger sister (7 months). Oliver enjoyed trains, singing and construction, and was described by his mother as sensitive, with a well-developed sense of humour.

Oliver's parents' had concerns about his persistent crying and tantrums at home and out in the community. His parents' reported he had CB since infancy, but more so in the last year. At times his behaviour resulted in Oliver engaging in head banging and he found it difficult to calm down even with assistance of his favourite toy. Oliver's parents' had previously sought assistance for behaviour concerns from a paediatrician and two general practitioners. His parents had used multiple strategies such as verbal redirection, calming and soothing with little success.

Finn. Finn was a 4½-year-old New Zealand European male. Finn was typically developing; however his parents reported concerns about his social skills, academic learning, speech and hearing, and toilet training. During the course of the project, Finn was in the process of receiving medical support for chronic ear infections.

Table 4: Demographic Information of Participating Families

Child	Gender	Age (years)	Family Ethnicity	Family Structure	Age of Parents (years)	Length of Challenging Behaviour	Previous Strategies Used	Previous Assistance Sought	Peer friendships	Child Interests/ Strengths
Luke	Male	4.5	New Zealand European	Mum, Dad & expecting 2 nd child.	40-44	4 years	Time out, offering alternatives, removing desirable items, choice, praise, verbal reprimands/scolding, physical guidance, removed from activity, end activity, verbal warning/redirects, 'when-then' statements, tangible rewards, visual schedules, ignoring, 10 minute play time with parent.	Registered Psychologist, positive parenting websites, parenting seminars.	Yes	Observant, practical (hands-on), likes to understand how mechanical things work, sociable, Lego, water play, transport, sports.
Oliver	Male	2.5	New Zealand European	Mum, Dad & sister (8 months).	30-34; 55-59	1 year	Time out, verbal warnings/redirection, calming/soothing, physical restraint, provide assistance, end activity.	Paediatrician, 2 General Practitioners.	Yes	Singing, building towers, trains, sharing with others, sensitive, sense of humour.
Finn	Male	4.5	New Zealand European	Mum and Dad	45-49	6 months	Time out, offering alternatives, removing desirable items, explaining, activity changed, verbal warning/redirects, verbal reprimands/scolding, physical restraint.	None	Yes – one friend	Music, sports, swimming, sociable, empathetic.

Finn's parents' reported a number of behavioural concerns, including not accepting 'no', tantrums, non-compliance, property destruction (i.e. throwing objects) and physical aggression (i.e. hitting and kicking). This behaviour had begun in the last six months and had resulted in his mother not feeling safe in taking him out into the community by herself. His parents had no previous assistance for behaviour concerns. His parents had used different strategies including removing desirable items, physical restraint and time out (refer to Table 4). His parents reported that time out was the most effective, however the behaviour had not resolved.

Setting

All meetings, observations and coaching sessions were carried out with the child's parent(s), in the family home. Meetings mostly took place in the evenings. Observations and coaching sessions took place during targeted routine times or times convenient for the family.

Measures

Demographic and background information. Demographic information and information about the history of CB on each of the three families was gathered via a questionnaire (refer to Appendix G). The aim of the questionnaire was to provide information about each family, and specific information about the parents' current behaviour strategies, if they had any additional support, and their child's interests. These questions also identified specific behaviour problems and the length of occurrence of this behaviour. Sub-questions were asked depending on the parents' response to initial questions. These questions included:

- Have you sought assistance for your child's CB? If so, who with? If so, for what?
- What strategies have you used in the past?
- Which ones haven't been effective? Why?

- How long has the CB been occurring?

Dependent and independent variables. The dependent variables were the child's challenging behaviour (CB) and parent identified desirable behaviour (DB). The independent variables were the universal home practices and PTR-F intervention 1 and 2.

Child behaviour. To examine the impact of PTR-F intervention on each child's behaviour, the dependent variables were recorded using the following behaviour definitions. Behavioural definitions were developed during the PTR-F process with each child's parents and the author. Targeted dependent variables for each child were:

Luke. Targeted challenging behaviour was non-compliant behaviour. This was defined as ignoring or resisting instructions by changing the subject of conversation or running away. Luke's DB was compliant behaviour. This was defined as following an instruction within 10 seconds.

Oliver. Targeted challenging behaviour were tantrums. Tantrums were defined as crying or screaming persistently, verbally repeating what he wants, dropping to the floor and head banging. Oliver's DB was redirect to preferred activity. This was defined as redirection to a preferred activity and engagement in this activity.

Finn. Targeted challenging behaviour was tantrum behaviour. Tantrum behaviour was defined as crying, throwing objects, verbal threats (i.e. you are not coming to my party, I'm not your friend), breaking items, kicking, hitting, and biting. Finn's DB was compliance to parents' request within 10 seconds.

The challenging and desirable behaviours were measured using the Individualised Behaviour Rating Scale Tool (IBRST; Appendix H) by the parent and direct observations by the author in the home setting.

The Individualised Behaviour Rating Scale Tool (IBRST). The IBRST is a direct observation tool that rates the child's CB and DB in the natural setting in which the behaviour occurs. A separate 5-point Likert-type scale is used for challenging and desirable behaviours. The IBRST relies on the observers' perception or estimates of the extent of behaviour occurring during a specified time period (Iovannone, Greenbaum, Wang, Dunlap, & Kincaid, 2014).

The IBRST was selected as the measurement tool as it was designed for use in PTR. It aims to be an easy to use tool that is not time consuming to complete and it is simple for parents to be able interpret behaviour outcomes. The IBRST has been shown to be a reliable practicable and consistent tool longitudinally, particularly for discrete CBs (Iovannone et al., 2014). The IBRST has been used in several PTR studies (Bailey & Blair, 2015; Dunlap, Iovannone, Wilson, Kincaid & Strain, 2010; Dunlap et al, 2015; Sears et al, 2013).

The IBRST has strong feasibility as each family team decides on how the behaviour is going to be measured i.e. frequency, duration, intensity, percentage of time or percentage of opportunities. The IBRST uses a 1-5 rating scale, in which the team decide on anchors for each number. For example, a score of 1 could be a mildly intense instance of hitting that does not hurt while a score of 5 could be a highly intense instance of hitting that caused injury or pain. Similarly, for DB such as engaging in an activity, 1 could be 1 minute or less while a score of 5 could be 20 minutes of engaging in activity. Once the observation recording measure has been chosen, the team decided on when the behaviour is to be measured, who would measure and complete the IBRST and an appropriate time to complete the IBRST.

Coaching IBRST: The author coached the team on how to use the IBRST. Coaching consisted of explaining aspects of the IBRST including; observing defined targeted behaviour, specific times for recording data (i.e. routines or periods of time), how the Likert-type scale and associated anchors of CB and DB worked and how to rate targeted behaviour.

Direct observations. In addition to the parents' recording on the IBRST, the author conducted observations in the family home at least once during baseline, at least four times at intervention, and once during follow-up. Observations were between 30-45 minutes in length during targeted family routines or times convenient for the family. At this time, the author took anecdotal notes on antecedents, behaviour and consequences and gathered data according to IBRST measures chosen by the family (i.e. frequency, intensity, duration or percentage of time). Direct observations were used to support information reported by parents, increase accuracy of the FBA and reduce the chance of inaccurately identifying the function of CB (McIntosh, Brown & Borgmeier, 2008).

Intervention: PTR-F procedure adherence. To measure the team's adherence to each step of the PTR-F procedure, the author completed three Self-Evaluation Checklists (Appendices I, J & K) with teams at the end of Step 1 and 2 'Initiating the PTR-F Process', Step 3 'Assessment', and Step 4 'Intervention'. Overall the Self-Evaluation Checklists included 18 steps and used a yes/no format. A checklist was completed by teams at the end of each team meeting for Initiating the PTR-F Process, Assessment and Intervention.

Intervention: Universal home practices implementation fidelity. Family adherence to universal home practices was measured using the Universal Practices Fidelity of Strategy Implementation Form (Appendix L) adapted by the author from the PTR-F Fidelity of Strategy Implementation Form (Dunlap et al., 2017). This measure assessed the extent to

which parents implemented the four universal home practices consistently and accurately. This form focused on examining the parents' ability to implement PTR-F universal home practices reliably and correctly. This form was completed by the author during two direct observation visits throughout the universal phase. If families were not implementing with at least 80% fidelity, the author provided families with additional coaching and feedback. Feedback sessions were between 15-20 minutes in length and in person to review the progress of child behaviour and fidelity of implementation and address any issues. The author also checked in with families at least once a week or as needed via phone to review progress.

Intervention: Implementation fidelity. Family adherence to intervention was measured using the PTR-F Fidelity Strategy of Implementation Form (Appendix M; Dunlap et al., 2017). This measure assessed the extent to which parents implemented the steps in the PTR-F BIP consistently and accurately. The author conducted weekly observations using the PTR-F Fidelity of Strategy Implementation Form. Each family also had a copy of this form and used it as a self-evaluation tool. This form was completed by the home during direct observation visits throughout intervention phases. The Universal Fidelity of Strategy Implementation Form and PTR-F Fidelity of Strategy Implementation Form were reviewed when concerns regarding the implementation process were raised. If families were not implementing intervention steps with at least 80% fidelity, the author provided families with additional coaching and feedback. Feedback sessions were between 20-30 minutes in length and were conducted in person to review the progress of child behaviour and parental fidelity, and address any issues. The author also checked in with families at least once a week or as needed via phone to review progress.

The PTR-F Process

Initial meeting. During the initial meeting, the author went through the information form and consent forms with parent(s)/caregiver(s) so they could ask questions about the project. The author reviewed the PTR-F steps briefly, including a description of the coaching process. The author asked the family to think about including anyone else in the process who might also find the behaviour challenging, such as grandparents, aunts and uncles. No families chose to involve additional members. Consent forms were completed after the initial meeting to give time for parents to discuss the project with their child and their assent. Consent forms were collected from family homes at the request of parents upon completion. Parents were requested to complete a demographic questionnaire for each family. The demographic questionnaire took approximately 10 minutes to complete. Once consent forms were completed, the author scheduled the next meeting at a time convenient for parents.

The five step PTR-F process is outlined in Dunlap et al. (2017). Each step typically involves a meeting that ranged from 30 to 90 minutes. Meetings were scheduled at times preferred by team members. The length of time between the start and end of the intervention process varied depending on the families short term goals.

Step One and Two: Establishing a team and goal setting. The team(s) consisted of each child's mother, father and the author. After the initial meeting, the teams met for between 60-90 minutes to discuss long- and short-term goals using the PTR-F Goal Sheet (Appendix N) and design the IBRST behaviour rating scale.

The teams chose how they would measure targeted behaviour and designed anchors using the IBRST form (Appendix H). Parents were requested to complete the in-home PTR-F Assessment Checklists (Appendices O, P, Q) before the next meeting. PTR-F Assessment

Checklists assess antecedent (*Prevent*), behaviour (*Teach*) and consequence (*Reinforce*) components of targeted behaviour

Before the next meeting, the author completed a home observation for 30-50 minutes during targeted routines or times convenient for the family.

Step Three: Universal home practices and FBA assessment. The third meeting commenced one week after the second meeting. Teams completed the Home Profile of Challenging Behaviour (Appendix R). This profile included 8 “yes/no” questions and focused on understanding the role of CB in the home setting. If teams answered “yes” to at least two questions on the Home Profile for Challenging Behaviour, parent teams completed the Home Practices Assessment (Appendix S). This assessment had four “yes/no” questions relating to the four universal practices in the home. This identified universal home practices to focus coaching on during the universal practices phase. The Home Profile for Challenging Behaviour was adapted from the PTR-YC Classroom Profile for Challenging Behaviour and the Home Practices Assessment was adapted from the PTR-YC Classroom Practices Assessment by the author (Dunlap et al., 2013).

Teams reviewed FBA information gathered by parents via the three PTR-F Assessment Checklists. Each PTR-F Assessment Checklist focuses on gathering information about the antecedents (*Prevent*), behaviour (*Teach*), and consequences (*Reinforce*). The *Prevent* Checklist has five questions to identify when and where CB occurs and with whom CB occurs. The *Teach* Checklist has three questions that focus on teaching replacement behaviours. These questions highlight possible social, problem-solving or communication skills intervention can assist in teaching the child a replacement to CB. The *Reinforce* Checklist has nine questions to identify the consequences of CB and the possible function(s) of CB. Three additional questions highlight possible positive reinforcers (i.e. rewards and praise) teams could use in intervention. Using parental responses to the checklists, along with

information gathered by the author during direct observations, each team completed the PTR-F Assessment Summary Table (Appendix T) and developed a hypothesis statement (refer to Table 5).

Teams also identified a DB to target for intervention. Definitions of targeted DB can be found in Table 5. Parent teams chose measures and designed IBRST anchors for DB.

Baseline. Three baseline measures were completed. Firstly, parents were requested to complete data recording using the IBRST defined behaviours (desirable and challenging) as selected by teams. Baseline was completed for a minimum of five days, or until a stable trend was identified. At this time the author undertook at least one direct observation in the home setting to observe child behaviour.

Universal home practices. This phase was incorporated into the PTR-F intervention to address limitations in previous PTR-YC and PTR-F research. Both PTR manuals (Dunlap et al., 2013; Dunlap et al., 2017) highlight the need for universal practices (home/classroom-wide) to be implemented before the function-based intervention begins, with the intention that behaviour may decrease when universal practices are implemented and/or to support the implementation of the intervention strategies.

In this current project, upon completion of the Home Practices Assessment, PTR-F universal home practices were implemented for all three families. This consisted of the author providing the family teams with at least one hour of coaching on practices highlighted during the Home Profile of Challenging Behaviour and Home Practices Assessment. The four PTR-F universal home practices were:

- 1) High number of positive attention and praise to the child. Coaching included information on positive attention/praise, such as what is positive attention/praise, when to use positive attention/praise, where and how to use positive attention/praise;

- 2) Establish and maintain a predictable daily routine. Coaching included establishing family routines and teaching implementation of family routines using visual schedules. Parents identified opportunities in the daily routine where positive praise could be used and developed praise statements they could use;
- 3) Develop consistent routines within the daily routine. Coaching consisted of identifying activities within daily routines that children can have an active role in participating in;
- 4) Clearly define behaviour expectations and teach desired behaviour expectations. Coaching included identifying appropriate home behaviour expectations and support around how to explicitly teach behaviour expectations. These behaviour expectations formed the foundation of things parents could praise (Dunlap et al., 2017).

Coaching used techniques such as rehearsal, modelling, problem solving, side-by-side support, environmental arrangement, observation and feedback to assist in coaching teams.

During the universal practices phase, parents were requested to complete at least seven days of data recording using the IBRST measures. The author completed two direct observations over the universal practices phase to review child behaviour and fidelity of universal home practices using the Universal Fidelity of Strategy Implementation Form. Additional coaching was provided to parents whose implementation scores fell below 80% during the universal practices phase. If significant change was seen in targeted behaviour (e.g. CB decreased and/or DB increased) the universal practices phase continued. If parents were not satisfied with targeted behaviour change, for instance, there was little or no behaviour change, teams began the intervention process. The universal practices phase continued for at least seven days or until teams had developed PTR-F BIP's and coaching on intervention strategies was provided.

Step Four: Intervention planning, coaching and implementation. For all three children it was necessary to develop a PTR-F BIP. This was developed using information gained in the PTR-F Assessment. The teams identified at least one strategy from the PTR-F intervention guide (Dunlap et al., 2017) of most common and effective evidence based strategies (see Table 5). Using the PTR-F Behaviour Support Plan Summary (Appendix U), each team developed implementation steps for each strategy.

Before intervention commenced, the author provided 60-90 minutes of individualised coaching to parents on the intervention steps in the home environment. Coaching sessions included modelling, side-by-side support, rehearsal, and feedback.

Upon completion of coaching, teams began implementation of intervention. The author completed a direct observation once a week for at least 4 weeks to review child behaviour and measure fidelity of implementation using the PTR-F Fidelity of Strategy Implementation Form. The researcher used the PTR-F Coach Planning and Reflection Log (Appendix V) to review progress, provide feedback and additional coaching as needed. The author contacted each team at least once a week via phone to review their progress, address any concerns and schedule additional meetings as needs arose. The intervention phase continued for at least 4 weeks.

Additional coaching sessions were provided to teams if implementation scores fell below 80% during intervention.

Step Five: Using data and next steps. Teams monitored data to assess the progress of child outcomes. Teams continued with intervention if data was showing favourable progress. However, if data showed unsatisfactory progress, teams investigated whether interventions steps were being implemented with at least 80% fidelity, whether the reinforcers were effective, and the function of target behaviour was appropriate. Adjustments were made to PTR-F BIPs as needed.

Follow-up. The purpose of follow-up was to examine the maintenance of behaviour outcomes and implementation fidelity once the author had withdrawn. At the conclusion of intervention, each team continued to collect data for seven days using the IBRST measures. The author completed a direct observation at the end of follow-up to ensure reliability of data and review fidelity of implementation. Each team met to review the child's progress, discuss the PTR programme, complete the PTR Social Validity Form and discuss next steps for their child.

Social validity. The PTR Self-Evaluation for Parents/Caregivers: Social Validity Form (Appendix W) was a 15-item scale adapted by the author from the PTR Self-Evaluation: Social Validity Form (Dunlap et al., 2013). The scale used a 5-point Likert-type scale with 1 indicating the programme was 'not at all acceptable, not at all confident, unlikely' with 3 indicating 'neutral', and 5 indicating 'very acceptable, very confident, very likely'. The measure was completed by each parent at follow-up to assess their perspectives on PTR-F.

Reliability. To ensure reliability of data collection during intervention, the author visited each team at least four times to observe the child's behaviour independently from the parents. The author's observation data were compared to each team's IBRST data.

Assessment Outcomes and Treatment Procedures

Details of the long- and short-term goals, CB, DB, IBRST ratings, hypothesis statement, and intervention plans are presented for all three children in Table 5.

Luke: Long- and short- term goals. Luke's team consisted of his mother, father and the author. Luke's long term goals were to learn self-management skills, and gain social and

communication skills necessary for school success. Two short term goals were identified. The first was to improve Luke's non-compliant behaviour, and was to improve Luke's aggressive play with toys. Luke's short-term goal was to target Luke's non-compliant behaviour, as this was the greatest concern for Luke's parents'.

Challenging behaviour. Non-compliant behaviour was as the target of intervention. Non-compliant behaviour was operationally defined as 'ignores request or resists by changing the subject of conversation or runs away'.

Desirable behaviour. Complaint behaviour was identified as the DB to target. This was operationally defined as 'following an instruction within 10 seconds'.

IBRST. Non-compliant behaviour was measured using frequency data recordings. Anchors were defined as 5 = non-compliant 20+ times, 3 = non-compliant 10-14 times, 1 = non-complaint 0-4 times. Desirable behaviour was measured using frequency of occurrence. Anchors were defined as 5 = 20+ times, 3 = 10-14 times, 1 = 0-4 times. Target behaviours were identified as occurring throughout the day, therefore they were measured from the time he woke up (6:30am) until the time he went to bed (7:00pm). It is important to note that three days a week Luke attends preschool from 8:00am-5:00pm. On those days, behaviour was measured before and after preschool. It was decided that Luke's mother would record data. Evenings were identified as the best time to complete the IBRST.

Table 5: PTR-F Intervention Summary Table for all three participants

Child	Long-term and short-term goals	Challenging behaviour	Desirable Behaviour	IBRST	Hypothesis Statement	Intervention 1	Intervention 2 (Modification to PTR-F BIP)
Luke	<p>Long-term: Learn self-management skills, follow rules and instructions, and gain social and communication skills.</p> <p>Short-term: decrease non-compliant behaviour</p>	<p>Non-compliance: Ignores request or resists by changing the subject of conversation or running away.</p>	<p>Compliant behaviour: Follows an instruction within 10 seconds.</p>	<p>Challenging behaviour (CB): 5 = non-compliant 20+ times. 3 = non-compliant 10-14 times. 1 = non-compliant 0-4 times.</p> <p>Desirable behaviour (DB): 5 = compliant 20+ times. 3 = compliant 10-14 times. 1 = compliant 0 times.</p>	When Luke is requested to do something at any time of the day then he engages in non-compliant behaviour (refer to operational definition) as a result escapes non-preferred activities and gains attention from parents.	<p>Prevent: Use of timers, change how instructions are given and what is explicitly being asked.</p> <p>Teach: Independence using visual schedules.</p> <p>Reinforce: Provide reinforcer for DB; and remove reinforcer from CB.</p>	<p>Prevent: Social story, alter physical arrangement of environment (day 64)</p> <p>Teach: Consistent bed time, (day 64)</p> <p>Reinforce: Altered reinforcers for DB, remove reinforcer from CB/undesirable side effect (day 36/64), reinforce desirable bed-time behaviour (day 64).</p>
Oliver	<p>Long-term: Learn social skills and academic skills.</p> <p>Short-term: Decrease tantrum behaviour</p>	<p>Tantrum behaviour: Cries persistently, verbally repeats what he wants, drops to the floor and head bangs.</p>	<p>Redirect to preferred activity: Redirect to preferred activity and engagement in this activity.</p>	<p>CB: 5 = 5+ tantrums. 3 = 3 tantrums. 1 = 0 tantrums.</p> <p>DB: 5 = 100% of the time. 3 = 50% of the time. 1 = 0% of the time.</p>	When Oliver is denied something he wants throughout the day then he engages in tantrum behaviour (refer to operational definition) as a result Oliver gains attention from his parents or the desired item.	<p>Prevent: Providing choices, visual schedule of routine.</p> <p>Teach: Delay of reinforcement.</p> <p>Reinforce: Reinforce DB; and remove reinforcer from CB.</p>	<p>Prevent: Social story (day 67).</p> <p>Teach: Consistent bed time (day 67).</p> <p>Reinforce: Reinforce desirable bedtime behaviour, remove reinforcer CB (day 67).</p>

Finn	<p>Long-term: Learn social skills and academic skills (i.e. concentration and attention), and improve language skills.</p> <p>Short-term: Decrease tantrum behaviour</p>	<p>Tantrum behaviour: Crying, throwing objects, verbal threats (i.e. you are not coming to my party, I'm not your friend), property destruction, kicking, hitting and biting.</p>	<p>Compliance to parents' request: Stopping an activity within 10 seconds.</p>	<p>CB: Intensity 5 = really loud crying/screaming, can't calm himself down without assistance, tense body, physical aggression (i.e. hitting kicking). 3 = crying/screaming, listen to reason, no physical aggression. 1 = no tantrums.</p> <p>Duration 5 = 10+ min. 3 = 5-7 min. 1 = 0-1min.</p> <p>Frequency 5 = 4+ tantrums. 3 = 2 tantrums. 1 = 0 tantrums.</p> <p>DB – 5 = 0-1mins. 3 = 5-7 mins. 1 = 10+ mins.</p>	<p>When preferred activities stop or delayed then Finn engages in tantrum behaviour (refer to operational definition) as a result, he gains attention from his parents.</p> <p>When Finn is told “no” then he engages in tantrum behaviour (refer to operational definition) as a result he gains attention from his parents or the desired item.</p>	<p>Prevent: Provide choices, use of timers, enhance predictability with schedules.</p> <p>Teach: Teach a coping strategy.</p> <p>Reinforce: Provide DB, remove reinforcer from CB.</p>	N/A
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Hypothesis statement. From information obtained from the PTR-F Assessment Checklists and a 40 minute home observation, a hypothesis statement was developed. Luke's hypothesis statement for CB is 'when Luke is requested to do something he does not want to do at any time of the day then he engages in non-complaint behaviour and as a result escapes non-preferred activities and gains attention from parents.'

Universal home practices. One universal practice was identified as the focus for the universal practices phase and that was to increase praise to Luke. The author provided a one hour coaching session to Luke's parents' a week after the third meeting. Coaching consisted of teaching Luke's parents' about high ratios of positive attention/praise, and identifying opportunities for positive attention/praise using modelling, rehearsal, and feedback. During the universal practices phase the author completed two direct observations to measure parent's implementation fidelity of universal home practices.

Intervention 1. The team created a PTR-F BIP using FBA and direct observation information. Using the PTR-F Behaviour Plan Summary and PTR-F intervention guide, the team developed a PTR-F BIP. Three *prevent* strategies were identified: 1) use of timers, which consisted of giving Luke a five minute warning paired with a visual timer before the transition from a desirable routine/activity to an undesirable routine/activity; 2) changing how instructions are given. This involved parent's approaching and gaining Luke's attention before instructions were given in a clear and calm voice; and 3) changing what is explicitly being asked, which involved rephrasing instructions into simple, explicit statements (i.e. "tidy up your toys and put them in the box."). Teaching independence using visual schedules was chosen as the *teach* strategy. This consisted of using a visual schedule to teach him the steps of two activities (apply sunscreen and pack his school bag) within the daily routine to support him in completing these tasks independently. The *reinforce* component included: 1)

reinforcing complaint behaviour, which consisted of Luke receiving positive verbal praise, a mini MnM and a sticker immediately for DB. Upon receiving 5 stickers, Luke received 15 minutes of TV/iPad time; and 2) remove attention from parents by ignoring challenging behaviour. Luke's PTR-F BIP had a total of 12 steps.

Intervention 2: Modifications to PTR-F BIP. During intervention, amendments were made to Luke's PTR-F BIP due to an escalation in his CB and an undesirable side-effect (aggressive behaviour, i.e. hitting, kicking, head butting, throwing objects, and spitting) over the holidays. This included: 1) changing positive reinforcers to a jet plane lolly and decreasing the amount of stickers needed to gain TV/iPad time, and increasing TV/iPad time to 20 minutes; and 2) ignoring CB/aggressive behaviour. His PTR-F BIP was also amended a second time as Luke began to demonstrate aggressive behaviour during his bedtime routine. Amendments included: 1) introducing a bedtime social story to support both children in understanding the behaviour expectations and steps within their bedtime routine; 2) altering physical arrangement of the environment; 3) altering Luke's bedtime routine by changing his bed time and consistently returning him to bed with minimal social attention; 4) reinforcing desirable bedtime behaviour (i.e. lying down in bed with no CB) and removing attention for aggressive behaviour.

Coaching. The researcher provided 90 minutes of individualised coaching to Luke's mum on the intervention steps in the home environment. Coaching consisted of rehearsal, side-by-side support, modelling and feedback to guide her through the steps of each intervention strategy. A 30 minute coaching session was also provided to Luke's father to ensure consistency of steps from each parent. One additional coaching session (day 64), 90 minutes in length was provided to Luke's mother and father to support them achieving at least 80% accuracy on intervention steps and to teach supplementary strategies for Luke's

bedtime routine. Additional coaching consisted of observation, side-by-side support, modelling, problem solving and feedback. The author also contacted Luke's parents' on average every second day via phone to discuss progress and address any concerns.

Oliver: Long- and short-term goals. Oliver's team consisted of his mother and father and the author. The long-term goals identified for Oliver were learning social skills to initiate and maintain friendships and learn academic skills (i.e. maintain attention to complete tasks) to do well at school.

Challenging behaviour. The team identified tantrum behaviour as their short term goal. This was the targeted behaviour and was operationally defined as 'cries persistently, verbally repeats what he wants, drops to the floor, and head bangs.'

Desirable behaviour. Redirect to preferred activity was identified as the DB to target. This was operationally defined as 'redirect to preferred activity and engagement in this activity'.

IBRST. Challenging behaviour was measured using frequency recordings. Anchors were defined as 5 = 5 + tantrums, 3 = 3 tantrums, 1 = 0 tantrums. Desirable behaviour was measured using percentage of time behaviour was present over the observation period. Anchors were defined as 5 = 100% of the time, 3 = 50% of the time, 1 = 0% of the time. Targeted behaviour was identified as occurring throughout the day, from the time he woke up (6:00am) to the time he went to sleep (7:00pm). Oliver attends preschool two days a week from 8:30am-4:30pm. On those days, target behaviour was measured outside preschool hours. Oliver's mother opted to recorded data, completing the IBRST in the evenings.

Hypothesis statement. Using information from the PTR-F Assessment Checklists and a 40 minute home observation the team developed a hypothesis statement. Oliver's hypothesis statement was 'when Oliver is denied something he wants throughout the day then he engages in tantrum behaviour and as a result, Oliver gains attention from his parents or the desirable item.'

Universal home practices. The team identified high rates of positive attention/praise and teaching behaviour expectations as the focus of the universal phase. The author provided Oliver's mother with a one hour coaching session. Coaching included information on high rates of positive attention/praise. With the author, Oliver's mother also identified their home behaviour expectations. Coaching included modelling, side-by-side support and feedback to assist Oliver's mother in identifying opportunities to use high rates of positive attention/praise and teach behaviour expectations.

Intervention 1. The team developed a PTR-F BIP using FBA and direct observation information. Using the PTR-F Behaviour Plan Summary and PTR-F intervention guide, the team identified two *prevent* strategies: 1) providing choices, this involved giving Oliver an opportunity to select from two to four food choices for breakfast and snacks; and 2) enhance predictability of his daily routine with visual schedules, which consisted of showing Oliver the visual picture of each step, before completing each step of his routine. Teaching delay of reinforcement was chosen as the *teach* strategy. This involved teaching Oliver to wait for reinforcement (i.e. attention from parent or desirable item) by redirecting Oliver to a preferred activity and using a timer to provide a 5 minute warning for reinforcement. *Reinforce* strategies included: 1) reinforcing Oliver's DB with positive praise and an animal stamp; and 2) and removing parent attention and desirable item from CB. Oliver's PTR-F BIP had a total of 13 steps.

Intervention 2: Modifications to PTR-F BIP. During intervention, Oliver's PTR-F BIP was reviewed and changes were made in response to escalating CB during his bedtime routine. Revisions included: 1) introducing a bedtime social story to support Oliver's in understanding the behaviour expectations and steps within their bedtime routine; 2) altering Oliver's bed time and consistently returning him to bed with minimal social interaction; 3) reinforcing desirable bedtime behaviour (i.e. lying down in bed quietly without CB); and 4) removing reinforcer from CB.

Coaching. The researcher provided 60 minutes of individualised coaching to Oliver's parents' on the intervention steps in the home environment. The author provided side-by-side support, modelling, rehearsal and feedback to guide them through the steps of each intervention strategy. Oliver's mother was provided with two additional coaching sessions (days 37 and 51) and Oliver's father was provided with one additional coaching session (day 37) in order to implement strategies with at least 80% fidelity. A third coaching session was required at day 67 to teach supplementary strategies in Oliver's bedtime routine. Additional coaching sessions were between 20 to 90 minutes in length and consisted of problem solving, side-by-side support, observation, modelling and feedback. The author also contacted Oliver's parents' once a week via phone to discuss progress and address concerns.

Finn: Short- and long term goals. The team identified long term goals as learning social skills to build friendships with children his age, learn academic skills (i.e. concentration and attention) to achieve at school and improve his language skills. Finn's short term goal was identified as reducing his engagement in tantrum behaviour when having to stop a preferred activity or denied desirable items.

Challenging behaviour. Tantrum behaviour was chosen as the target behaviour. This was operationally defined as ‘crying, throwing objects, verbal threats, property destruction, kicking, hitting and biting’.

Desirable behaviour. Compliance to parent’s request was identified as the target behaviour. Compliance to parent’s request was operationally defined as ‘stopping an activity within 10 seconds’.

IBRST. Challenging behaviour was measured using intensity of tantrum behaviour. Anchors were defined as 5 = really loud crying/screaming, can’t calm himself down without assistance, tense body, physical aggression (i.e. hitting kicking), 3 = crying/screaming, listen to reason, no physical aggression, 1 = no tantrums. Tantrums were also measured using frequency of occurrence (5 = 4 + tantrums, 3 = 2 tantrums, 1 = 0 tantrums) and duration of overall time tantrum behaviour lasts (5 = 10+ minutes, 3 = 5-7 minutes, 1 = 0-1 minute). These additional measures were collected to provide supplementary information on CB. Desirable behaviour was measured using duration of overall time it takes for Finn to comply with parent’s request. Anchors were defined as 5 = 0-1 minutes, 3 = 5-7 minutes, 1 = 10+ minutes. Target behaviour was identified as primarily occurring after preschool, between 4:00pm-7:30pm. Finn’s father opted to recorded data, completing the IBRST in the evenings.

Hypothesis statement. Using information from the PTR-F Assessment Checklists and a 50 minute home observation the team developed two hypothesis statements. Finn’s hypothesis statements were ‘when preferred activities stop or are delayed then Finn engages in tantrum behaviour as a result he gains attention from his parents’ and ‘when Finn is told ‘no’ then he engages in tantrum behaviour as a result he gains attention from his parents or the desired item.

Universal home practices. The team identified teaching behaviour expectations as the focus of the universal phase. The author provided Oliver's parents' with a one hour coaching session. Coaching included identifying behaviour expectations, teaching strategies to explicitly teach behaviour and information around high rates of positive attention/praise. The author used modelling, side-by-side support, problem-solving and feedback to assist Finn's parents' in identifying opportunities to teach behaviour expectations and use of high ratios of positive attention/praise.

Intervention 1. The team developed a PTR-F BIP using FBA and direct observation information. Using the PTR-F Behaviour Plan Summary and PTR-F intervention guide, the team identified three *prevent* strategies; 1) providing choices, which involved giving Finn the choice of two desirable activities he could transition to, or the choice of order of routines within daily routines (i.e. brush teeth first or get dressed first); 2) use of timers to provide a five minute warning paired with a visual timer before the transition from a desirable routine/activity to an undesirable routine/activity; 3) and enhance predictability with visual schedules, which consisted of showing Finn the visual picture of each step, before completing each step of his routine. Teaching a coping strategy was chosen as the *teach* strategy. This involved Finn learning to cuddle his toy kangaroo when he was frustrated, angry or sad. *Reinforce* strategies included: 1) reinforcing Finn's compliance to parent's request with positive praise and a mini MnM; and 2) removing parent attention and desirable item for CB. Finn's PTR-F BIP had a total of 18 steps.

Coaching. The author provided 90 minutes of individualised coaching to Finn's mother on the intervention steps in the home environment during the target routine. His father was provided with 20 minutes coaching. The author used side-by-side support, modelling and feedback to guide them through the steps of each intervention strategy. His mother was

provided with one additional coaching session, 20 minutes in length, which consisted of feedback and problem-solving. The author also contacted his parents via phone once a week to discuss progress and address concerns.

Data Analysis

Data analysis occurred on the demographic questionnaire, IBRST observation forms, Fidelity of Implementation Forms, reliability and the Social Validity Questionnaire.

Demographic questionnaire. The information from this questionnaire was collated and presented in Table format.

PTR Procedure adherence. The author completed three Self-Evaluation Checklists for 15 steps of the PTR-F programme. Procedural adherence was calculated using the equation [number of steps completed/total number of steps]. This was presented in Table format.

IBRST data. IBRST data was undertaken by each parent and was recorded daily throughout baseline, universal practices and intervention 1 and 2 phases. Results are presented in individual line graphs for each child to allow for the visual analysis of data. Each graph documents CB and DB ratings during baseline, universal practices, intervention 1 and 2, and follow-up phases. Features in the data such as trend and changes in mean were measured to conclude whether behaviour change across phases were reliable.

Fidelity of implementation for universal home practices and intervention.

Universal practices and intervention implementation was observed by the author. Universal practices fidelity was represented as a percentage. Percentage of fidelity of universal practices implementation was calculated using the equation [Number of steps implemented

by parents correctly/Total number of steps of each universal practice]. Intervention fidelity was represented as a percentage. Percentage of fidelity of intervention implementation was calculated using the equation $[\text{Number of steps implemented by parents correctly}/\text{Total number of steps that were applicable for the routine}]$.

Reliability. IOA was calculated by comparing parent ratings of behaviour to the author's ratings of behaviour during observation sessions. Frequency of behaviours i.e. number of non-compliant behaviour, was recorded as agreement if both the parent and author noted the behaviours occurrence, and disagreement if only one party noted the behaviour. Measures of duration, i.e. length of tantrum behaviour, were recorded as agreement if parent and author observations were within 2 minutes. Measures of intensity i.e. intensity of tantrum behaviour, were recorded as agreement if parent and author observations were perceived as the same. Percentage of agreement for each behaviour was calculated using the equation $[\text{Agreements}/ (\text{Agreements} + \text{Disagreements})] \times 100$.

Social validity questionnaire. This questionnaire was analysed by recording individual scores and collating the means of the parent scores in a Table format.

Chapter Four

Results

Chapter four presents data on targeted challenging behaviour (CB) and desirable behaviour (DB) for Luke, Oliver and Finn. Baseline, universal home practices, intervention 1 and 2, and follow-up data are presented on child behaviour outcomes, fidelity of implementation, procedural adherence, reliability, and social validity.

Child Behaviour

Luke. Figure 2 presents IBRST findings of targeted CB and DB across baseline, universal practices, intervention 1 and 2, and follow-up phases for Luke. Also included in Figure 2 are recordings of parent fidelity observations, as denoted by the X symbol.

Baseline results for Luke showed an IBRST rating of 5 (with 5 being the highest possible rating for non-compliant behaviour) for CB across both baseline and universal practice phases. DB was variable at baseline with IBRST scores between 2 to 4 ($M = 3.3$) but increased during universal practices with scores ranging from 3 to 5 ($M = 4$). On the first day of intervention (Intervention 1), CB decreased to an IBRST rating of 1, this corresponded with a decrease in DB for two days (IBRST rating of 2). There was minimal variance in CB from days 30 to 35 (IBRST ratings between 1 and 2). DB increased on day 32 to an IBRST rating of 5 and remained stable for the next three days (IBRST rating of 4). However, on day 36 Luke's CB increased for the next six days (IBRST rating between 3 and 4), yet remained below baseline levels. DB showed variability (IBRST ratings between 2 and 4) between days 36 to 42. On days 43 and 44 CB decreased to an IBRST rating of 1, however increased to an IBRST rating of 3 on day 45. From day 47, Luke's CB decreased and remained stable (IBRST ratings between 1 and 2) for the next 11 days. However, between days 58 to 64 his

CB increased to IBRST ratings between 2 and 3 for seven days. Between days 43 to 64, DB remained stable (IBRST ratings between 2 and 3), with the exception of days 52 and 62 in which DB spiked to IBRST ratings of 4 and 5 respectively ($M = 2.8$).

Intervention 2 was introduced on day 65. This resulted in a decrease in CB for two days (IBRST rating of 1). Despite the implementation of these additional strategies, Luke's CB remained variable for the remaining days of intervention (IBRST ratings between 2 to 3). In contrast, Luke's DB increased to a score of 4 on day 66 but then was variable with scores of 2, 3, and 4 ($M = 2.7$). At follow-up both CB and DB stabilised with scores of 2 and 3 where an inverse relationship occurred between CB and DB.

Oliver. Figure 3 presents parent recorded IBRST ratings across baseline, universal practices, intervention 1 and 2, and follow-up phases for Oliver. Also included in Figure 3 are recordings of parent fidelity observations, as denoted by the X symbol.

Results indicate that Oliver's CB varied during baseline with IBRST ratings ranging from 1 to 5 ($M = 3.3$). His DB was stable with IBRST recordings of 3 over the five days. During the universal practices phase Oliver's CB was variable with IBRST ratings between 2 to 5 ($M = 3.7$) as was his DB with IBRST ratings between 2 and 4 ($M = 2.9$). The intervention phase (Intervention 1) commenced on day 31, with CB remaining stable at an IBRST rating of 5 for 25 days with the exception of day 45 (IBRST rating of 4). DB remained stable for 14 days (days 31 to 44), before increasing to an IBRST rating of 3 at day 45. DB remained stable for the next 10 days. On day 56, CB decreased to an IBRST rating of 3 and DB increased to an IBRST rating of 4. Between days 56-66 there was variability in CB with IBRST ratings between 3 and 5 ($M = 4.7$) and stability in DB with a score of 4.

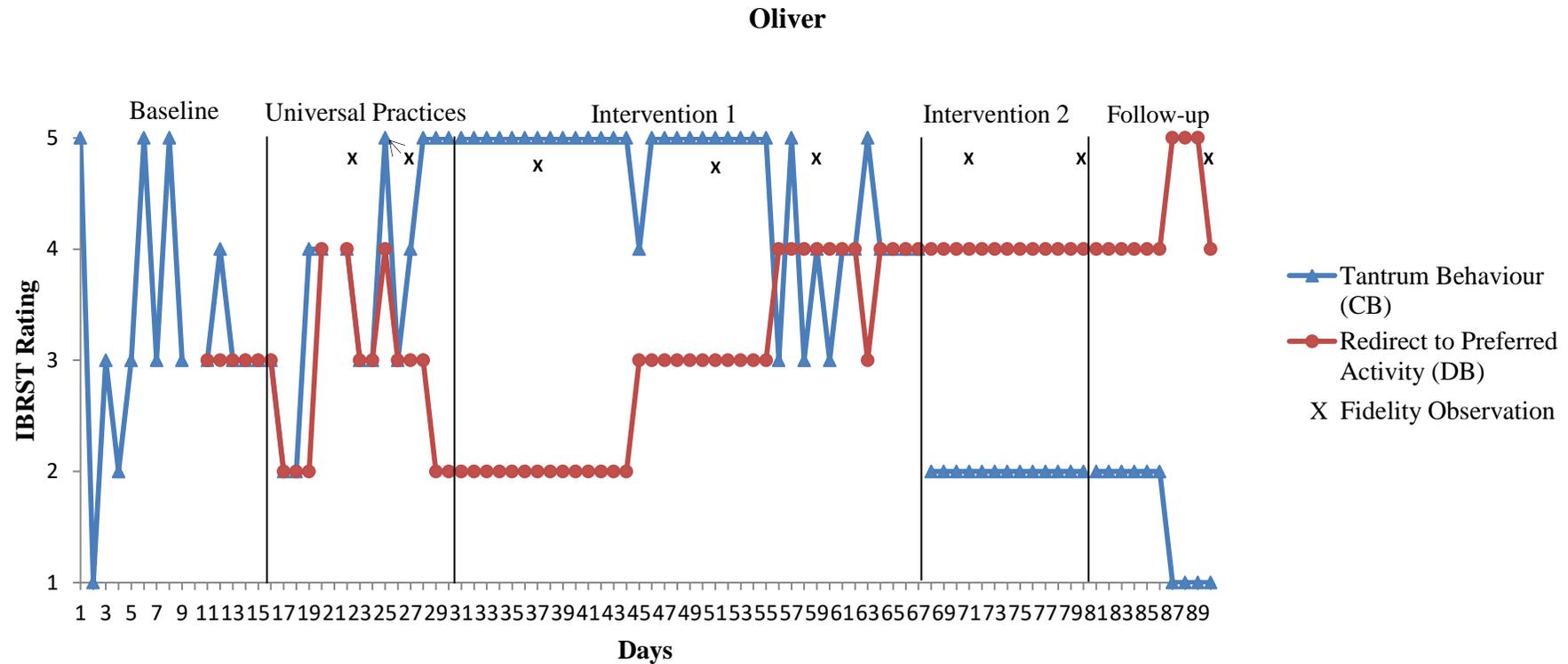
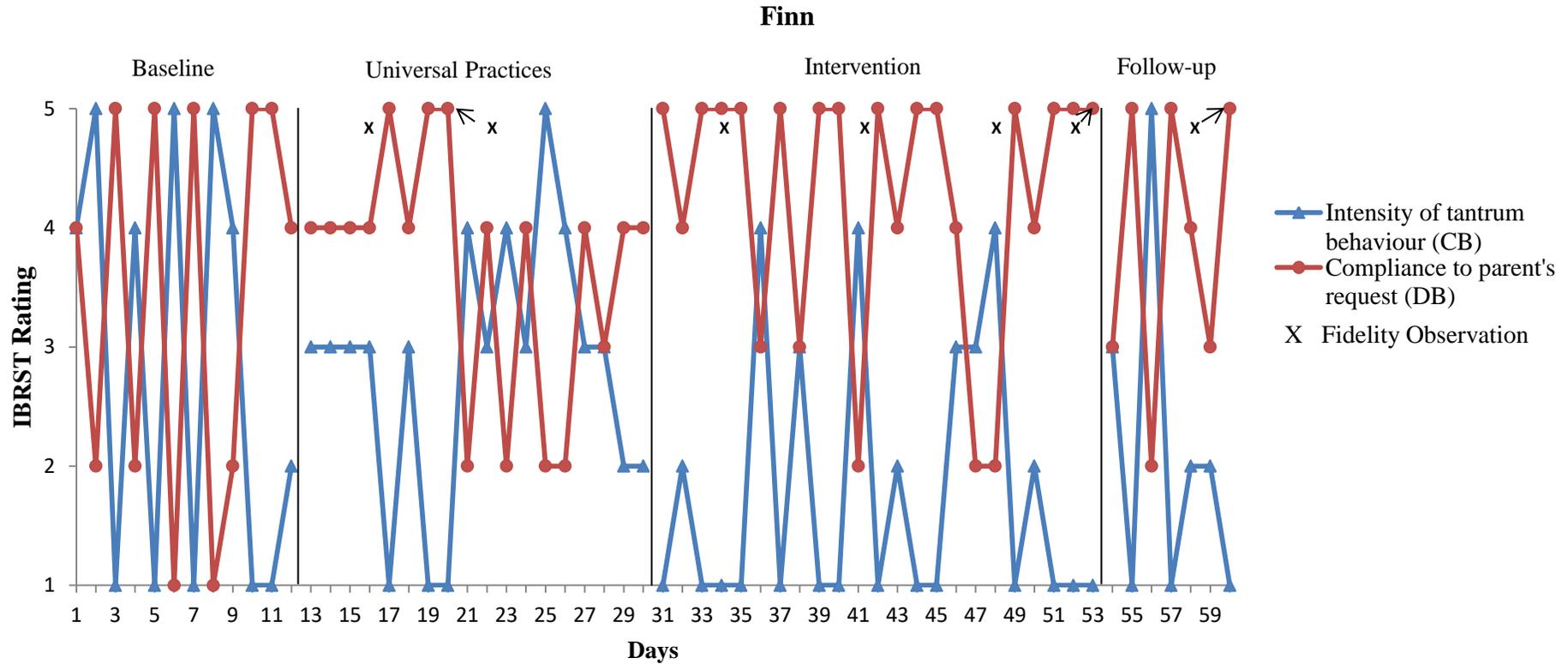


Figure 3: Oliver's IBRST parent ratings for tantrum behaviour (targeted challenging behaviour [CB]) and redirect to preferred activity (targeted desirable behaviour [DB]) to parent requests during baseline, universal practices, intervention 1 and 2 and follow-up phases, and the days parent fidelity observations were carried out.

On day 68, Intervention 2 was introduced, providing an immediate decrease in CB to an IBRST rating of 2; a decrease which remained stable for 13 days and resulted, at follow-up, with zero occurrences of CB (IBRST rating of 1). In contrast, during Intervention 2, there was an increase in DB to a consistent score of 4 across this phase and during follow-up, DB increased to scores of 4 and 5 (mean = 4.3).

Finn. Figure 4 presents IBRST data for Finn's CB and DB across baseline, universal practices, intervention, and follow-up phases. Also included in Figure 4 are recording of parent fidelity observations, as denoted by the X symbol. In addition, at the bottom of the figure, is a table representing parental IBRST ratings of Finn's frequency and duration of his CB across phases.

The results indicate that, across the baseline phase Finn's CB and DB was variable with IBRST ratings between 1 to 5 ($M = 2.7$ and 3.3 respectively). During the first 8 days of universal practices, Finn's CB decreased to scores of 1 to 3 and his DB increased to IBRST ratings of 4 and 5 ($M = 2.3$ and 4.4 respectively). However over the following 8 days there was an increase in CB ($M = 3.6$) and a decrease in DB ($M = 2.9$), before CB decreased (IBRST rating of 2) and DB increased (IBRST rating of 4) for the remaining 2 days. During the intervention phase, Finn's DB increased and remained between scores of 3 to 5 ($M = 4.3$) with the exception of 3 days where his IBRST rating was 2. In contrast, Finn's CB decreased to scores of 1 to 2 with 14 days of no tantrum behaviour ($M = 1.8$). The exception of days 36, 38 and 41; his CB increased to an IBRST score of 4. This coincided with a decrease in DB. At follow-up, an inverse relationship can be viewed between Finn's CB and DB IBRST ratings between 2 to 5 ($M = 2.1$ and 3.8 respectively).



F	3	3	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	1	2	1	1	3	2	3	2	2	2	2	2	3	2	1	2	1	1	1	2	1	1	1	2	1	2	1	2	1	2	2	1													
D	4	5	1	4	1	5	1	5	4	1	1	1	2	2	2	2	2	1	2	1	1	5	2	4	2	4	4	4	2	4	3	2	1	2	1	1	1	3	1	3	1	1	5	1	2	1	1	2	4	4	1	2	1	1	1	2	1	4	1	2	3	1

Note: (F = Parental IBRST ratings of frequency of tantrums per day; D = Parental IBRST rating for duration of tantrum behaviour)

Figure 4: Finn’s IBRST parent daily ratings for intensity, duration and frequency of tantrum behaviour (targeted challenging behaviour [CB]), and compliance to parents requests (targeted desirable behaviour [DB]) during baseline, universal practices, intervention 1 and 2 and follow-up phases, and the days parent fidelity observations were carried out.

Figure 4 also presents the duration of the tantrums and the frequency of the tantrums as recorded by Finn's parents' in the IBRST 5 point scale. Baseline data for frequency of CB indicates that there was little variability in the number of tantrums Finn had each days (IBRST ratings between 2 and 3, with 2 indicating 1 tantrum, and 3 indicating 2 tantrums; $M = 2.3$). There were two periods (days 3 to 7 and days 10 to 12) when his frequency of CB remained stable (IBRST rating of 2). Data during the universal practices phase showed that his frequency of CB was variable with IBRST ratings between 1 and 2 from days 13 to 20, before increasing to IBRST ratings between 2 and 3 for the following 10 days. This represents no change in data ratings between baseline and universal practices phase. Intervention data resulted in a decrease in Finn's frequency of CB from baseline levels. Data over intervention showed little variability in his frequency of CB (IBRST rating between 1 and 2; $M = 1.5$). In particular, there were three periods when there was stability for three days (Days 33 to 35, 51 to 53 and 46 to 48). Follow-up data demonstrated that his frequency of CB was maintained, with little variability in IBRST ratings (between 1 and 2; $M = 1.6$).

Baseline data showed high variability in the duration of CB from day 1 to 9 (IBRST ratings between 1 and 5, with 5 indicating 8-10 minutes, 3 indicating XX minutes, 1 indicating 0-1 minutes, $M = 2.7$). However the last three days of baseline were stable (rating of 1). At the beginning of the universal practices phase, the duration of CB was stable for four days (IBRST rating of 2) however from day 17 to 30, there was high variability in the data (IBRST ratings between 1 to 5; $M = 2.6$). During universal practice phase, there was no change in duration of CB from baseline levels. During intervention there was variability in the duration of Finn's CB with IBRST ratings between 1 and 4, indicating a decrease in duration of CB from baseline levels ($M = 1.8$). Follow-up data shows variability each day in duration of CB (IBRST ratings between 1 and 4, mean = 2). These results indicate an increase in duration of CB from intervention but below baseline levels. Interestingly, data

indicated that his duration of CB was often associated with the intensity of his CB. That is, the higher the intensity of CB, the longer CB lasted.

Fidelity of Implementation

Fidelity of implementation of universal home practices and intervention strategies were recorded over the universal practices, intervention 1 and 2 and follow-up phases via the Universal Practices Fidelity of Strategy Implementation Form (refer to Appendix L) and PTR-F Fidelity of Strategy Implementation Form (refer to Appendix M). Each fidelity observation was approximately 60 minutes in length. Table 6 presents parent fidelity scores for all three parents.

Luke. Both parents of Luke scored above 90% fidelity in their two observations during the universal practices phase. Their fidelity of implementation remained high over the project with the exception of the fourth observation during intervention 1, when both parents fidelity rating decrease to below 80%. However, during intervention 2 and follow-up both parents fidelity of implementation increased back to universal phase recordings of above 90%.

Oliver. Both parents of Oliver scored above 90% fidelity in their two observations during the universal practices phase. Their fidelity of implementation was initially below 80% during intervention 1, with his mother's and father's fidelity increasing above 90% at the third and fourth observations respectively. During intervention 2 and follow-up their fidelity of implementation remained above 90%.

Finn. Both parents of Finn scored above 80% fidelity in their two observations during the universal practices phase. Their fidelity of implementation remained high over the

project with the exception of his mother's fidelity decreasing below 80% in the third observation. However, her fidelity of implementation increased back to universal practice phase recordings of above 90% and maintained at follow-up.

Table 6: Fidelity Scores for Parents for All Three Children at Universal Practices, Intervention 1 and 2 and Follow-up Phase.

	Luke		Oliver		Finn	
	Mother	Father	Mother	Father	Mother	Father
Universal Phase:	94	94	94	94	75	75
	100	100	94	100	88	88
Intervention Phase 1	89	N/A	27	27	80	91
	N/A	100	60	N/A	81	91
	100	N/A	100	N/A	63.5	90
	56	76			91	100
Intervention Phase 2	100	N/A	100	100		
			100	N/A		
Follow-up	95	N/A	100	92	92	100

*Scored as a percentage (%)

PTR-F Procedural Adherence

All teams completed the three PTR Self-Evaluation Checklists corresponding to PTR-F procedures of Step 1 and 2, 'Initiating the PTR-F Process', Step 3 'Assessment' and Step 3 'Intervention'. The overall results indicate each team completed all steps of PTR-F process with 100% adherence to procedures.

Reliability

Reliability data collected over 9 days for Luke and Oliver, and 8 days for Finn during baseline, universal practices, intervention 1 and 2 and follow-up. Parent IBRST recordings were compared to data collected by the author during direct observations for child behaviour and parent implementation fidelity.

Table 7 presents IOA scores for parental IBRST data recordings for all three parents. Overall, agreement for IBRST ratings of child behaviour was above the 80% acceptability level, ranging from 85% to 100% across all three parents (Cooper, Heron & Heward, 2007).

Social Validity

Results of the PTR-F Self Evaluation for Parents/Caregivers: Social Validity Form are displayed in Table 8 for all participating families. A score of 5 indicates the highest score, for example 'very acceptable', 'very willing' 'much time', 'many', while the lowest score (score of 1) indicates for example 'not at all acceptable', 'not at all willing', 'little time', 'none.'

Overall, all families showed high ratings of 4 to 5 (out of 5) on items of the 'acceptability of PTR-F', 'likability of PTR-F procedures', 'willingness to carry out PTR-F', 'willingness to change routines', 'fit into existing routine', 'effectiveness in teaching appropriate behaviour' and 'intervention goals aligning with family goals'.

Table 7: Interobserver Scores of Parental IBRST Data Recordings for Three Parents at Baseline, Universal Practices, Intervention 1 and 2 and Follow-up Phase.

	Baseline		Universal Practices		Intervention 1		Intervention 2		Follow-up		Total Mean
	Range	<i>M</i>	Range	<i>M</i>	Range	<i>M</i>	Range	<i>M</i>	Range	<i>M</i>	<i>M</i>
Luke (Mother)		62.5	60-100	80	88.9-100	97		100		100	88
Oliver (Mother)		100		100		100		100		100	100
Finn (Father)		100		100	75-100	94				100	98.5

*Scored as a percentage (%)

This result indicates that families were highly satisfied with the procedures of PTR-F and believed they fitted well in their daily life. However, there were some discrepancies in ratings between all three children's parents. Luke's parents' perceived PTR-F to be highly disruptive, with undesirable side-effects and high levels of child discomfort (ratings of 4 respectively).

This finding is in contrast to Oliver and Finn's parents' who perceived PTR-F to have minimal disruption to family life (ratings of 2 and 1, 1 and 3 respectively), undesirable side effects (ratings of 1 and 2 respectively) and child discomfort (ratings of 1 and 3, 1 respectively).

Of note, Oliver's father perceived PTR-F to cause more child discomfort (rating of 3), Finn's mother perceived more undesirable side effects (rating of 2) and Finn's father perceived PTR to be more disruptive (rating of 3) compared to their spouses ratings (rating of 1

respectively). Also, Oliver's father and Finn's mother perceived that PTR-F fitted better into their existing routine (rating of 4) compared to their spouses (rating of 5). Similarly, Luke's parents' perceived other family members to be less willing to implement PTR-F intervention (ratings of 2 to 3), compared to Oliver's and Finn's parents' (ratings of 4 to 5 respectively).

Interestingly, Luke and Oliver's mothers perceived PTR-F as highly effective in producing behaviour change (ratings of 4 and 5 respectively), and improvements would be permanent (ratings of 4 and 5 respectively), compared to their husbands who perceived PTR-F to be less effective in producing behaviour change and it would be permanent (both fathers ratings of 3 respectively). Between parents, Oliver's and Finn's mothers perceived that there would be a high amount of problems in undertaking PTR-F (rating of 4), while all fathers and Luke's mother perceived low to moderate problems (ratings of 2 to 3). Likewise, Luke's mother perceived that intervention required a lot of time (rating of 4), while Finn and Oliver's mothers and all fathers perceived that intervention required moderate to minimal time respectively (ratings between 2 to 3).

At follow-up, Luke's mother anecdotally reported that she felt more confident in her parenting and her relationship with Luke had improved. Oliver's parents' anecdotally reported that they felt Oliver was a lot happier and calmer, laughed more, and was beginning to try new things (e.g. new foods). His parents also reported that their marital relationship had improved, they felt more confident in their parenting and less stressed and as a family were happier. Similarly, Finn's parents' anecdotally reported that Finn seemed calmer, and other routines had become easier. They were no longer worried about his behaviour and Finn's mother felt more confident in her parenting, resulting in her feeling more comfortable in taking Finn out into the community by herself.

Table 8: PTR-F Social Validity Scores of Participating Families

Social Validity Items	Luke		Oliver		Finn	
	Mother	Father	Mother	Father	Mother	Father
Acceptability	5	4	5	5	4	4
Willingness	5	4	5	5	5	5
Problems undertaking PTR	2	3	4	3	4	2
Time needed	4	3	2	3	3	2
Effectiveness	4	3	5	3	5	5
Permanent improvements	4	3	5	3	5	5
Disruptiveness	4	4	2	1	1	3
Likability of procedures	4	4	5	5	5	5
Willingness of other family members	2	3	4	5	5	4
Undesirable side-effects	4	4	1	1	2	1
Child discomfort	4	4	1	3	1	1
Willingness to change routines	5	4	5	5	5	5
Contextual fit	4	4	4	5	5	4
Effectiveness in teaching appropriate behaviour	4	4	5	5	5	5
Intervention goals	4	5	5	5	5	4

Chapter Five

Discussion

The aim of this project was to firstly investigate the effectiveness of universal home practices and PTR-F intervention in teaching prosocial-emotional competence and decreasing persistent challenging behaviour in three young male children. Secondly, the project aimed to investigate the applicability of PTR within New Zealand settings. The three following aims were the focus of this project.

Effectiveness of the universal home practices

To address the first aim, the author measured targeted CB and DB during baseline and the universal practices phase. Overall results demonstrated that during this phase there was little or no change in targeted CB and DB for all three children, and this resulted in all three children requiring a PTR-F function-based intervention plan to meet their goals. The findings indicated that the universal home practices were not specific enough to address the function of the targeted behaviours (i.e. Luke = escape/delay undesirable routines/activities and attention from parents, Oliver and Finn = attention from parents and gain desirable item). The universal home practices did not adequately teach Oliver how to ‘redirect to preferred activity and engage in this activity’, and therefore he required a more targeted strategy to achieve this skill. Importantly, IBRST results for CB contrasted anecdotal parent reports from all three parents. They reported that CB improved following the implementation of universal home practices. Families also expressed that non-targeted CBs and/or routines appeared to improve as their child seemed calmer, and some parents felt more confident in their parenting. For example, Finn’s parents’ reported that he used fewer inappropriate words and Oliver’s mother reported that their morning routine seemed easier to complete and was less stressful.

Additionally this project found that universal home practices assisted in establishing a better baseline for individualised intervention. For example, the universal home practices phase assisted Oliver and Finn's families in establishing and teaching behaviour expectations which were not in their homes previously. Similarly, at follow-up the mothers of Oliver and Luke anecdotally reported the universal practice of high ratio of positive attention and praise was the most beneficial strategy they learnt. In particular, Luke's mother reported that she felt that this strategy had assisted her to establish a more positive relationship with Luke, and as a result, she perceived he was listening and complying more often. Although a small number of studies have anecdotally reported the assessment and implementation of universal home practices in PTR (Dunlap, Iovannone, Wilson, Kincaid, & Strain, 2010; Dunlap et al., 2015; Strain et al., 2015), there appears to be none which demonstrate the overall effectiveness of universal home practices on their own, that is, data to show their effectiveness or not. This current project is novel as it provides data demonstrating that the universal practices, on their own, were not effective and that a function based intervention plan was further required.

Effectiveness of PTR-F

To answer the second research question, the author measured targeted CB and DB during baseline, universal practices, intervention 1 and 2, and follow-up phases. The overall findings from all three children indicate that PTR-F is effective in decreasing persistent CB and teaching prosocial social-emotional competence. Parents also anecdotally shared improvements in behaviour such as when Finn's parents' took him to a family wedding they were worried that he would engage in tantrums but he did not and behaved perfectly. As such, the findings support previous PTR and PTR adapted studies which have demonstrated that PTR is effective in producing positive behaviour outcomes for young children in home and early childhood settings (Bailey & Blair, 2015; Dunlap et al., 2015; Dunlap, Iovannone,

Wilson, Kincaid & Strain, 2010; Dunlap, Strain, Lee, Joseph & Leech, 2017; Iovannone et al., 2009; Snell et al., 2014; Stanton-Chapman et al., 2016; Strain et al., 2011; Voorhees et al., 2013).

Moreover, follow-up data demonstrated that decreases in CB and increases in DB during PTR-F intervention were maintained for Luke, while Oliver's IBRST ratings indicated further decreases in CB from baseline levels and increases in DB. In contrast, Finn's CB and DB decreased from intervention levels, but remained above baseline levels. This could be explained by Finn having the opportunity to engage in more preferred activities (i.e. birthday parties) during follow-up. These results are in line with previous research, which indicate that behaviour outcomes are maintained once intervention discontinues (DeJager & Filter, 2015; Sears et al., 2013; Strain et al., 2011; Voorhees et al., 2013).

Interestingly, following implementation of PTR-F BIPs, overall parent ratings on the IBRST indicated an increase in DB for Oliver and Finn. The exception was Luke whose DB did not increase. This is in contrast to what we would expect. It is possible that the definition of Luke's DB did not truly reflect his parents' anecdotal reported improvements in DB. For example, although his DB ratings averaged 3 on the IBRST, his parents' anecdotally reported that Luke increasingly engaged in DB such as putting his plate on the bench before an instruction was given. They also reported that fewer instructions' were needed as Luke learnt independence skills, such as packing his own school bag. As previously discussed, one explanation is that the definition of DB did not truly reflect this behaviour.

This project added to PTR research by demonstrating that for some children, decreases in CB and increases DB may not be immediate. Indeed, Oliver's results indicate no change in targeted behaviour until day 26 of intervention. One explanation for this is Oliver's parents' low fidelity of implementation over this time (27% to 60%), with parents anecdotally reporting that the holiday period was a difficult time to implement strategies consistently and

accurately. This contrast with previous PTR-F studies which found immediate decreases in CB and increases in DB for all children. These results were associated with high implementation fidelity (Bailey & Blair, 2015; Sears et al., 2013). As such, it is possible that behaviour change is associated with the fidelity of implementation of intervention strategies.

In line with previous literature, this project also indicates that decreases in CB and increases in DB differ across children, indicating that PTR is more effective in producing behaviour change for some children than others (Bailey & Blair, 2015; DeJager & Filter, 2015; Dunlap, Iovannone, Wilson, Kincaid, & Strain, 2010; Dunlap et al, 2015; Sears et al., 2013; Strain et al., 2011; Voorhees et al., 2013).

Variability in child outcomes for targeted challenging and desirable behaviour.

Overall, this project demonstrated that a complete reduction in CB and increase in DB was not consistently observed. This finding supports previous PTR studies which have also shown variability in data over time (Bailey & Blair, 2015; DeJager & Filter, 2015; Dunlap, Iovannone, Wilson, Kincaid & Strain, 2010; Sears et al., 2013; Strain et al., 2011; Voorhees et al., 2013). A number of external factors contributed to the variability in child behaviour, such as; difficulty in identifying and recording behaviour, opportunities to engage in targeted CB and DB, extinction bursts, parent fidelity of implementation, family holidays, persistence of behaviour prior to intervention, and individual child characteristics. These factors are discussed below.

Difficulties identifying behaviour. Variability in Luke's DB data could be associated with his mother needing further training at days 9 and 31 to identify appropriate DB. This additional training was associated with an immediate increase in IBRST ratings (4 and 5 respectively). However, this was not maintained long-term, indicating additional factors were influencing DB (i.e. operational definition). Training was given in response to her report that

she was finding DB difficult to identify. At baseline Luke's parents' anecdotally reported that they perceived Luke did not engage in any positive behaviour and was not compliant (operationally defined as following an instruction within 10 seconds'). His mother anecdotally reported that CB was easier to identify as she was more aware of it which potentially influenced by his parents' acute awareness to CB. Additionally, CB was easily identified as it had a clear beginning (e.g. he ignores or resists instruction with absconding behaviour or changes the subject of conversation) and end (e.g. stopped engaging in this behaviour and complied with instructions). This is in line with Iovannone et al. (2014) findings who also found that teachers were more reliable observers of CB compared to DB. Of note, at post intervention Luke's parents' were identifying positive behaviour at greater rates than before the PTR-F process began.

Difficulties recording data. Although the parents were willing to complete IBRST forms and reported that they were easy to use, all parents reported to completing IBRST one or two days later on at least one occasion. Moreover, Oliver's mother missed two data points, while Luke's mother missed six data points throughout the programme due to family schedules, human error and a misunderstanding between the author and parent that data was still to be gathered. Similarly, Luke's CB during baseline and universal practice phases may not have been a true representation of frequency. His mother reported that some days his frequency of CB was above 30. She also expressed that she felt she was not accounting for all his targeted behaviours as she was not always present across the home. Although Luke's father was active in counting frequency, it is possible that data points were incidentally overlooked, counted twice or that was some variability between parents, but were still within the determined 1 to 5 IBRST scoring system. It is important to acknowledge that efforts were made to lessen these factors by collaboratively reviewing operational definitions, problem-solving and additional training periodically.

Opportunities to engage in targeted challenging and desirable behaviour. For all three children, the opportunities they had on any given day to engage in targeted CB and DB also contributed to variability in PTR-F outcomes. Luke and Oliver may have had limited opportunities for data recording on preschool days compared to non-preschool days. Moreover, Luke started school five days into follow-up (day 77). Similarly, activities during their time at home could also influence CB and DB. For example, on day 64 Luke participated in a baking activity with his mother, which was a new experience for him. This consisted of a high amount of opportunities for Luke to engage in DB. For Oliver and Finn, the type and/or location of activities could explain some variability in data. For example, Finn's spikes in CB (IBRST ratings of 4 and 5) across all phases were associated with activities he found highly desirable, such as swimming at the beach, birthday parties, bike rides to the park.

Extinction burst and parent fidelity of implementation. During intervention it was observed that all three children had an increase in CB. There are several possible explanations for this. One explanation is that the increase in CB was the result of an extinction burst. That is, in response to the elimination of reinforcement, children's CB increases. For example, Finn demonstrated increases in CB during intervention (e.g. days 45 to 49), compared to baseline. These increases in CB were often paired with parent reported inconsistency in addressing the function of behaviour, resulting in coercive cyclical parent-child interactions (Lerman & Iwata, 1995; Lerman, Iwata & Wallace, 1999, Patterson, Reid, & Dishion, 1992). For example, Luke parents provided verbal attention in response to his aggressive behaviour, which in turn resulted in an increase in aggressive behaviour. Similarly, Oliver's father anecdotally reported that he found tantrums difficult to ignore as he desired "peace and quiet" when home. Finn's parents' anecdotally reported that during days

45 to 49 they were more consistent with removing reinforcers which increased Finn's intensity, duration and frequency of CB. Lerman and Iwata's (1995) found that extinction bursts can occur in interventions when extinction strategies (i.e. planned ignoring) are implemented in combination with other strategies such as reinforcement of DB.

Family holidays. Another possible explanation for increases in CB was the holiday period. As previously mentioned, Oliver and Luke's CB escalated during the holiday period (Luke; days 36 to 42; Oliver: days 33 to 55). For Luke, he engaged in aggressive behaviour. It is important to highlight that according to Luke's parents', he had never engaged in aggressive behaviour until going on holiday (day 6 of intervention 1). It appears that for both children new unfamiliar environments/experiences, presence of additional family members/unfamiliar people, inconsistency of routine, Christmas time, and both parents reporting difficulty implementing strategies with high fidelity potentially contributed to their increases in CB.

To support intervention goals, both Luke and Oliver had amendments in their PTR-F BIPs (refer to Table 5) to address their escalation in CB. For both children, this was observed during the bedtime routine. This increase in CB for these two children suggests that intervention steps may not always be generalizable to all routines and contexts over time despite the function of behaviour remaining the same. However, family holiday and low parental implementation fidelity also affect child behavioural outcomes. It is possible that we need to programme for generalisation when planning function-based intervention plans, and then assess generalisation of treatment effects. This project builds on existing PTR literature as no previous PTR studies had reported problems in implementation, specifically the need to amend PTR-F intervention strategies. Nor had they reported issues with generalisation of behaviour change for children or those implementing interventions.

Persistence of behaviour prior to intervention. Another factor influencing the effectiveness of PTR-F BIPs in producing behaviour change is the strength and persistence of CB before intervention began. Romani et al. (2016) suggests that behaviour which has a long history of being reinforced becomes more persistent, more resistant to intervention and more likely to reappear over time. Additionally, as the three children's CB was more prevalent than DB pre-intervention, it was assumed that their CB behaviour was reinforced more frequently than DB prior to intervention.

Individual child characteristics All children had different targeted behaviour. Although Finn and Oliver's CBs were the same, how they engaged in this behaviour was different. For example, Finn threw objects, made verbal threats and hit and kicked others, while Oliver did not. These results are in line with previous PTR case studies which have shown variability in behaviour outcomes between children (Bailey & Blair, 2015; DeJager & Filter, 2015; Dunlap et al., 2015; Dunlap, Lee, Joseph, & Strain, 2010; Sears et al., 2015; Voorhees et al., 2013) and children who have the same target behaviours but engaged in CB differently (Stanton-Chapman et al., 2016; Strain et al., 2011).

Luke was the only child with stable CB during baseline and universal practices phases, while Finn and Oliver showed variability in CB. One contributing factor to Luke's stable persistent behaviour could be his developmental difficulties. As previously discussed, children with developmental difficulties have a higher prevalence of CB compared to typically developing children (Davies & Oliver, 2016; Hattier et al., 2011; Petty et al., 2014).

The effect of selected treatments on child behaviour outcomes. This project selected individual behaviour strategies (refer to Table 5) based on information collated from FBA, direct observations, evidence-based strategies for CB and teaching desirable replacement skills, and collaboration with parents. The strategies included, providing choices,

use of timers, social stories, and visual schedules. These strategies all had a positive effect in producing behaviour change for at least two of the three children, when used in conjunction with reinforcement of desirable behaviours. This latter strategy was also shown to produce positive behaviour change in other PTR-F studies, as well as the wider literature. (Bailey & Blair, 2015; Bui, Moore, & Anderson, 2013; DeJager & Filter, 2015; Dunlap et al., 2015; Dunlap, Iovannone, Wilson, Kincaid & Strain, 2010; Dunlap, Strain, Lee, Joseph & Leech, 2017; Gabor, Fritz, Roath, Rothe, & Gourley, 2016; Hansen & Wadsworth, 2015; Iovannone et al., 2009; Kern, Mantegna, Vorndran, Bailin, & Hilt, 2001; Kuoch, & Mirenda, 2003; Marshall, & Mirenda, 2002; Reichow, & Sabornie, 2009; Rispoli et al., 2013; Robertson, 2016; Schneider, 2010; Shogren, Faggella-Luby, Bae & Wehmeyer, 2004; Sears et al., 2013; Soenksen, & Alper, 2006; Strain et al., 2011; Voorhees et al., 2013).

It is important to highlight that due to the use of a combination of treatments, it is not possible to isolate which component of treatment was responsible for change and which were not effective in producing change. However, it was observed that some strategies were difficult for parents to implement for a number of reasons. One such strategy was the use of visual schedules to teach Luke to independently apply sunblock. His parent's discovered that his CB during this task was due to his dislike of sunscreen on his hands and face. However, by using a schedule to enhance predictability of this activity and inviting him to participate, Luke learnt to do particular steps independently (i.e. rubbing sunscreen in once his mother had applied it). In contrast, teaching Luke to pack his school bag using a visual schedule was unproblematic and resulted in a reduction in CB and increase in DB during his morning routine. Similarly, the removal of reinforcement for CB was a strategy that also proved problematic during this project. As previously discussed, this was associated with the parents' ability to remove the reinforcers in accordance with their function of behaviour. Parent's use of this strategy was influenced by their skill to use this strategy, parent perception of child

distress, appropriateness of context (i.e. home, pool, shopping mall), parent frustration, and overall ability to ignore the function of behaviour. As an example, after a problem solving discussion with Oliver's father, he could implement this strategy with high fidelity and CB decreased (day 68). Anecdotal reports by Finn and Oliver's family demonstrated that they identified that this strategy did decrease CB when they were implementing it consistently and when they were not implementing it consistently CB behaviour occurred more frequently and/or higher intensity. The author identified that all parents', at times, were resistant to change what they did. This finding supports Iovannone et al. (2009) suggestions that a focus of intervention is often changing the behaviour of the interventionist and they may have some resistance to change.

Fidelity. A surprising result of this project was that all parents were able to implement the universal and intervention strategies with high fidelity after one to three coaching sessions. This finding supports previous PTR studies, demonstrating that parents are capable of learning universal home practices and PTR-F intervention strategies, and have the ability to implement strategies with confidence and competence when given coaching and support (Bailey & Blair, 2015; Dunlap, Iovannone, Wilson, Kincaid & Strain, 2010; DeJager & Filter, 2015; Dunlap et al., 2015; Dunlap, Strain, Lee, Joseph & Leech, 2017; Iovannone et al., 2009; Sears et al., 2013; Strain et al., 2011). Importantly, during the universal practices phase, all parents' fidelity of implementation scores increased between the first and second observations, suggesting that these observations and feedback enhanced fidelity. However this was not always the case during intervention. This project found that parent's fidelity may decrease over time. For example, Luke's parents' and Finn's mother required additional coaching part-way through intervention. In particular, Luke's parents' decrease in fidelity scores were associated with a stressful family event and maternal physical and mental health stressors. In line with Bailey and Blair (2015) and Dunlap et al. (2015), and Sears et al.

(2013) this study provided further evidence that parent's may require additional coaching sessions to achieve above 80% fidelity. However it is important to note that at follow-up all parents maintained fidelity above 90% demonstrating that once the author discontinued support, all parents were able to implement strategies consistently and accurately. This finding provides further support for previous PTR research which demonstrated similar findings (Bailey & Blair, 2015; DeJager & Filter, 2015; Sears et al., 2013; Strain et al., 2011; Voorhees et al., 2013). Similarly this finding contrasted other studies demonstrating that once support from facilitators were withdrawn, teachers stop implementing PTR function-based intervention plans even though improvements in behaviour was evident (Iovannone et al., 2009; DeJager & Filter, 2015).

Practically, the collaborative nature of PTR-F required the author to be flexible with timelines in which fidelity checks/observations of child behaviour were completed. Observations were dependent on family circumstances and times convenient for families. This influenced the limited number of fidelity observations for all fathers, as they were often at work. Similarly, one fidelity observation was not completed for Luke's mother as she was out of town. Furthermore, family milieus influenced parent's implementation responsibilities. Although the mothers took on the primary interventionist role, in all families, the fathers took on the primary interventionist role during certain routines or periods of time such as when Oliver's father took over when his wife was busy with a younger child. This finding provides further support for previous PTR and other PBS research that have highlighted that designing intervention plans need to be practical and take into account family contexts (Duda et al., 2008; Kincaid, 2016; McLaughlin, 2012; Sears et al., 2013).

PTR-F procedural adherence. Procedural adherence results from the Self-Evaluation Checklists completed by the teams showed that all teams completed each of the steps in the PTR-F process with 100% adherence. This finding demonstrates that procedures

of PTR-F were followed successfully in each meeting, with families taking part in all aspects of PTR-F. This finding supports results demonstrated by Bailey and Blair (2015), Dunlap, Strain, Lee, Joseph & Leech (2017), and Sears et al. (2013) who also found that their families completed all of the steps of PTR as written.

Reliability. A novel aspect of this project was to ascertain if parents could record their data (on the IBRST) reliably. Results demonstrated that the mothers of both Oliver and Finn were able to record targeted behaviour using the IBRST with high accuracy. This findings further demonstrates the reliability (and usefulness) of the IBRST as a data gathering tool for home use. This finding further supports the work of Bailey and Blair (2015) and Iovannone et al. (2014), indicating that parents can be reliable data collectors.

Social validity. Providing further support for the effectiveness of PTR-F, all parents were highly satisfied with some aspects of PTR-F. However, it is important to note that there were aspects of PTR-F that some parents were not satisfied with. In particular, Luke's parents'; scored higher on 'disruption to the family', 'child discomfort', and lower on 'confidence in PTR-F effectiveness' 'permanent improvements', and 'time needed' compared to Oliver and Finn's parents'. One explanation for this difference could be that Luke's response to the intervention potentially contributed to his parents' ratings on these items. Additionally, Luke's family experienced external stressors (i.e. maternal pregnancy, maternal physical and mental health, extended family events, Luke starting school) which the other two families did not experience. Interestingly, Oliver's father perceived items of 'child discomfort', 'effectiveness in producing behaviour change' and 'permanent improvements' moderately (rating of 3) compared to his wife (rating of 1). This could be due to Oliver's father's difficulty in removing the reinforcers of Oliver's CB. That is, Oliver's father attributed his CB to Oliver being distressed, despite both parents anecdotally reporting Oliver

was not distressed at this time. Similarly, Luke's parents' rated the item 'willingness of other family members in assisting in the implementation of PTR-F intervention' lower than both parents of Oliver and Finn. Although no other family members were formally involved in the intervention, Luke's parents' anecdotally reported resistance from other family members' in supporting the PTR-F process. These results indicate that child responses to intervention, parent perceptions of behaviour and family context in which PTR-F occurred contributed to parent behaviour and perceptions of the intervention. Overall the social validity results from this project were consistent with previous research (DeJager & Filter, 2015; Dunlap et al., 2015; Dunlap, Strain, Lee, Joseph, & Leech, 2017; Iovannone et al., 2009; Sears et al., 2013). It is important to highlight that, Iovannone et al. (2009) indicated similar or higher results on the items 'disruptiveness of PTR', 'undesirable side effects' and 'child discomfort', 'time needed to carry out the process', 'confidence in PTR-F', and 'permanent improvements'. This project provides support for Iovannone et al. (2009) while contrasting other studies (DeJager & Filter, 2015; Dunlap et al., 2015; Dunlap, Strain, Lee, Joseph, & Leech, 2017) demonstrating that there is potential for problems in carrying out PTR. It is important to note that previous PTR-F studies do not report any results on items such as 'extent of child discomfort' and 'undesirable side effects' (Bailey & Blair, 2015; Sears et al., 2013).

PTR-F's applicability to the New Zealand setting

To answer the third question, the author examined overall child behaviour and social validity findings. Overall, the results provide preliminary support for the potential use of PTR-F in the New Zealand context, by demonstrating that all three children achieved their intervention goals and parents perceiving PTR-F as acceptable.

A noteworthy finding was that the collaborative nature of PTR-F influenced the usability of PTR-F for participating families. It was observed that Luke's parents' who had a

considerable understanding of evidence-based positive strategies were able to contribute more during intervention development, than parents without this prior knowledge. This supports findings by Bailey and Blair (2015) who found that families with varying experience and knowledge were able to contribute differently during the PTR process. This project observed that families needed significant support in understanding child behaviour, behaviour principles, FBA procedures, and evidence-based strategies and how to implement these. An interesting aspect observed by the author that may contribute to parent understanding of child behaviour was parent age. Although previous PTR research does not record ages of parents, the parents in this project were between 35-55 years in age. It was observed that parenting beliefs and behaviour expectations were at times associated with parent's age and stage of life.

Limitations

Like all projects, there were several limitations to this project. Firstly, while this project provided preliminary findings for PTR in the New Zealand context, it had a small sample size, with all families identifying as New Zealand European, and all child participants were male. This brings into question external validity. Future studies are needed with different participant samples to provide further support for PTRs applicability in the New Zealand context.

Secondly, participants were from three families in which individualised interventions were used. It is not possible to assume PTR-F BIP's and behaviour outcomes reported in this project would generalise to other children/families. Therefore conclusions should be interpreted with caution.

Third, the project encountered problems with parents using the IBRST measurement as parents had difficulty recording on holiday or remembering to do the recording each day. Starting a project outside of a major holiday would assist in overcoming this problem.

Fourth, child behaviour and fidelity observations were for short periods of time (60 minutes). It is possible that fidelity results do not reflect the true implementation fidelity of parents, as they may have implemented strategies well in the presence of the author, yet once the author left, fidelity may have decreased. All families reported that children behaved better in the presence of the researcher. This may have limited the opportunities for accurate observational data recording for the author to compare against parent IBRST data.

Lastly, due to time constraints the follow-up phase commenced straight after intervention. Additional follow-up probes taken over several months would have contributed to examining the long-term effectiveness of PTR-F with these three families.

Implications for Practice and Recommendations for Future Research

This project has highlighted findings and limitations that could lead to implications for practice and several recommendations for future research. The PTR-YC and PTR-F interventions recommend implementing universal home practices before individualised intervention commences; the current project demonstrated little change in CB and DB outcomes in participating children in the universal practices phase. Therefore, whether universal practices should be implemented before individualised interventions commence or can be implemented alongside PTR-F BIP's effectively needs further investigation.

As parents reported behaviour improvements in non-targeted CB during the universal practices phase, further research could incorporate an additional measure to assess behaviour improvements in CB overall throughout PTR-F.

Researchers, service providers and policy makers aim to support behaviour change using a minimal sufficiency model to intervention (Ting Wan Chu, Farruggia, Sanders & Ralph, 2012). Future research could incorporate additional coaching during the universal practice phase to ensure that the least intrusive intervention is used.

Although fidelity observations indicated parents could implement strategies adherently and consistently, anecdotal reports from parents indicated this was not always the case. Future research could look into possible strategies to increase implementation fidelity.

Understanding of child behaviour influenced parent's understanding of PTR-F processes such as FBA and developing relevant PTR-F BIPs. Future research could explore parents understanding of child behaviour and investigate the use of additional resources for typical interventions to support their understanding of child behaviour and PBS interventions.

Interventions were carried over a long period of time (i.e. three hours or whole day). It is recommended that when routines are identified with CB, strategies should be taught and implemented in one environment and then introduced to another environment.

Several factors contributing to implementation fidelity have been discussed. In line with recommendations found in Iovannone et al. (2009), future research could consider investigating parent attitudes of behaviour and its relationship with implementation fidelity. Furthermore, future research could consider incorporating a specific coaching component to orientate parents to general behaviour theories and possible challenges they may encounter during intervention.

Lastly, at follow-up parents anecdotally expressed their thoughts on the family implications of PTR-F however this project did not have the scope to investigate family quality of life. Future research could investigate the effect of PTR-F on family quality of life by including a semi-structured interview or additional questionnaire at follow-up.

Conclusions

This project is novel as this is the first time PTR-F has been investigated in the New Zealand context. Child behaviour results demonstrate that the universal practices phase was not effective in decreasing CB or teaching desirable prosocial social-emotional behaviour. Although it appears universal home practices provide a foundation for individualised multi-component intervention and this had a positive effect on the children's CB. However variables such as a long holiday period, the parents' ability to successfully identify and respond to desirable behaviour, opportunities to engage in desirable targeted behaviour, persistence of CB, parent fidelity to strategies and resistance to change influenced positive behaviour outcomes for all three children. Social validity results indicate that parents were willing to implement intervention strategies and that with support they were able to act as the primary interventionist, implementing strategies consistently and adherently over time. Yet, fidelity to strategies was variable, demonstrating additional coaching support was required. Overall findings suggest that the PTR-F programme is applicable to the New Zealand context. Specifically, the PTR-F procedures were perceived by parents as acceptable, likeable, fitted into daily routines of the three participating families, and increased their child's desirable behaviour and decreased their challenging behaviour. The findings are promising with future research to further investigate PTR-F's effectiveness and adaptability to the New Zealand context.

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Appendices

Appendix A: Ethics Approval



HUMAN ETHICS COMMITTEE

Secretary, Rebecca Robinson
 Telephone: +64 03 369 4588, Extn 94588
 Email: human-ethics@canterbury.ac.nz

Ref: 2017/21/ERHEC

1 June 2017

Helen Shadbolt
 School of Health Sciences
 UNIVERSITY OF CANTERBURY

Dear Helen

Thank you for providing the revised documents in support of your application to the Educational Research Human Ethics Committee. I am very pleased to inform you that your research proposal "The Effects of the Prevent-Teach-Reinforce Model for Young Children: an Early Childhood Centre and Home Approach" has been granted ethical approval.

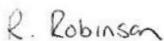
Please note that this approval is subject to the incorporation of the amendments you have provided in your email of 24th May 2017.

Should circumstances relevant to this current application change you are required to reapply for ethical approval.

If you have any questions regarding this approval, please let me know.

We wish you well for your research.

Yours sincerely

PP 

Dr Patrick Shepherd
Chair
Educational Research Human Ethics Committee

Please note that ethical approval relates only to the ethical elements of the relationship between the researcher, research participants and other stakeholders. The granting of approval by the Educational Research Human Ethics Committee should not be interpreted as comment on the methodology, legality, value or any other matters relating to this research.

F E S

Appendix B: Amended Ethics Approval



HUMAN ETHICS COMMITTEE

Secretary, Rebecca Robinson
 Telephone: +64 03 369 4588, Extn 94588
 Email: human-ethics@canterbury.ac.nz

Ref: 2017/21/ERHEC Amendment 1

9 November 2017

Helen Shadbolt
 School of Health Sciences
 UNIVERSITY OF CANTERBURY

Dear Helen

Thank you for your request for an amendment to your research proposal “The Effects of the Prevent-Teach-Reinforce Model for Young Children: an Early Childhood Centre and Home Approach” as outlined in your email dated 9th November 2017. I am pleased to advise that this amendment has been considered and approved by the Educational Research Human Ethics Committee.

Please note that should circumstances relevant to this current application change you are required to reapply for ethical approval.

If you have any questions regarding this approval, please advise.

We wish you well for your continuing research.

Yours sincerely

PP *R. Robinson*

Dr Patrick Shepherd
Chair
Educational Research Human Ethics Committee

Please note that ethical approval relates only to the ethical elements of the relationship between the researcher, research participants and other stakeholders. The granting of approval by the Educational Research Human Ethics Committee should not be interpreted as comment on the methodology, legality, value or any other matters relating to this research.

F E S

Appendix C: Parent/Caregiver Information Sheet

College of Education, Health and Human Development

Telephone:

Email:



The Effects of the Prevent-Teach-Reinforce (PTR) Model for young children: An early childhood centre and home approach.

Parent/Caregiver Information Sheet

To Parents/Caregivers,

My name is Helen Shadbolt and I am undertaking a thesis project for my Masters of Arts (in Child and Family Psychology) at the University of Canterbury. The aim of my project is to examine the effects of the Prevent-Teach-Reinforce programme on challenging behaviour of 3-5 year old children in an early childhood, and home setting. The second aim is to examine the adaptability of the Prevent-Teach-Reinforce programme to the New Zealand cultural context. This letter is to request your participation in my research project, and outline the nature of the research I am conducting.

The Prevent-Teach-Reinforce programme is designed to help a young child whose behaviours interfere with their ability to engage in positive relationships, form friendships, play with others, and learn expected skills. The programme uses positive teaching strategies to reduce challenging behaviours, and teach desirable behaviours. Parents/caregivers will collaborate with the researcher to plan and implement a behaviour support plan. The researcher provides coaching and support to carry out the behaviour support plan in the home. A similar programme will be conducted in your child's classroom with their teachers.

The study has two parts, with my guidance: 1) In the centre, form a team in your child's classroom, to plan and implement the Prevent- Teach- Reinforce programme, and 2) with the parents/caregivers, plan and implement the Prevent- Teach- Reinforce programme in your home.

If you choose to take part in this study, your involvement will be for a period of 2-3 months, in which you will;

- Work in collaboration with the researcher to plan and implement a Prevent-Teach-Reinforce programme in your home.
- Participate in at least four meetings, up to 30-90 minutes in length, in your home at a time that is suitable for you.
- Over the course of the Prevent-Teach-Reinforce programme and with the researcher, complete 17 Prevent-Teach-Reinforce forms. These forms take about 10 minutes each to complete.
- Attend a coaching session with the researcher, to learn how to implement the Prevent- Teach-Reinforce strategies. The time of the coaching session will be negotiated with you and will take up to 90 minutes.

Participation is voluntary and you have the right to withdraw from the project at any time without penalty. If you choose to withdraw, I will use my best endeavours to remove any of the information

relating to you from the project including any final publication provided that this remains practically achievable.

There are a small number of risks in taking part in this study and these are mitigated in the following ways. Because the PTR programme is also being implemented in your child's centre as well, there is a small chance some other children and/or parents may identify your child as the child of focus. The teachers will say that the strategies they are using are for all children, and they are teaching all children to focus on their (name the behaviours).

To maintain your confidentiality the researcher will not share your 'home' information with the centre managers or teachers. You will have the option to join the centre team, if you wish. You may request the centre team information from the centre manager. The centre will share information with you, as per their policy and procedures.

A thesis is a public document and will be available through the UC Library. The results of the project may be published in a journal, and/or presented at a conference, but you may be assured of the complete confidentiality of data gathered in this investigation: your identity will not be made public without your consent. To ensure anonymity and confidentiality, all information will be kept confidential to the researcher and my supervisors. All data will be kept in a locked filing cabinet, in the office of the researcher at the University of Canterbury during the project. Once the project is completed, all relevant information including data, will be digitised and kept in a password protected folder with my senior supervisor. All information will be destroyed after 5 years.

Please indicate to the researcher on the consent form if you would like a copy of the summary of results of the project.

The project is being carried out by Helen Shadbolt under the supervision of Dr Laurie McLay, who can be contacted at. She will be pleased to discuss any questions you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Educational Research Human Ethics Committee, and participants should address any complaints to).

If you agree for you and your child to participate in the study, you are asked to complete the consent form and return to the centre or via email to Helen Shadbolt. Email: [_](#) or I can come and pick it up from your home.

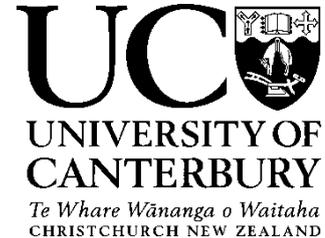
Helen Shadbolt
(Researcher)

Appendix D: Child Information Sheet

College of Education, Health and Human Development

Telephone:

Email:



The Effects of the Prevent-Teach-Reinforce (PTR) Model for young children: An early childhood centre and home approach.

Child Information Sheet

The following information will be read with the child.

Helen is doing some work for her school, and she needs our help. She is going to talk with you, us, and your teachers about the things you enjoy doing, and the things you don't like doing. She is going to help mum/dad/caregiver, and your teachers learn new things, so you can enjoy preschool more, and help us with (name problem area). She is going to come and visit you at home, and preschool, to watch us play.

If you don't want to do anything, or say something you can say, "I don't want to." If you don't want Helen helping us, and your teachers you can say, "Stop." If Helen thinks that you are upset she will stop, and tell us.

When Helen has finished helping us, and your teachers, she is going to write a story for other people to read. So people don't know who you are, Helen will give you a code name.

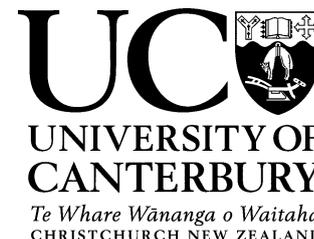
Helen has a teacher named Laurie. Laurie might come and visit us at home or preschool too.

Appendix E: Parent/Caregiver Consent Form

College of Education, Health and Human Development

Telephone:

Email:



The Effects of the Prevent-Teach-Reinforce (PTR) Model for young children: An early childhood centre and home approach.

Consent Form for Parents/Caregivers

- I have been given a full explanation of this project, and have had the opportunity to ask questions.
- I understand that the Prevent-Teach-Reinforce programme will be implemented at the centre, as well as in my home if I agree to take part in the research.
- I understand what is required of me if I agree to take part in the research.
- I understand that participation is voluntary, and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.
- I understand that any information or opinions I provide will be kept confidential to the researcher, and supervisors, and that any published or reported results will not identify the participants or early childhood centre. I understand that a thesis is a public document, and will be available through the UC Library, and the results may be presented at conferences or published in a journal.
- I understand that all data collected for the study will be kept in locked and secure facilities, and/or in password protected electronic form, and will be destroyed after five years.
- I understand the risk associated with taking part, and how they will be managed.
- I understand that I am able to receive a report on the findings of the study by contacting the researcher at the conclusion of the project.
- I understand that I can contact the researcher, and senior supervisor for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Educational Research Human Ethics Committee).
- I would like a summary of the results of the project.
- By signing below, I agree to participate in this research project.

Name: _____ Signed: _____ Date: _____

Email Address: _____

Names: _____ Signed: _____ Date _____

Email Address: _____

Please return this consent form to the centre manager, via email: or I can come and pick it up from your home.

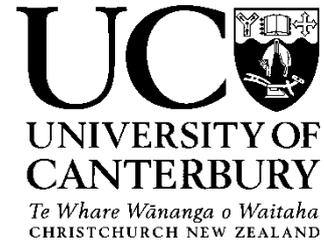
Helen Shadbolt (Researcher)

Appendix F: Child Assent Form

College of Education, Health and Human Development

Telephone:

Email:



The Effects of the Prevent-Teach-Reinforce Model for young children: An early childhood centre and home approach.

Child Assent Form

The following information will be read by the parent/caregiver, with the child:

1. Helen has talked with me, and asked if she can work with us, and your teachers, to help us at home, and preschool, so you can enjoy preschool more, and to help us with (name problem area).
2. I understand that I do not have to do, or say anything I don't want to.
3. If I change my mind at any stage I can stop.
4. If Helen thinks that I am upset she will stop, and tell me parents.
5. I agree to help Helen with her project.

Child to Sign

Primary Researcher to Sign

Parent/Caregiver to Sign

Appendix G: Family Demographics

Family Demographics (to be completed by the parents/caregivers)

1. How many adults in your family? _____
2. How old are they? **Please circle ages of adults:**

18 -19 20-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59
 60-64 65-69 70-74 75- 79 89-84 85-89 90-94 95-99 100-105

3. How many children are in your family? _____
4. How old are they? **Please circle ages of children:**

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

5. Do you have a significant other? Yes No
6. What ethnicity is your family? **Please circle ethnicity:**

Maori	Pacific Island	New Zealand European	Asian	European
Middle Eastern	African	Latin American	Other (please specify)	_____

7. Have you sought assistance for your child's challenging behaviour previously? Yes No
 If so, who with?

If so, for what?

8. Tell me about what worked?

9. What didn't work? Why?

10. How long has the challenging behaviour been occurring?

11. What strategies have you used in the past?

12. Which ones have been effective?

13. Which ones haven't been effective? Why?

14. How long has your child been attending the centre?

15. Has your child any close friends? Yes No

16. What does s/he like doing?

Appendix H: PTR-F Behaviour Rating Scale (Individualised Behaviour Rating Scale Tool)



PTR-F Behavior Rating Scale

Child: _____ Rater: _____ Routine: _____ Mont _____ Date/time: _____

Desirable behavior	<input type="checkbox"/> 5																				
	<input type="checkbox"/> 4																				
	<input type="checkbox"/> 3																				
	<input type="checkbox"/> 2																				
	<input type="checkbox"/> 1																				
Challenging behavior	<input type="checkbox"/> 5																				
	<input type="checkbox"/> 4																				
	<input type="checkbox"/> 3																				
	<input type="checkbox"/> 2																				
	<input type="checkbox"/> 1																				

Desirable behavior: _____ Challenging behavior: _____

5 = _____ 5 = _____
 4 = _____ 4 = _____
 3 = _____ 3 = _____
 2 = _____ 2 = _____
 1 = _____ 1 = _____

Prevent-Teach-Reinforce for Families: A Model of Individualized Positive Behavior Support for Home and Community by Glen Dunlap, Phillip S. Strain, Janice K. Lee, Jaclyn D. Joseph, Christopher Vatland, and Lise Fox. Copyright © 2017 Paul H. Brookes Publishing Co., Inc. All rights reserved.

Appendix I: Self-Evaluation Checklist: Initiating the PTR-F Process



Self-Evaluation Checklist: Initiating the PTR-F Process

		YE	NO
1.	Have the family and facilitator established good communication and agreed to adopt the PTR-F model?	<input type="checkbox"/>	<input type="checkbox"/>
2.	Have the family and facilitator agreed on additional team members and invited them to participate?	<input type="checkbox"/>	<input type="checkbox"/>
3.	Have long-term goals been discussed as a vision for the child and family?	<input type="checkbox"/>	<input type="checkbox"/>
4.	Have short-term goals for challenging behaviors and desirable behaviors been listed on the PTR-F Goal Sheet?	<input type="checkbox"/>	<input type="checkbox"/>
5.	Has a specific challenging behavior been identified as a target, and has it been operationally defined?	<input type="checkbox"/>	<input type="checkbox"/>
6.	Have anchors for challenging behavior on the Behavior Rating Scale (BRS) been carefully specified so that data collection will be reliable and sensitive to behavior change?	<input type="checkbox"/>	<input type="checkbox"/>
7.	Have the procedures of BRS data collection (e.g., who, when) and data summary been agreed upon?	<input type="checkbox"/>	<input type="checkbox"/>
8.	Have the data collection procedures been implemented so that all are comfortable with their roles and how data will be shared?	<input type="checkbox"/>	<input type="checkbox"/>

Appendix J: Self-Evaluation Checklist: PTR-F Assessment



Self-Evaluation Checklist: PTR-F Assessment

		Yes	No
1.	Did the team complete the three PTR-F assessment checklists (i.e., Prevent, Teach, Reinforce)?	<input type="checkbox"/>	<input type="checkbox"/>
2.	Were the completed checklists reviewed by the team and summarized on the PTR-F Assessment Summary Table?	<input type="checkbox"/>	<input type="checkbox"/>
3.	Were hypotheses developed to summarize the team's understanding of the function of the child's challenging behavior and the ways that the behavior is influenced by the environment?	<input type="checkbox"/>	<input type="checkbox"/>
4.	Has a specific desirable behavior been identified as a target, and has it been operationally defined on the PTR-F Goal Sheet?	<input type="checkbox"/>	<input type="checkbox"/>
5.	Have anchors for desirable behavior on the Behavior Rating Scale been carefully specified so that data collection will be reliable and sensitive to behavior change?	<input type="checkbox"/>	<input type="checkbox"/>

Appendix K: Self-Evaluation Checklist: PTR-F Intervention



Self-Evaluation Checklist: PTR-F Intervention

		Yes	No
1.	Has the team carefully assessed the status of general parenting strategies, and have steps been taken to improve the implementation of these strategies?	<input type="checkbox"/>	<input type="checkbox"/>
2.	Did the team members review the descriptions of the required intervention strategies for reinforce and the possible intervention strategies for prevent and teach (listed in the PTR-F Intervention Menu)?	<input type="checkbox"/>	<input type="checkbox"/>
3.	Did the team decide on intervention strategies to include in the child's behavior support plan?	<input type="checkbox"/>	<input type="checkbox"/>
4.	Did the team complete the PTR-F Behavior Support Plan Summary?	<input type="checkbox"/>	<input type="checkbox"/>
5.	Did the team determine next steps for implementing the behavior support plan and the schedule for training and support?	<input type="checkbox"/>	<input type="checkbox"/>

Appendix L: Universal Practices Fidelity of Strategy Implementation Form

Universal Practices Fidelity of Strategy Implementation Form

Child: _____ Routine _____ Date: _____ Person implementing: _____

Strategy steps	Were the steps implemented as intended?	Did your child respond as intended?	Was the strategy implemented as frequently as intended?
5:1 Positive Praise: 1. Identifying positive behaviour 2. Verbal praise given 3. Paired with positive reinforcement i.e. high five, tickles	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Maintain Predictable Routine : 1. Regular daily routine 2. Consistent pattern of routines 3. Predictable 4. Daily Maintained	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Behaviour Expectations: 1. Clearly defined 2. Differentiated between desired and undesired behavior 3. Applying behavior expectations	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Appendix M: PTR-F Fidelity of Strategy Implementation Form



PTR-F Fidelity of Strategy Implementation Form

Child: _____ Routine: _____

Date: _____ Person implementing: _____

Strategy steps	Were the steps implemented as intended?	Did your child respond as intended?	Was the strategy implemented as frequently as intended?
Prevent strategy: 1. 2. 3. 4. 5.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No 	<input type="checkbox"/> Yes <input type="checkbox"/> No
Teach strategy: 1. 2. 3. 4. 5.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No 	<input type="checkbox"/> Yes <input type="checkbox"/> No
Reinforce strategy: 1. 2. 3. 4.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No 	<input type="checkbox"/> Yes <input type="checkbox"/> No

Appendix N: PTR-F Goal Sheet



PTR-F Goal Sheet

Instructions:

1. Identify and write out the child's challenging behaviors to decrease and the contexts or routines where these behaviors need to improve.
2. Select ONE challenging behavior to target within family contexts or routines.
3. Operationally define this target behavior—observable (seen or heard) and measurable (counted or timed).
4. Identify and write out the child's desirable behaviors to increase.
5. Select target desirable behavior (to be completed following PTR-F assessment).
6. Operationally define the desirable behavior (to be completed following PTR-F assessment).

Child: _____

Date: _____

Goals: Challenging behaviors		
	<i>Behaviors</i>	<i>Context/routines</i>
Challenging behaviors to decrease		
Target behavior		
Operational definition		
Goals: Desirable behaviors		
Desirable behaviors to increase		
Target behavior	(to be completed following PTR-F assessment)	

Operational definition	(to be completed following PTR-F assessment)
------------------------	----------------------------------------------

Prevent-Teach-Reinforce for Families: A Model of Individualized Positive Behavior Support for Home and Community by Glen Dunlap, Phillip S. Strain, Janice K. Lee, Jaclyn D. Joseph, Christopher Vatland, and Lise Fox.
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Appendix O: PTR-F Assessment Checklist: Prevent



PTR-F Assessment Checklist: Prevent

Challenging behavior: _____ Person responding: _____ Child: _____

1. Are there times of the day when challenging behavior is most likely to occur? If yes, what are they?				
___ Waking up ___ Morning	___ Before meals ___ Afternoon	___ During meals ___ Nap time	___ After meals ___ Evening	___ Preparing meals ___ Bedtime
Other: _____				
2. Are there specific activities when challenging behavior is very likely to occur? If yes, what are they?				
___ Leaving home ___ Arriving home ___ Family celebrations ___ Church/religious activities ___ Looking at books ___ Watching television/ device ___ Special event (specify): _____	___ Nap time ___ Toileting/diapering ___ Bathing ___ Toothbrushing ___ Play group/classes ___ Eating out ___ Visiting others ___ Snack	___ Interactions with sibling/child ___ Indoor play ___ Outdoor play ___ Meals ___ In the car/bus ___ At a store ___ Park/playground	___ Taking medicine ___ Medical procedure ___ At doctor or therapist ___ At dentist ___ Children's attractions (e.g., zoo) ___ Transitions (specify): _____	
Other: _____				
3. Are there other children or adults whose proximity is associated with a high likelihood of challenging behavior? If so, who are they?				
___ Siblings ___ Family member(s) ___ Care provider(s) ___ Other adults	Specify: _____ Specify: _____ Specify: _____ Specify: _____	___ Parent ___ Other children (specify): _____		
Other: _____				

4. Are there times of the day when challenging behavior is least likely to occur? If yes, what are they?

<input type="checkbox"/> Waking up <input type="checkbox"/> Morning	<input type="checkbox"/> Before meals <input type="checkbox"/> Afternoon	<input type="checkbox"/> During meals <input type="checkbox"/> Nap time	<input type="checkbox"/> After meals <input type="checkbox"/> Evening	<input type="checkbox"/> Preparing meals <input type="checkbox"/> Bedtime
------------------------------------------------------------------------	-----------------------------------------------------------------------------	----------------------------------------------------------------------------	--------------------------------------------------------------------------	------------------------------------------------------------------------------

Other: _____

5. Are there specific activities when challenging behavior is least likely to occur? What are they?

<input type="checkbox"/> Leaving home <input type="checkbox"/> Arriving home <input type="checkbox"/> Family celebrations <input type="checkbox"/> Church/religious activities <input type="checkbox"/> Looking at books <input type="checkbox"/> Watching television/device <input type="checkbox"/> Special event (specify): _____	<input type="checkbox"/> Nap time <input type="checkbox"/> Toileting/diapering <input type="checkbox"/> Bathing <input type="checkbox"/> Toothbrushing <input type="checkbox"/> Play group/classes <input type="checkbox"/> Eating out <input type="checkbox"/> Visiting others <input type="checkbox"/> Snack	<input type="checkbox"/> Interactions with sibling/child <input type="checkbox"/> Indoor play <input type="checkbox"/> Outdoor play <input type="checkbox"/> Meals <input type="checkbox"/> In the car/bus At a store <input type="checkbox"/> Park/playground	<input type="checkbox"/> Taking medicine <input type="checkbox"/> Medical procedure <input type="checkbox"/> At doctor or therapist <input type="checkbox"/> At dentist <input type="checkbox"/> Children's attractions (e.g., zoo) <input type="checkbox"/> Transitions (specify): _____
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Other: _____

Additional comments not addressed:

Appendix P: PTR-F Assessment Checklist: Teach



PTR-F Assessment Checklist: Teach

Challenging behavior: _____ Person responding: _____ Child: _____

1. What communication skill(s) (using words, pictures, signs, augmentative systems) could the child learn in order to reduce the likelihood of the challenging behavior occurring in the future?		
<input type="checkbox"/> Asking for a break <input type="checkbox"/> Asking for help <input type="checkbox"/> Requesting wants and needs	<input type="checkbox"/> Expressing emotions (e.g., frustration, anger, hurt) <input type="checkbox"/> Expressing aversions (e.g., “No,” “Stop”)	<input type="checkbox"/> Expressing preference when given a choice (e.g., “Yes, I like that,” “I want the_one.”)
Other: _____		
2. What social skill(s) could the child learn in order to reduce the likelihood of the challenging behavior occurring in the future?		
<input type="checkbox"/> Getting attention appropriately <input type="checkbox"/> Sharing—giving a toy <input type="checkbox"/> Sharing—asking for a toy <input type="checkbox"/> Taking turns <input type="checkbox"/> Beginning interactions with peers and adults	<input type="checkbox"/> Staying on topic with peers and adults in a back-and-forth exchange <input type="checkbox"/> Offering a play idea (“You be the mommy”) <input type="checkbox"/> Playing appropriately with toys and materials with peers	<input type="checkbox"/> Accepting positive comments and praise <input type="checkbox"/> Making positive comments <input type="checkbox"/> Giving praise to peers <input type="checkbox"/> Waiting for acknowledgment or reinforcement <input type="checkbox"/> Skills to develop friendships
Other: _____		
3. What problem-solving skill(s) could the child learn in order to reduce the likelihood of the challenging behavior occurring in the future?		
<input type="checkbox"/> Controlling anger <input type="checkbox"/> Controlling impulsive behavior <input type="checkbox"/> Strategies for calming down <input type="checkbox"/> Asking for help <input type="checkbox"/> Using visuals to support independent play	<input type="checkbox"/> Self-management <input type="checkbox"/> Playing independently <input type="checkbox"/> Playing cooperatively <input type="checkbox"/> Following directions <input type="checkbox"/> Following schedules and routines <input type="checkbox"/> Accepting “no” <input type="checkbox"/> Managing emotions	<input type="checkbox"/> Getting engaged in an activity <input type="checkbox"/> Staying engaged in activities <input type="checkbox"/> Choosing appropriate solutions <input type="checkbox"/> Making choices from appropriate options <input type="checkbox"/> Following through with choices
Other: _____		
Additional comments not addressed:		

Appendix Q: PTR-F Assessment Checklist: Reinforce



PTR-F Assessment Checklist: Reinforce

Challenging behavior: _____ Person responding: _____ Child: _____

1. What consequence(s) usually follow your child's challenging behavior?			
<input type="checkbox"/> Sent to time out <input type="checkbox"/> Sent to bedroom <input type="checkbox"/> Sent to quiet spot/corner <input type="checkbox"/> Given personal space <input type="checkbox"/> Delay in activity <input type="checkbox"/> Activity changed <input type="checkbox"/> Activity ended <input type="checkbox"/> Removed from activity	<input type="checkbox"/> Calming/soothing <input type="checkbox"/> Talk about what just happened <input type="checkbox"/> Spanking <input type="checkbox"/> Assistance given <input type="checkbox"/> Verbal warning <input type="checkbox"/> Verbal redirect <input type="checkbox"/> Verbal reprimand/scolding <input type="checkbox"/> Review house rules <input type="checkbox"/> Physical guidance <input type="checkbox"/> Sibling/peer reaction	<input type="checkbox"/> Gets desired item/toy/food <input type="checkbox"/> Gets access to desired activity Other: _____	
2. What is the likelihood that privileges or preferred items/activities are removed from your child following your child's challenging behavior?			
_____ Very likely	_____ Sometimes	_____ Seldom	_____ Never
3. What is the likelihood of your child's challenging behavior resulting in acknowledgment (e.g., reprimands, corrections, restating house rules) from adults and children?			
_____ Very likely	_____ Sometimes	_____ Seldom	_____ Never
4. Does the challenging behavior seem to occur in order to gain attention from other children (e.g., siblings, peers)?			
<input type="checkbox"/> Yes <i>List specific children</i> _____ <input type="checkbox"/> No			
5. Does the challenging behavior seem to occur in order to gain attention from adults?			
<input type="checkbox"/> Yes <i>List specific adults</i> _____ <input type="checkbox"/> No			
6. Does the challenging behavior seem to occur in order to obtain objects (e.g., toys, games, materials, food) from other children or adults?			
<input type="checkbox"/> Yes <i>List specific objects</i> _____ <input type="checkbox"/> No			
7. Does the challenging behavior seem to occur in order to delay a transition from a preferred activity to a nonpreferred activity?			
<input type="checkbox"/> Yes <i>List specific transitions</i> _____ <input type="checkbox"/> No			

FORM 6 PTR-F Assessment Checklist: Reinforce (continued)

8. Does the challenging behavior seem to occur in order to terminate or delay a nonpreferred (e.g., difficult, boring, repetitive) task or activity?			
<input type="checkbox"/> Yes <i>List specific tasks or activities</i> _____ <input type="checkbox"/> No			
9. Does the challenging behavior seem to occur in order to get away from a nonpreferred child or adult?			
<input type="checkbox"/> Yes <i>List specific children or adults</i> _____ <input type="checkbox"/> No			
10. What is the likelihood of your child's appropriate behavior (e.g., participating appropriately, cooperating, following directions) resulting in acknowledgment or praise from adults or children?			
_____ Very likely	_____ Sometimes	_____ Seldom	_____ Never
11. Does your child enjoy praise from adults and children? Does your child enjoy praise from some people more than others?			
<input type="checkbox"/> Yes <i>List specific people</i> _____ <input type="checkbox"/> No			
12. What items and activities are most enjoyable to the child? What items or activities could serve as special rewards?			
<input type="checkbox"/> Social interaction with adults <input type="checkbox"/> Physical interaction with adults (rough-housing, tickle, cuddle) <input type="checkbox"/> Social interaction with siblings/ peers <input type="checkbox"/> Playing a game <input type="checkbox"/> Parent helper <input type="checkbox"/> Extra time outside <input type="checkbox"/> Extra praise and attention from adults <input type="checkbox"/> Extra time in preferred activity	<input type="checkbox"/> High fives <input type="checkbox"/> Praise from adults <input type="checkbox"/> Praise from siblings/ other kids <input type="checkbox"/> Music <input type="checkbox"/> Puzzles <input type="checkbox"/> Books <input type="checkbox"/> Special activity <input type="checkbox"/> Special helper <input type="checkbox"/> Computer time <input type="checkbox"/> Television time	<input type="checkbox"/> Small toys, prizes (e.g., stickers, stamps) <input type="checkbox"/> Device time (e.g., tablet, electronic game system) <input type="checkbox"/> Art activities (e.g., drawing pictures, painting) <input type="checkbox"/> Objects/toys: (specify) _____ <input type="checkbox"/> Food: (specify) _____	
Other: _____			
Additional comments not addressed:			

Appendix R: Home Profile of Challenging Behaviour

Home Profile of Challenging Behaviour

- | | | | |
|----|-----------------------------------------------------------------------------------------------------------------------------|-----|----|
| 1 | Does challenging behaviour occur across most or all home routines? | Yes | No |
| 2 | Are there other siblings who are engaging in persistent challenging behaviour? | Yes | No |
| 3. | Have you reduced the time allocated to family or community activities because of challenging behaviour? | Yes | No |
| 4. | Have you eliminated any routine activities because of challenging behaviour? | Yes | No |
| 5. | Is your child or children often removed from an activity because of their challenging behaviour? | Yes | No |
| 6. | Are the challenging behaviours of your child being imitated by siblings or peers? | Yes | No |
| 7. | Have challenging behaviours gotten worse over the course of 6 months? | Yes | No |
| 8. | Is your child currently receiving or has received assistance with their challenging behaviour? If yes, when, and with whom? | Yes | No |

Appendix S: Home Practices Assessment

Home Practices Assessment

1. Where are you giving your time and attention? It is easy to fall into a pattern of giving time and attention to challenging behaviour and to largely ignore children who have persistent challenging behaviour when they are behaving appropriately. It is critical to be spending the vast majority of time with your child when he or she is behaving well. Ask yourselves this question:
 - Are we providing positive feedback to our child with persistent challenging behaviour at five times or more the rate that we are giving corrective feedback for challenging behaviour? Yes No
2. Where are you at in providing your children with a level of predictability in the daily routine that prevents challenging behaviour? Most homes have a daily routine. However, some homes do not have the level of predictability to the routine that provides children with the certainty necessary to act as a prevention to challenging behaviour. Routines that become interrupted or altered by challenging behaviour, different adults in the home or community, or a whim to do something different are not prevention routines. Likewise, routines that are not taught directly to children, reviewed with children on a regular basis, or discussed beforehand with children when a necessary change needs to be made (e.g. going to a different supermarket) are not prevention routines. Ask yourself this question:
 - Are we using routines in a way that is likely to prevent challenging behaviour? Yes No
3. Looking more deeply into the question of routines, are there predictable routines within routines within routines as a planned part of your home? For example, bed time is a routine that occurs every day. Simply having that general routine as a predictable event, however will not function to prevent challenging behaviour. There must be a consistent routine within bedtime. For example, in Chris' family, brushing his teeth is the first step in his bedtime routine every day, and the first step within brushing his teeth is to put toothpaste on his toothbrush. Simply having this step within your routine, however, is not sufficient for many children with challenging behaviour. They need yet another level of predictability. Chris's family has a routine within his brushing teeth routine such that every day the sequence of events is for Chris to open the tooth paste lid, he puts toothpaste on his brush and then he puts the toothpaste back in the draw. Ask yourself this question:
 - Do we have routines within routines within routines across the day? Yes No
4. Are we explicitly teaching the behavioural expectations for each routine? Many families have house rules for behaviour, such as, use walking feel, share toys and materials, use inside voice, keep toys and friends safe. Having these rules is worthwhile, but, in many cases, they simply are a poster on the fridge. Families may make the mistake of assuming that their children know how to behave appropriately and that their challenging behaviour is simply noncompliance. Sometimes this is the case, but the only way to be certain is to have explicitly taught the specific expectations in the first place. Ask yourself this question:
 - Have we taught our children the specific behaviours we want to see for each home routine? Yes No

Appendix T: PTR-F Assessment Summary Table



PTR-F Assessment Summary Table

Child: _____ Date: _____

Challenging behavior:	
1. PREVENT	2. REINFORCE
3. Hypothesis statement: When _____	
Desirable behavior:	
4. PREVENT	5. REINFORCE
6. TEACH	

Appendix U: PTR-F Behaviour Support Plan Summary



PTR-F Behaviour Support Plan Summary

Child: _____ Date: _____

Practices for all children:

- Provide high rates of positive attention.
- Establish and maintain predictable daily schedules.
- Include consistent patterns of activities within daily routines.
- Define behavioral expectations and difference between desirable and challenging behaviour.

Hypothesis statement:

Intervention strategies:

Prevent

Teach

Reinforce

	Prevent	Teach	Reinforce
Strategies			All plans must: 1. Identify valued, functional 186inforce(s) 2. Provide 186inforce for desirable behavior 3. Remove reinforcement for challenging behavior
Brief description			
Implementation notes			

Appendix V: PTR-F Coach Planning and Reflection Log



PTR-F Coach Planning and Reflection Log

Family name: _____ Coaching session date: _____

Target routine	Time of routine	Family member to coach

A. Progress review (notes from your discussion with family):

B. Review of intervention plan (notes from your discussion with the family):

C. Observation of routine:

In addition to completing the PTR-F Fidelity of Strategy Implementation Form, record your reflections from the observation

What I observed	What I want to share

D. Reflection/feedback (notes from your discussion):

FORM 13 PTR-F Coach Planning and Reflection Log *(continued)*

Coaching strategies

The form below allows the facilitator to indicate whether a particular strategy was used during observation (with parent consent), during plan review, or during reflection and feedback.

Coaching strategies	Used in observation	Used in plan review	Used during reflection and feedback	Notes
Observe				
Model				
Side-by-side support				
Video recording				
Problem-solving discussion				
Environmental arrangement				
Role-playing				

Next steps:

Follow-up to family:

E-mail Phone call Skype call

Material provision

Other Day/time for next session:

Focus for next session:

Appendix W: PTR Social Validity Form for Parents/Caregivers

PTR Self-Evaluation for Parents/Caregivers: Social Validity

Directions: Please score each item by selecting the number that best indicates how you feel about the PTR intervention(s).

1. How acceptable did you find the PTR programme?

1 2 3 4 5

Not at all acceptable

Neutral

Very acceptable

2. How willing were you to carry out this programme?

1 2 3 4 5

Not at all willing

Neutral

Very willing

3. Did you think there would be problems undertaking the PTR plan?

1 2 3 4 5

None

Neutral

Many

4. How much time did you need each day to carry out the PTR programme?

1 2 3 4 5

Little time will be needed

Neutral

Much time will be needed

5. How confident were you that the PTR programme has been effective for your child?

1 2 3 4 5

Not at all confident

Neutral

Very confident

6. How likely was the PTR programme in making permanent improvements in your child's behaviour?

1 2 3 4 5

Unlikely

Neutral

Very likely

7. How disruptive was carrying out the PTR programme to family life?

1 2 3 4 5

